



# TeSys

**Catalogue 2020**  
Innovative and connected  
solutions for motor starters



[se.com/tesys](https://se.com/tesys)

Life Is On

**Schneider**  
Electric



# Enter in your CATALOGUE

TeSys is an innovative motor control and management solution from the global market leader. TeSys offers connected, efficient products and solutions for switching and protection of motors and electrical loads in compliance with all major global electrical standards.



## ASSEMBLED MOTOR STARTERS

FULLY  
COORDINATED

**A1**

Enclosed switch-disconnectors  
and motor starters



Enclosed  
starters

**A2**

**TeSys**  
Open pre-cabled motor starters



Open  
pre-cabled  
motor  
starters

**A3**

**TeSys H**  
Ultra-compact starters



TeSys H

**A4**

**TeSys U**  
All-in-one motor starters



TeSys U

**A5**

**TeSys Integral 63**  
All-in-one motor starters



Integral 63

**A6**

Complementary technical information:  
coordination and standards

Coordination  
and  
standards



# COMPONENTS FOR CUSTOMER MADE SOLUTIONS

**B1****Linergy BZ, HK Busbar systems**Power  
busbar  
systems**B2****TeSys GV, LAD, U**

Motor starter wiring systems

Wiring  
systems**B3****TeSys Vario**

Switch-disconnectors

Switch-  
disconnectors**B4****TeSys DF, LS, GK**

Fuse carriers

Fuse  
carriers**B5****TeSys GS**

Switch-disconnector fuses

Switch-  
disconnectors  
fuses**B6****TeSys GB, GV**

Circuit breakers

Circuit  
breakers**B7****TeSys SK, K, D**

Control relays

Control  
relays**B8****TeSys D, SK, K, SKGC, GC, GY, GF**

Contactors



Contactors

**B9****TeSys F**

High power contactors

High power  
contactors**B10****TeSys B**

Bar mounted contactors

Bar mounted  
contactors**B11****TeSys LR, RM1X, LRD**

Overload relays

Overload  
relays

# COMPONENTS FOR MOTOR MANAGEMENT SYSTEMS

**C1****TeSys U, T**

Motor management

Motor  
management  
devices**C2****TeSys island**

Digital management

Control and  
monitoring  
island





# Start smart. Run smart. With TeSys motor controls.

Stay smart with the world's best-selling motor control solutions from the inventor of the world's first contactor - Schneider Electric™.

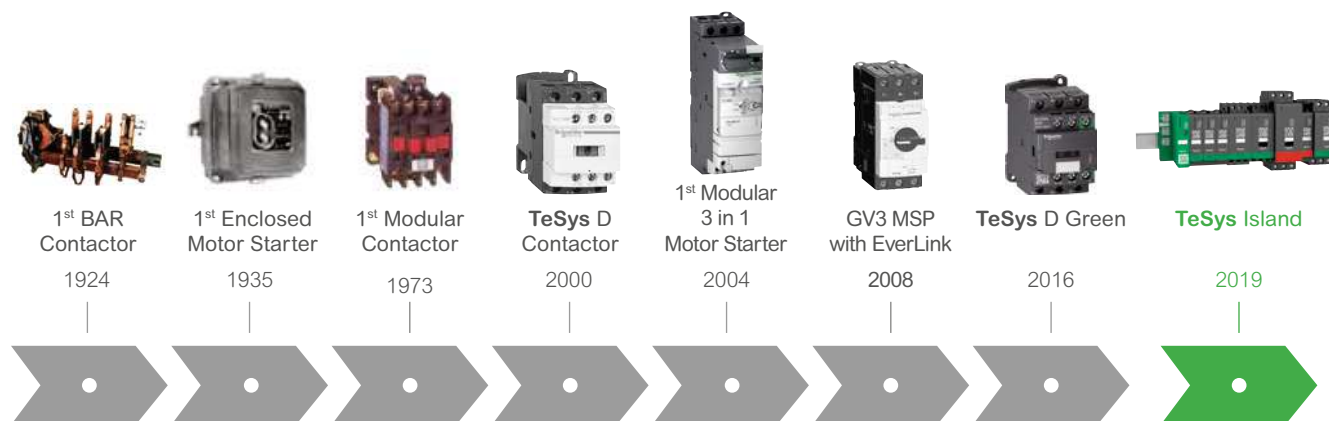
For almost a century, **TeSys** motor controls have driven the industry with innovations in motor protection, monitoring, and control.

It started with the introduction of the industry's first BAR contactor in 1924, and today, the legacy of innovation is built into every **TeSys** motor control device.

Best-in-class safety and reliability, plug-and-play architecture, and flexible functionality mean **TeSys** motor control solutions can meet your requirements across a wide range of applications, from the most common to the most advanced.

Wherever you are and anywhere your projects come together, you can trust Schneider Electric and **TeSys** contactors, circuit breakers, relays, and switches for unmatched reliability, complete compatibility with international standards, and the robust support of the Schneider Electric global supply network.

Start smart, run smart and stay smart with **TeSys** motor controls.





## Superior safety for all industries

TeSys motor controls come with all of the isolation, protection and emergency handling you need to comply with international codes. High-contrast covers identify safety-critical devices to prevent inadvertent manual operation. Every TeSys contactor is both mechanically linked and equipped with mirror contacts for safety applications and wherever auxiliary contact state reliability is critical.



### HVAC

Ensure 24/7 availability of your HVAC system with reliable products that can reach high ambient temperatures without derating.



### Conveying

Decentralize the control cabinet of your conveyor line and benefit from up to 80% space reduction.



### Genset

Make certain your generator starts even in the harshest conditions with robust TeSys solutions.



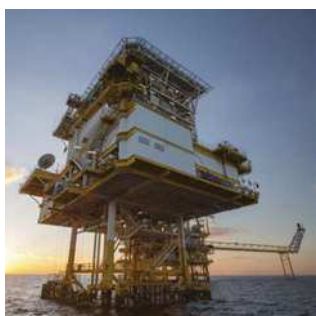
### Pumping

Optimize single or multi-drive boosters for industry or infrastructure with energy and cost-effective solutions.



### Packaging

Keep pace with the most demanding, high-end packing applications with solutions that can perform 30 million AC53a electrical cycles, like TeSys H.



### Oil and Gas

Keep your employees and assets safe and improve uptime in onshore and offshore applications: pipeline operations: LNG and natural gas processing: and refining and petrochemical applications.



### Water and Wastewater

Optimize the treatment and delivery of safer water by reducing energy usage and lowering operating costs.



### Food and Beverage

Serve your customers with environmentally friendly products to improve sustainability, efficiency, and flexibility, allowing you to adapt to changing customer habits.

## Online selection tool

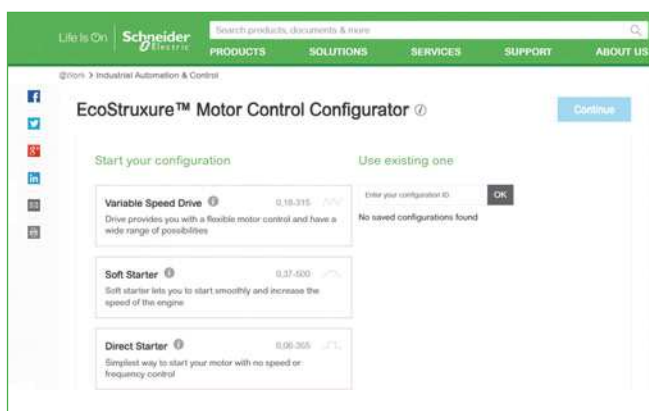
### EcoStruxure™ Motor Control Configurator

For Direct-On-Line and Star-Delta starters, motor circuit breakers with advanced protection, motor management relays, configurations for total coordination, drives, and soft starters.

No matter what kind of starting method you need, our online **EcoStruxure™ Motor Control Starter Configurator** will help you to quickly and easily select the optimal combination of components to ensure maximized motor safety, protection, and uptime.



Scan or click on the QR code







# Green Premium™

An industry leading portfolio of offers delivering sustainable value



More than 75% of our product sales offer superior transparency on the material content, regulatory information and environmental impact of our products:

- RoHS compliance
- REACH substance information
- Industry leading # of PEP's\*
- Circularity instructions



Discover what we  
mean by green  
**Check your products!**

The Green Premium program stands for our commitment to deliver customer valued sustainable performance. It has been upgraded with recognized environmental claims and extended to cover all offers including Products, Services and Solutions.

#### CO<sub>2</sub> and P&L impact through... Resource Performance

Green Premium brings improved resource efficiency throughout an asset's lifecycle. This includes efficient use of energy and natural resources, along with the minimization of CO<sub>2</sub> emissions.

#### Cost of ownership optimization through... Circular Performance

We're helping our customers optimize the total cost of ownership of their assets. To do this, we provide IoT-enabled solutions, as well as upgrade, repair, retrofit, and remanufacture services.

#### Peace of mind through... Well-being Performance

Green Premium products are RoHS and REACH compliant. We're going beyond regulatory compliance with step-by-step substitution of certain materials and substances from our products.

#### Improved sales through... Differentiation

Green Premium delivers strong value propositions through third-party labels and services. By collaborating with third-party organizations we can support our customers in meeting their sustainability goals such as green building certifications.

\*PEP: Product Environmental Profile (i.e. Environmental Product Declaration)



# Enter in your CATALOGUE ...AND EXPLORE MORE



**Colour images...**  
for a better reflection of the reality

Your products images are now printed in colour, depicting the realistic look and feel.

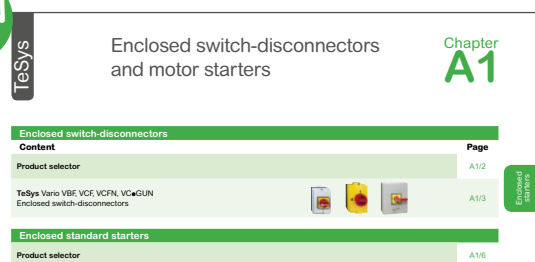
NEW



**Digital management**  
available in a new Part C, introducing **TeSys Island**

Complete details on TeSys Island from its dedicated catalog available as Hyperlink in **chapter C2**.

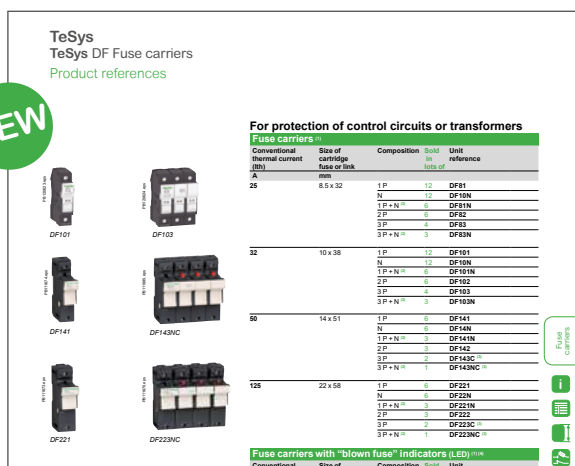
NEW



**Easier selection** in reorganized chapter A1  
'Enclosed switch-disconnectors and motors starters'

Products are presented in selection tables and described in details in dedicated pages.

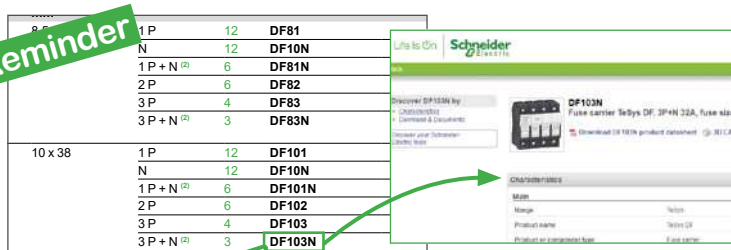
NEW



**Faster browsing** in each chapter thanks to tabs 'Introduction', 'Characteristics', 'Dimensions', 'Schemes'...

Click on to each hyperlink icons to quickly browse various sections of a given chapter.

Reminder



Click

**Quick access to online datasheets**  
thanks to hyperlink for references.

Click on to each product reference to get online product datasheet, product selectors...



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# Part A

## ASSEMBLED MOTOR STARTERS

FULLY  
COORDINATED

Enclosed switch-disconnectors  
and motor starters

From 0.25 to 40 kW



A1/1

Enclosed  
starters

**TeSys**

Open pre-cabled motor starters

From 0.06 to 315 kW



A2/1

Open  
pre-cabled  
motor  
starters

**TeSys H**

Ultra-compact starters

Up to 3 kW

From 9 A to 32 A



A3/1

TeSys H

**TeSys U**

All-in-one motor starters

From 0.09 to 18.5 kW



A4/1

TeSys U

**TeSys Integral 63**

All-in-one motor starter

Up to 32 kW

Up to 63 A



A5/1

Integral 63

Complementary technical  
information:

coordination and standards

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Coordination  
and  
standards







Enclosed switch-disconnectors		
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**Enclosed Motor Starter Solution Guide**

The software to help you to select intuitively  
your enclosed motor starter solution.

The new Enclosed Motor Starter Solution Guide  
software is available for both PC and iPad.





# TeSys

## TeSys Vario enclosed switch-disconnectors

### Introduction & selection table

Enclosed starters



#### Range of pre-assembled casings with handle and their rotary switch

They can be fixed on a wall, a panel, or on the chassis of a machine. For simple isolation and/or control of an electrical circuit. Red/yellow handle provides a clear indication of the device safety function <sup>(1)</sup>, while black handle is usually dedicated to ON/OFF control.

<sup>(1)</sup> Conforming to IEC 60947-4-1 and IEC 60204.

#### With numerous advantages to meet OEM's most common needs

- IEC or UL
- Multiple ratings and sizes
- IP65
- Additional poles
- Replaceable switch bodies

### Selection in 2 steps

- 1 Identify your need (1 line one or more) in the **Selection criteria** area (example.: Load 5 kW– Emergency Stop - IEC)

- 2 Choose your enclosed switch-disconnector in the **Solutions** area, note the radical of the product references

#### Selection criteria

Ithe (A)	Load power (kW)	Circuit isolation	Emergency stop	IP55	IP65	IEC	UL & CSA
10...140	4...45 (400 V)	●			●	●	
10...140	4...45 (400 V)	●	●		●	●	
10...32	4...15 (400 V)	●	●	●		●	
32...175 (Ithe IEC) 20...115 (Ith UL)	10...50 HP (480 V)	●	●		●	●	●

#### Solutions

VBF			
	VCF		
		VCFN	
			VC•GUN

See page

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A1/3

A1/4





VCF0GE



VCF3GE



VCF5GEN



VCFN12GE



VBF0GE



VBF6GEN

## Control + Disconnection (IEC)

Enclosed switch-disconnectors, ready to be fixed on workshop wall or directly on the machine and wired to main supply circuit and to load.

Functions / Range / Specificities:

- Direct Control: ON/OFF of 3-phase motor (black handle) or ON/Emergency Stop (red handle)
- 23 IEC motor starters, for 3P motors from 4 to 45 kW (10 to 140 A)
- 6 UL motor starters for 3P motors from 5 to 30 HP (240 V)
- Padlockable handle (1 to 3 padlocks – not included)
- Sealable, lockable cover when handle in position 1 (up to 63 A rating).

Included:

- rotary switch-disconnector body
- handle.

Enclosures for ON / Emergency Stop – IP65 – conforming IEC 60947-4-1 IEC 60204 <sup>(1)</sup>										
Operator		lthe	Power AC-23 at 400 V	Incorpor- ated switch body	Possible attach- ments <sup>(2)</sup>	With ground plate	Reference <sup>(3)</sup>	Weight	Overall dimensions <sup>(4)</sup> WxHxD	
Handle	Front plate Dim.									
	mm	A	kW					kg	mm	
Red, standard, padlockable with up to 3 padlocks (Ø 4 to Ø 8 shank)	Yellow 60 x 60	10	4	V02	2	No	VCF02GE	0.400	90x146x131	
						Yes	VCF02GEGP	0.460	90x146x131	
		16	5.5	V01	2	No	VCF01GE	0.400	90x146x131	
						Yes	VCF01GEGP	0.460	90x146x131	
		20	7.5	V0	2	No	VCF0GE	0.400	90x146x131	
						Yes	VCF0GEGP	0.460	90x146x131	
		25	11	V1	2	No	VCF1GE	0.400	90x146x131	
						Yes	VCF1GEGP	0.460	90x146x131	
		32	15	V2	2	No	VCF2GE	0.500	90x146x131	
		50	22	V3	3	No	VCF3GE	0.930	157x180x152	
Red, long, padlockable with up to 3 padlocks (Ø 4 to Ø 8 shanks)	Yellow 90 x 90	63	30	V4	3	No	VCF4GE	0.930	157x180x152	
		100	37	V5	1	No	VCF5GEN	2.190	241x291x190.5	
		140	45	V6	1	No	VCF6GEN	2.190	241x291x190.5	

Protection of sensitive equipment: ground plate available for VCF02GE...VCF1GE – see page A1/5.

Enclosures for ON / Emergency Stop – IP65 - conforming IEC 60947-4-1 <sup>(1)</sup>									
Operator	Handle	Front plate Dim.	lthe	Power AC-23 at 400 V	Incorporated switch body	Possible attachments <sup>(2)</sup>	Reference <sup>(3)</sup>	Weight	Overall dimensions <sup>(4)</sup>
		mm	A	kW				kg	mm
Red padlockable, either by 1 (Ø 8 shank) or by 3 padlocks (Ø 6 shank)		Yellow 60 x 60	10	4	VN12	2	VCFN12GE	0.422	82.5x131x106
			16	5.5	VN20	2	VCFN20GE	0.422	82.5x131x106
			20	7.5	V0	0	VCFN25GE	0.512	82.5x131x106
			25	11	V1	0	VCFN32GE	0.512	82.5x131x106
			32	15	V2	0	VCFN40GE	0.512	82.5x131x106

Enclosures for ON/OFF F– IP65 – conforming IEC 60947-4-1 IEC 60204 <sup>(1)</sup>									
Operator	Handle	Front plate Dim.	lthe	Power AC-23 at 400 V	Incorporated switch body	Possible attachments <sup>(2)</sup>	Reference <sup>(3)</sup>	Weight	Overall dimensions <sup>(4)</sup>
		mm	A	kW				kg	mm
Black, standard, padlockable with up to 3 padlocks (Ø 4 to Ø 8 shank)		Black 60 x 60	10	4	V02	2	VBF02GE	0.500	90x146x131
			16	5.5	V01	2	VBF01GE	0.500	90x146x131
			20	7.5	V0	2	VBF0GE	0.500	90x146x131
			25	11	V1	2	VBF1GE	0.500	90x146x131
			32	15	V2	2	VBF2GE	0.500	90x146x131
			50	22	V3	3	VBF3GE	0.930	90x146x131
			63	30	V4	3	VBF4GE	0.930	90x146x131
Black, long, padlockable with up to 3 padlocks (Ø 4 to Ø 8 shank)		Black 90 x 90	100	37	V5	1	VBF5GEN	2.190	241x291x190.5
			140	45	V6	1	VBF6GEN	2.190	241x291x190.5

<sup>(1)</sup> For characteristics of switch-disconnectors, please consult your Regional Sales Office.

<sup>(2)</sup> Number of add-on modules that can be attached.

<sup>(3)</sup> Enclosure not suitable in atmosphere contaminated with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

<sup>(4)</sup> Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

**Note:** For VCF and VBF enclosures from 02GE to 2GE, only one auxiliary contact block VZ7 or VZ20 can be mounted.





VC1GUN



VC3GUN



VC5GUN

## Control + Disconnection (UL)

### ON / Emergency Stop – IP65

Conforming UL508 CSA22.2 n° 14, IEC 60947-4-1, IEC 60204 <sup>(1)</sup>

Operator		Rating		Standard power ratings of UL motors			Incorporated switch body	Possible attachments	Reference <sup>(2)</sup>	Weight	Overall dimensions <sup>(1)</sup> WxHxD
Handle	Front plate Dim.	IEC (lth)	UL	600 V	240 V	480 V					
	mm	A	A	HP	HP	HP				kg	mm
Red, standard, padlockable with up to 3 padlocks (Ø 4 to Ø 8)	Yellow 60 x 60	32	20	5	10	10	V1	2	VC1GUN	0.500	121x164x132.1
		40	25	5	10	15	V2	2	VC2GUN	0.500	121x164x132.1
		63	45	10	20	30	V3	2	VC3GUN	0.930	164x193x132.1
		80	63	15	30	40	V4	2	VC4GUN	0.930	164x193x132.1
Red, long, padlockable with up to 3 padlocks (Ø 4 to Ø 8)	Yellow 90 x 90	125	100	25	50	50	V5	1	VC5GUN	2.190	241x291x190.5
		175	115	30	50	60	V6	1	VC6GUN	2.190	241x291x190.5

## Additional modules for Vario switch bodies

Enclosed switches include a Vario VZ switch body. Additional modules can be plugged on 1 or 2 sides of the switch body to provide additional contacts or extra connectivity.

### Common modules for enclosed switch disconnectors – with exceptions <sup>(3)</sup>

Description	Rating	Reference
Main pole module (mounted in enclosure)	A	
	10	VZ02 (not for VCxGUN starters)
	16	VZ01 (not for VCxGUN starters)
	20	VZ0 (not for VCxGUN starters)
	25	VZ1
	32	VZ2
	50	VZ3
	63	VZ4
Neutral pole modules with early make and late break contacts	10 to 32	VZ11
	50 and 63	VZ12
	100 and 140	VZ13
Earthing modules	10 to 32	VZ14
	50 and 63	VZ15
	100 and 140	VZ16
Description	Type of contacts	Reference
Auxiliary contact block modules with 2 auxiliary contacts	N/O + N/C <sup>(4)</sup>	VZ7
	N/O + N/O	VZ20

<sup>(1)</sup> For characteristics of switch-disconnectors, please consult your Regional Sales Office.

<sup>(2)</sup> Enclosure not suitable in atmosphere contaminated with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

<sup>(3)</sup> Not compatible with V●F5GEN, V●F6GEN, VC5GUN, VC6GUN, VCFN12GE, VCFN20GE.

<sup>(4)</sup> Late make N/O, early break N/C contacts.


VZ0  
Main pole

VZ11  
Neutral pole

VZ15  
Earthing terminal

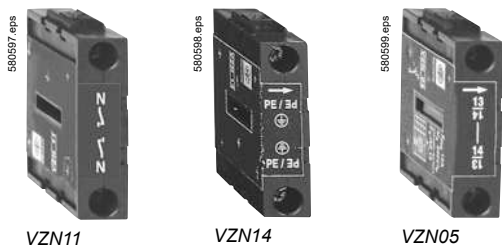
VZ20  
Auxiliary contacts



TeSys

TeSys Vario VCF enclosed switch-disconnectors / Ready-to-use - Additional modules - Accessories

Product references

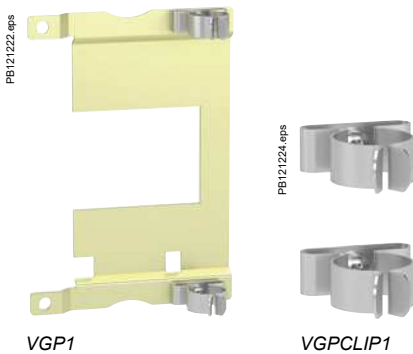


Additional modules for Vario switch bodies

Specific modules for VCFN12GE and VCFN20GE		
Description	Rating	Reference
Main pole modules	A	
	10	VZN12
	16	VZN20
Neutral pole module with early make and late break contacts	10 and 16	VZN11
Earthing module	10 and 16	VZN14

Description	Type of contacts	Reference
Auxiliary contact block modules	1 N/O late make contact	VZN05
	1 N/C early break contact	VZN06

Enclosed starters

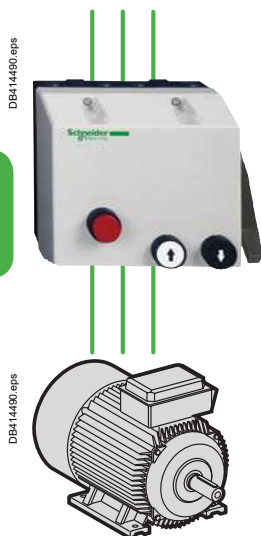


Accessories for Vario enclosed switch-disconnectors

Ground plate and accessories for VCF02GE, VCF01GE, VCF0GE, VCF1GE	
Metallic ground plate, for shielded cables connection. To be installed between back of Vario enclosed switch-disconnectors, 2 fixing screws. Cable shield grounding ensured by 2 clamps, clamping from Ø11 to 14 mm	
For switch body	Reference
Ground plate + 2 clamps + 2 screws	VGP1
2 clamps + 2 screws	VGPClip1







### Range of pre-assembled motor starters, with pushbuttons, selectors, protection and control components in a robust casing

They can be fixed on a wall, on a panel, or on the chassis of a machine. They provide an operator with an easy access with visual simplicity

#### Numerous advantages to meet OEM's most common needs

- IEC
- Multiple ratings and sizes
- IP55, IP65
- IK08, IK09
- Totally or partially pre-wired

#### Standard starters

They are used to isolate a circuit, to protect and/or to control a motor

#### Customized protection

TeSys enclosed starter offer is available in fully pre-equipped and pre-wired enclosures, also in partially pre-equipped enclosures to be completed with protective components of the required rating

#### Accessories

Additional accessories provide reinforced sealing, padlock locking, additional contacts...

### Selection in 2 steps

- 1 Identify your need (1 line one or more) in the **Selection criteria** area (example: Load 5 kW – ON/OFF control with overload protection)

- 2 Choose your starter in the **Solutions** area by adding column contents, note the radical of the product references (example: LE1D + LRD)

Selection criteria							Solutions				
Load Power (kW) / 400V	Circuit isolation	Direct starter - ON/OFF	Reverser ON/REVERSE/OFF	Short circuit protection	Overload protection	Star - delta	Protection device to be added by customer (of appropriate rating)				
0.25...7.5		•			•		LE1M35				LE1D
4 ... 30		•			•						GV2L
0.02... 30		•		•							GV2P
0.02... 30		•		•							GV2ME
0.06... 11		•		•	•						LE4K
2.2 ... 15		•		•	•						LE2K
2.2 ... 30		•	•	•	•						LE8K
2.2 ... 15		•	•	•	•						LE3D
7.5...30		•	•	•	•	•					LE6D
7.5...18.5		•	•	•	•	•					





LE1M35●●●●

### Control + Protection against Overloads

- Direct Control: ON/OFF of 3-phase motor
- Motor protection: motor OFF in case of overload – manual reset with the red pushbutton.
- Indication: yellow light activated with the contactor coil.
- The LE1M35 starter, combined with short-circuit protection components, provides type 1 or type 2 coordination, depending on the type of devices used.

#### Range:

- 10 IEC motor starters, for 3P motors from 0.25 to 7.5 kW (400V AC)
- Configurable pushbuttons: impulse or latched
- Conforming to IEC 60947-4-1 standard
- Degree of protection IP65, according IEC 60529
- Ambient air temperature in operation -5 to +40°C
- Operating position: same as TeSys K series contactors
- Material: self extinguishing ABS.

#### Included (standard version):

- 1 TeSys contactor LC1 K●●<sup>(1)</sup>
- 1 TeSys thermal overload relay LR2 K<sup>(2)</sup>
- 1 green Start button "I",
- 1 red Stop/Reset button "O/R",
- 1 yellow operating indicator
- earth + neutral terminals at bottom of enclosure.

For supply voltages between 380 and 440 V (codes Q7, V7, N7 or R7) the control circuit is pre-wired between phases. For other supply voltages, the control circuit must be wired by the customer.

### Direct-on-line starters

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3				Setting range of thermal overload relay LR2K	Basic reference, to be completed by adding the voltage code <sup>(3)</sup>	Overall dimensions <sup>(4)</sup> WxHxD
220 V	240 V	380 V	415 V			
230 V		400 V				
kW	kW	kW	kW	A		mm
0.12	0.12	0.25	0.25	0.54...0.8	LE1M35●●05	78x160x108
0.18	0.18	0.37	0.37	0.8...1.2	LE1M35●●06	78x160x108
0.25	0.25	0.55	0.55	1.2...1.8	LE1M35●●07	78x160x108
0.37	0.37	1.1	0.75	1.8...2.6	LE1M35●●08	78x160x108
0.55	0.55	1.5	1.5	2.6...3.7	LE1M35●●10	78x160x108
1.1	0.75	2.2	2.2	3.7...5.5	LE1M35●●12	78x160x108
1.5	1.1	3	3	5.5...8	LE1M35●●14	78x160x108
2.2	2.2	4	4	8...11.5	LE1M35●●16	78x160x108
3	3	5.5	5.5	10...14	LE1M35●●21	78x160x108
3.7	4	7.5	7.5	12...16	LE1M35●●22	78x160x108
Replacement contactor					LC1K●●A80	-

### Coil voltage codes

Volts ~ 50/60 Hz	24	110	220	230	240	380	400	415	440
Code	B7	F7	M7	P7	U7	Q7	V7	N7	R7

<sup>(1)</sup> TeSys K contactor characteristic: refer to chapter B8.

<sup>(2)</sup> TeSys LR2K overload relay characteristics: refer to chapter B11.

<sup>(3)</sup> Remove the 2 last numbers if the thermal overload relay is not required.

Example: LE1M35B7 instead of L1M35B714.

<sup>(4)</sup> Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.







## Control + Protection against Overloads

- ON/OFF motor starters: 1-way rotation control of 3-phase motor, by green & red pushbuttons
- Motor protection against overload: manual reset with the red pushbutton or remotely.

Range:

- 8 direct-on-line starters for 3P motors from 4 to 30 kW (9 to 65 A AC-3)
- Choice of up to 12 AC coil voltages for control supply circuit (depending on starter rating).

Enclosures characteristics:

- Conforming to IEC 60947-4-1 standard
- Degree of protection according IEC 60529:
  - IP65,
  - IK07 for LE1D09...D35,
  - IK09 for LE1D40A...D65A
- Ambient air temperature in operation -5 to +40°C
- Operating position: same that as contactors
- Material: LE1D09... D35 polycarbonate <sup>(2)</sup>
- LE●D40A... D65A steel sheet.

Included:

- 1 pre-wired LC1D contactor
- 2 Harmony XB5 pushbuttons.

An LRD overload relay of the required rating must be ordered separately and wired at bottom of the contactor.

### Direct on-line starters

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3						Max. current	Basic reference, to be completed by adding the voltage code	Weight	Overall dimensions <sup>(3)</sup>
220 V	380 V	415 V	440 V	500 V	660 V	690 V			
kW	kW	kW	kW	kW	kW	A		kg	mm
2.2	4	4	4	5.5	5.5	9	LE1D09●●	0.920	88x166x128.5
3	5.5	5.5	5.5	7.5	7.5	12	LE1D12●●	0.920	88x166x128.5
4	7.5	9	9	10	10	18	LE1D18●●	1.015	101x201x153.5
5.5	11	11	11	15	15	25	LE1D25●●	1.015	101x201x153.5
7.5	15	15	15	18.5	18.5	35	LE1D35●●	4.320	101x201x153.5
11	18.5	22	22	22	30	40	LE1D40A●●	4.820	200x300x158.5
15	22	25	30	30	33	50	LE1D50A●●	4.850	200x300x158.5
18.5	30	37	37	37	37	65	LE1D65A●●	4.850	200x300x158.5

### Variants (pre-assembled)

Description	Available variants for starter	Suffix to be added to the starter reference <sup>(4)</sup>
No pushbuttons on cover	LE1D09...D65A●●	A04
1 blue Reset button "R"	LE1D09...D65A●●	A05
1 3-position stay put selector switch ("I"- "O"- "II") ("I": Automatic Start; "O": Stop; "II": Manual Start) 1 blue Reset button "R"	LE1D09...D25●●	A09
1 2-position stay put selector switch "O"- "I" ("O": Stop; "I": Manual Start) 1 blue Reset button "R"	LE1D09...D25●●	A13
Mounting of an LC1D09 contactor in an enclosure identical to LE1D18	LE1D09P7 LE1D09P7A13	T

### Coil voltage codes <sup>(4)</sup>

Volts	24	48	110	115	120	220	230	240	380	400	415	440
~ 50/60 Hz												
LE1D09 to D35	B7	E7	F7	FE7	G7	M7	P7	U7	Q7	V7	N7	R7
LE1D40A to D65A	-	-	-	FE7	-	-	P7	-	Q7	-	-	-

<sup>(1)</sup> TeSys LRD overload relay selection: product reference page A1/33, more details in chapter B11.

<sup>(2)</sup> Avoid placing this material in contact with harsh substances (detergents, chlorine solvents ketones, alcohol, aromatic hydrocarbons).

<sup>(3)</sup> Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

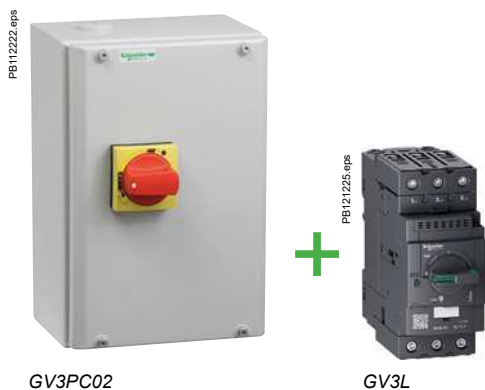
<sup>(4)</sup> Some combinations of variants / control voltage may not be available. Please consult us.





GV2PC01

GV2L



GV3PC02

GV3L

### Control + Isolation + Protection against Short circuits

2 solutions according to the required current rating.

GV2PC + GV2L > up to 23 A (Ithe)

GV3PC + GV3L > up to 55 A (Ithe)

The GV2L or GV3L circuit breaker of the required rating must be ordered separately.

- Circuit isolation
- ON/OFF motor starters: 1-way rotation control of 3-phase motor
- Padlocking:
  - in ON or OFF position (PGV2PC01, GV3PC01),
  - in OFF position (GV2PC02, GV3PC02).

Suitable circuit breakers:

- GV2L - 12 ratings (3P motors from 0.09 to 11 kW - 400/415 V AC)
- GV3L - 3 ratings (3P motors from 18.5 to 30 kW - 400/415 V AC).

Enclosures characteristics:

- Conforming to IEC 60947-2
- Degree of protection according IEC 60529:
  - IP65, IK08 (for GV2PC),
  - IK09 (for GV3PC)
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue): 690V
- Material: GV2PC polycarbonate <sup>(2)</sup>, GV3PC steel sheet.

Included:

- GV rotary handle.

### Enclosures fitted with padlockable rotary handle

Composition	Type	Reference	Overall dimensions <sup>(3)</sup> WxHxD mm
<ul style="list-style-type: none"> <li>■ Insulating enclosure</li> <li>■ Black handle, padlockable in ON/OFF position</li> </ul>	Surface mounting For GV2L	<b>GV2PC01</b>	88x166x163
<ul style="list-style-type: none"> <li>■ Insulating enclosure</li> <li>■ Red handle on yellow background, padlockable in OFF position</li> </ul>	Surface mounting For GV2L	<b>GV2PC02</b>	88x166x163
<ul style="list-style-type: none"> <li>■ Metal enclosure</li> <li>■ Black handle, padlocking in ON/OFF position</li> <li>■ Circuit breaker/handle adapter</li> </ul>	Surface mounting For GV3L	<b>GV3PC01</b>	200x300x200
<ul style="list-style-type: none"> <li>■ Metal enclosure</li> <li>■ Red handle, padlocking in OFF position</li> <li>■ Circuit breaker/handle adapter</li> </ul>	Surface mounting For GV3L	<b>GV3PC02</b>	200x300x200

### GV2L, GV3L product references: add code to product reference <sup>(4)</sup>

Ithe (A)	0.4	0.63	1	1.6	2.5	4	6.3	9	13	17	21	23
GV2L codes	03	04	05	06	07	08	10	14	16	20	21	22
Ithe (A)	35	41	55									
GV3L codes	40	50	65									

<sup>(1)</sup> TeSys GV2, GV3 circuit breaker not included - characteristics: refer to chapter B6.

<sup>(2)</sup> Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

<sup>(3)</sup> Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

<sup>(4)</sup> Example: for Ithe 17 A, magnetic circuit breaker is GV2L20.





GV2PC01



GV2P



GV3PC02



GV3P



## Control + Isolation + Protection against Short circuits and Overloads

For OEM, 2 solutions according to the required current rating.

GV2PC + GV2P > up to 23 A (Ithe)

GV3PC + GV3P > up to 55 A (Ithe)

The enclosure includes a rotary handle. The GV2P or GV3P circuit breaker of the required rating must be ordered separately.

- Circuit isolation
- ON/OFF motor starters: 1-way rotation control of 3-phase motor
- Padlocking:
  - in ON or OFF position (GV2PC01, GV3PC01),
  - in OFF position (GV2PC02, GV3PC02).

Suitable circuit breakers:

- GV2P - 14 ratings (3P motors from 0.06 to 11 kW - 400/415 V AC)
- GV3P - 2 ratings (3P motors from 18.5 to 30 kW - 400/415 V AC).

Enclosures characteristics:

- Conforming to IEC 60947-2
- Degree of protection according IEC 60529: IP65, IK08 (for GV2PC), IK09 (for GV3PC)
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue) 690V
- Material: GV2PC polycarbonate <sup>(2)</sup>, GV3PC steel sheet.

Included:

- GV rotary handle.

### Enclosures fitted with padlockable rotary handle

Composition	Type	Reference	Overall dimensions <sup>(3)</sup> WxHxD mm
<ul style="list-style-type: none"> <li>■ Insulating enclosure</li> <li>■ Black handle, padlockable in ON/OFF position</li> </ul>	Surface mounting For GV2L	<b>GV2PC01</b>	88x166x163
<ul style="list-style-type: none"> <li>■ Insulating enclosure</li> <li>■ Red handle on yellow background, padlockable in OFF position</li> </ul>	Surface mounting For GV2L	<b>GV2PC02</b>	88x166x163
<ul style="list-style-type: none"> <li>■ Metal enclosure</li> <li>■ Black handle, padlocking in ON/OFF position</li> <li>■ Circuit breaker/handle adapter</li> </ul>	Surface mounting For GV3L	<b>GV3PC01</b>	200x300x200
<ul style="list-style-type: none"> <li>■ Metal enclosure</li> <li>■ Red handle, padlocking in OFF position</li> <li>■ Circuit breaker/handle adapter</li> </ul>	Surface mounting For GV3L	<b>GV3PC02</b>	200x300x200

### GV2P, GV3P product references: add code to product reference <sup>(4)</sup>

Ithe (A)	0.16	0.25	0.4	0.63	1	1.6	2.5	4	6.3	9	13	17	21	23
GV2P codes	01	02	03	04	05	06	07	08	10	14	16	20	21	22
Ithe (A)	35	41	55											
GV3P codes	40	50	65											

<sup>(1)</sup> TeSys GV2, GV3 circuit breaker not included - characteristics: refer to chapter B6.

<sup>(2)</sup> Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

<sup>(3)</sup> Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

<sup>(4)</sup> Example: for Ithe 17 A, magnetic circuit breaker is GV2P20.





GV2MC02, GV2MC03

GV2ME



GV2MP01, GV2MP02

GV2ME

## Control + Isolation + Protection against Short circuits and Overloads

For OEM, 2 solutions, according to the enclosure installation mode:

GV2MC surface mounting enclosure for GV2ME circuit breaker

GV2MP flush mounting enclosure for GV2ME circuit breaker.

The GV2ME circuit breaker of the required rating must be ordered separately.

- Circuit isolation
- ON/OFF motor starters: 1-way rotation control of 3-phase motor
- Short-circuit and adjustable overload protection
- Padlocking in OFF position.

Suitable circuit breakers:

- GV2ME - 14 ratings (3P motors from 0.06 to 11 kW - 400/415 V AC).

Enclosures characteristics:

- Conforming to IEC 60947-2; IEC 60947-4-1
- Degree of protection according IEC 60529: refer to selection chart
- Operational voltage (Ue) 690 V
- Material: polycarbonate <sup>(2)</sup>.

Included:

- GV2E01 or GV2E02 sealing kit (fixed on the front plate).

### Enclosures for thermal-magnetic circuit breakers GV2 ME

Type	Degree of protection	Possible no. of side mounting auxiliary contact blocks on GV2ME		Reference	Weight kg	Overall dimensions <sup>(3)</sup> WxHxD mm
		LH side	RH side			
Surface mounting, double insulated with protective conductor. Sealable cover	IP41	1	1	GV2MC01	0.290	93x147x84
	IP55	1	1	GV2MC02 or GV2MCK04 <sup>(4)</sup>	0.300 0.420	93x147x84 93x147x145.5
	IP55 for temperature < +5 °C	1	1	GV2MC03	0.300	93x147x84
Flush mounting, with protective conductor	IP41 (front face)	1	1	GV2MP01	0.115	106.5x140x83
	IP41 (front face – reduced flush mounting)		1	GV2MP03	0.115	106.5x140x98
	IP55 (front face)	1	1	GV2MP02	0.130	106.5x140x83
	IP55 (front face – reduced flush mounting)		1	GV2MP04	0.130	106.5x140x98

**GV2ME product references:** add code to product reference <sup>(5)</sup>

lthe (A)	0.16	0.25	0.4	0.63	1	1.6	2.5	4	6.3	9	13	17	21	23
GV2ME codes	01	02	03	04	05	06	07	08	10	14	16	20	21	22

**GV2MC, GV2MP enclosures with complementary circuit breaker and mushroom head pushbutton allow the construction of safety direct-on-line starters conforming INRS and VDE0113.**

Surface and flush mounting enclosures, mushroom heads, circuit breakers and undervoltage release cover a large number of applications.

<sup>(1)</sup> Characteristics of TeSys **GV2ME** circuit breakers and additives: refer to page A1/32.

<sup>(2)</sup> Enclosure not suitable in atmosphere contaminated with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

<sup>(3)</sup> Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light

<sup>(4)</sup> Enclosure **GV2MCK04** is fitted with a **GV2K04** mushroom head Emergency stop pushbutton as standard.

<sup>(5)</sup> Example: for lthe 17 A, magnetic circuit breaker is **GV2ME20**.







LE4K●●●●



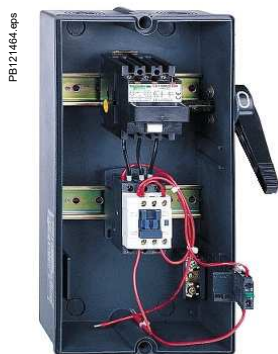
LR2K●●



LE4D●●●●



LRD●●



LE4D●●●●

## Control + Isolation + Protection against Short circuits and Overloads

- ON/OFF motor starters: 1-way rotation control of 3-phase motor, by green & red pushbuttons
- Option: no pushbutton on cover
- Circuit disconnection by side black handle
- Protection against short circuits by NFC fuses type aM (to be ordered separately)
- Motor protection against overload – manual reset with the red pushbutton or remotely. Option: cover with just a “Reset” blue pushbutton.
- An LR2K or LRD overload relay of the required rating must be ordered separately and wired at bottom of the contactor <sup>(1)</sup>.

### Ranges:

- 8 partially pre-equipped enclosures to build-up 3P motor starters from 2.2 to 15 kW (6 to 35 AAC-3)
- Choice of 5 coils for LE4K●●, 12 coils for LE4D●●, for control with different AC voltages.

### Enclosures characteristics:

- Conforming to IEC 60947-4-1 standard
- Degree of protection according IEC 60529:
  - IP65, IK09 for LE4KIP65,
  - IK07 for LE4D,
- Ambient air temperature in operation -5 to +40°C
- Operating position: same that as contactors
- Material: LE4K and LE4D polycarbonate <sup>(2)</sup>.

### Included:

- 1 fuse carrier with external side handle
- 1 pre-wired LC1K or LC1D contactor
- 2 Harmony XB5 pushbuttons.

## Direct-on-line starters

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3							Max. current I <sub>th</sub> up to	Fuses to be fitted by the customer	Basic reference, to be completed by adding the voltage code <sup>(3) (4)</sup>		Weight	Overall dimensions <sup>(5)</sup> WxHxD
220 V	380 V	415 V	440 V	500 V	660 V	690 V	A	Size	Type aM	code <sup>(3) (4)</sup>	kg	mm
1.5	2.2	2.2	3	–	–	–	6	10 x 38	10	LE4K065●●	1.450	206x165x146
2.2	4	4	4	–	–	–	9	10 x 38	12	LE4K095●●	1.450	206x165x146
										or LE4D09●● <sup>(6)</sup>	1.960	217x348x175.5
2.2	4	4	4	5.5	–	–	9	10 x 38	12	LE4D09●●	1.960	217x348x175.5
3	5.5	5.5	5.5	7.5	–	–	12	10 x 38	16	LE4D12●●	1.960	217x348x175.5
4	7.5	9	9	10	–	–	18	10 x 38	20	LE4D18●●	2.200	217x348x175.5
5.5	11	11	11	15	–	–	25	10 x 38	25	LE4D25●●	2.200	217x348x175.5
7.5	15	15	15	18.5	18.5	–	35	14 x 51	32	LE4D35●●	5.190	217x348x175.5

### Voltages code <sup>(4)</sup>

Volts	24	48	110	115	120	220	230	240	380	400	415	440
~ 50/60 Hz												
LE4D	B7	E7	F7	FE7	G7	M7	P7	U7	Q7	V7	N7	R7
LE4K	–	–	–	–	–	M7	P7	U7	Q7	V7	–	–

Supply voltages between 380 and 440 V (codes Q7, V7, N7 or R7): pre-wired control circuit between phases.

Other supply voltages: control circuit must be wired by the customer.

<sup>(1)</sup> TeSys LR2K, LRD overload relay selection: product references page A1/33, more details in chapter B11.

<sup>(2)</sup> Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

<sup>(3)</sup> LE4D●●● (with P7 and V7 coil) with no pushbutton on cover: add “A04” to product reference (example: LE4D25V7A04).

LE4D●●● (with P7 and V7 coil) with overload “Reset” blue pushbutton only on cover: > add “A05” to full product reference.

<sup>(4)</sup> Some combinations of variants / control voltage may not be available. Please consult us.

<sup>(5)</sup> Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

<sup>(6)</sup> Selection according to dimensions and the number of operating cycles, please consult your Regional Sales Office.





### Reverse Control + Isolation + Protection against Overloads

- ON/REVERSE/OFF motor starters: 2-way rotation control of 3-phase motor
    - by black I-II position spring return selector, red STOP/RESET pushbuttons for LE2K... starters
    - by black ON ↑, ON ↓ pushbuttons, red STOP/RESET pushbutton for LE2D... starters
  - Motor protection against overload: manual reset with the red pushbutton or remotely.
- An LR2K or LRD overload relay of the required rating must be ordered separately and wired at bottom of the contactor.

#### Ranges:

- for 3P motors from 4 to 30 kW (9 to 65 A AC-3), in 11 ranges of reverser starters
- Choice of up to 7 AC coils voltages (depending on starter) for control supply circuit.

#### Enclosures characteristics:

- Conforming to IEC 60947-4-1 standard
- Degree of protection according IEC 60529: IP65, IK07 for LE2D09...D35, IK09 for LE2K and LE2D40A...D65A,
- Ambient air temperature in operation -5 to +40°C
- Operating position: same that as contactors
- Material: LE2K and LE2D09...D35 polycarbonate <sup>(2)</sup>
- LE2D40A...D65A steel sheet.

#### Included:

- 2 pre-wired LC1K or LC1D contactor
- 3 Harmony XB5 pushbuttons - or -1 Harmony XB5 pushbutton + 1 Harmony XB5 switch.

### Reversing starters

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3							Maximum current I the up to	Basic reference, to be completed by adding the voltage code <sup>(3)</sup>	Weight	Overall dimensions <sup>(4)</sup> WxHxD
220 V	380 V	415 V	440 V	500 V	660 V	690 V				
230 V	400 V						A		kg	
1.5	2.2	2.2	3	—	—	—	6	LE2K065...	1.080	175x165x146
2.2	4	4	4	—	—	—	9	LE2K095...	1.080	175x165x146
—	—	—	—	5.5	5.5	—	9	LE2D09... <sup>(5)</sup>	2.100	101x201x153.5
—	—	—	—	5.5	5.5	—	9	LE2D09...	2.100	101x201x153.5
3	5.5	5.5	5.5	7.5	7.5	—	12	LE2D12...	2.100	101x201x153.5
4	7.5	9	9	10	10	—	18	LE2D18...	2.410	101x201x153.5
5.5	11	11	11	15	15	—	25	LE2D25...	2.570	101x201x153.5
7.5	15	15	15	18.5	18.5	—	35	LE2D35...	4.100	101x201x153.5
11	18.5	22	22	22	30	—	40	LE2D40A...	5.270	200x300x174
15	22	25	30	30	33	—	50	LE2D50A...	5.470	200x300x174
18.5	30	37	37	37	37	—	65	LE2D65A...	5.470	200x300x174

#### Coil voltage codes <sup>(3)</sup>

Volts ~ 50/60 Hz	24	48	110	115	120	220	230	240	380	400	415	440
LE2D40A to D65A	—	—	—	FE7	—	—	P7	—	Q7	—	—	—
LE2D09 to D35	B7	—	—	—	—	M7	P7	U7	Q7	V7	N7	—
LE2K	—	—	—	—	—	M7	P7	U7	Q7	V7	—	—

<sup>(1)</sup> TeSys LR2K, LRD overload relay selection: product references page A1/33, more details in chapter B11.

<sup>(2)</sup> Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

<sup>(3)</sup> Some combinations of variants / control voltage may not be available. Please consult us.

<sup>(4)</sup> Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

<sup>(5)</sup> Selection according to dimensions and the number of operating cycles, please consult your Regional Sales Office.





LE8K●●●●



LR2K●●



LE8D●●●●



LRD●●



LE8D●●●●

## Reverse Control + Isolation + Protection against Short circuits and Overloads

- ON/REVERSE/OFF motor starters: 2-way rotation control of 3-phase motor
  - LE8K●● starters, by white ↑, black ↓, red Stop/Reset pushbuttons
  - LE8D●● starters, by black I-II position spring return selector, red Stop/Reset pushbutton
  - Option: no pushbutton on cover
  - Circuit disconnection by side black handle
  - Protection against short circuits by NFC fuses type aM (to be ordered separately)
  - Motor protection against overload: manual reset with the red pushbutton or remotely. LE8D option: cover with just a "Reset" blue pushbutton.
- An LR2K or LRD overload relay of the required rating must be ordered separately and wired at bottom of a the contactor.

### Ranges:

- 8 partially pre-equipped enclosures to build-up 3P motor reversers from 2.2 to 15 kW (6 to 35 A AC-3)
- Choice of 3 coils for control with different AC voltages.

### Enclosures characteristics:

- Conforming to IEC 60947-4-1 standard
- Degree of protection according IEC 60529: IP65, IK09 for LE8KIP65, IK07 for LE8D
- Ambient air temperature in operation -5 to +40°C
- Operating position: same that as contactors
- Material: LE8K and LE8D09●●●D35 polycarbonate <sup>(2)</sup>.

### Included:

- 1 fuse carrier with external side handle
- 2 pre-wired LC1K or LC1D contactors
- 3 Harmony XB5 pushbuttons - or -1 Harmony XB5 pushbutton + 1 Harmony XB5 switch.

## Reversing starters

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3							Maximum current I <sub>b</sub> the up to	Fuses to be fitted by the customer		Basic reference, to be completed by adding the voltage code <sup>(3) (4)</sup>	Weight	Overall dimensions <sup>(5)</sup> WxHxD
220 V	380 V	415 V	440 V	500 V	660 V	690 V		Size	Type aM			
kW	kW	kW	kW	kW	kW	kW	A		A		kg	
1.5	2.2	2.2	3	—	—	—	6	10 x 38	10	LE8K065●●	1.600	206x165x146
2.2	4	4	4	—	—	—	9	10 x 38	12	LE8K095●●	1.600	206x165x146
—	—	—	—	5.5	—	—	9	10 x 38	12	or LE8D09●● <sup>(6)</sup>	3.550	217x348x182
—	—	—	—	5.5	—	—	9	10 x 38	12	LE8D09●●	3.550	217x348x182
3	5.5	5.5	5.5	7.5	—	—	12	10 x 38	16	LE8D12●●	3.550	217x348x182
4	7.5	9	9	10	—	—	18	10 x 38	20	LE8D18●●	3.700	217x348x182
5.5	11	11	11	15	—	—	25	10 x 38	25	LE8D25●●	4.670	217x348x182
7.5	15	15	15	18.5	18.5	—	35	14 x 51	32	LE8D35●●	5.800	217x348x182

### Voltage codes <sup>(4)</sup>

Volts	24	48	110	115	120	220	230	240	380	400	415	440
~ 50/60 Hz												
LE8 K, LE8 D	—	—	—	—	—	—	P7	—	Q7	V7	—	—

<sup>(1)</sup> TeSys LR2K, LRD overload relay selection: product references page A1/33, more details in chapter B11.

<sup>(2)</sup> Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

<sup>(3)</sup> LE8K●●●●, LE8D●●●● (with P7 and V7 coil) with no pushbutton on cover: add "A04" to product reference (example: LE8K095P7A04, LE8D25V7A04) LE4D●●●● (with P7 and V7 coil) with only one pushbutton on cover: overload "Reset" blue pushbutton > add "A05" to full product reference.

<sup>(4)</sup> Some combinations of variants / control voltage may not be available. Please consult us.

<sup>(5)</sup> Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

<sup>(6)</sup> Selection according to dimensions and the number of operating cycles, please consult your Regional Sales Office.





LE3D



LRD●●



LE3D

### Star-delta Control + Protection against Overload

- Star-delta starting of 3-phase motor: ON by green pushbutton, OFF by red pushbutton. Option: no pushbutton on cover
- Maximum operating rate: 30 starts/hour.
- Maximum starting time: 30 seconds.
- Delay of 40 ms ±15 ms at changeover by LAD S2 timer on delta contactor to provide sufficient time for star contactor to break.
- Motor protection against overload: manual reset with the red pushbutton or remotely.

An LRD overload relay of the required rating must be ordered separately and wired at bottom of the contactor.

#### Range:

- 4 partially pre-equipped enclosures to build-up 3P motor starters from 7.5 to 30 kW.
- Choice of 7 coils for control with different AC voltages.

#### Enclosures characteristics:

- Conforming to IEC 60947-4-1 standard
- Degree of protection according IEC 60529: IP65, IK07
- Ambient air temperature in operation -5 to +40°C
- Operating position: same that as contactors
- Material: polycarbonate <sup>(2)</sup>.

#### Included:

- 3 pre-wired LC1D contactors
- 2 Harmony XB5 pushbuttons.

### Star-delta starters

Standard power ratings of squirrel cage motors Mains voltage - delta connection				Basic reference, to be completed by adding the voltage code <sup>(3)</sup> <sup>(4)</sup>	Weight kg	Overall dimensions <sup>(5)</sup> WxHxD
220 V	380/400 V	415 V	440 V			
kW	kW	kW	kW			
4	7.5	7.5	7.5	LE3D09●●	3.650	186x348x175.5
5.5	11	11	11	LE3D12●●	3.650	186x348x175.5
11	18.5	22	22	LE3D18●●	3.750	186x348x175.5
15	30	30	30	LE3D35●●	5.160	186x348x175.5

#### Voltage codes <sup>(4)</sup>

Volts ~ 50/60 Hz	24	220	230	240	380	400	415
LE3 D	B7	M7	P7	U7	Q7	V7	N7

<sup>(1)</sup> TeSys LRD overload relay selection: product references page A1/33, more details in chapter B11 - Select appropriate overload relay for setting at 0.58 of the full load rated motor current.

<sup>(2)</sup> Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

<sup>(3)</sup> LE3D●●●● (with P7 and V7 coil) with no pushbutton on cover: add "A04" to product reference (example: LE3D18P7A04).

<sup>(4)</sup> Some combinations of variants / control voltage may not be available. Please consult us.

<sup>(5)</sup> Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.





LE6D●●●●



LRD●●

### Star-delta Control + Disconnection + Protection against Short circuits and Overloads

- Star-delta starting of 3-phase motor: ON by green pushbutton, OFF by red pushbutton. Options: no pushbutton, "Reset" pushbutton only
- Maximum operating rate: 30 starts/hour.
- Maximum starting time: 30 seconds.
- Delay of 40 ms ±15 ms at changeover by LAD S2 timer on delta contactor to provide sufficient time for star contactor to break.
- Circuit disconnection by side black handle
- Protection against short circuits by NFC fuses type aM (to be ordered separately)
- Motor protection against overload: manual reset with the red pushbutton or remotely.

An LRD overload relay of the required rating must be ordered separately and wired at bottom of the contactor.

#### Range:

- 4 partially pre-equipped enclosures to build-up 3P motor starters from 7.5 to 30 kW choice of 7 coils for control with different AC voltages.

#### Enclosures characteristics:

- Conforming to IEC 60947-4-1 standard
- Degree of protection according IEC 60529: IP65, IK07
- Ambient air temperature in operation -5 to +40°C
- Operating position: same that as contactors
- Material: polycarbonate <sup>(2)</sup>.

#### Included:

- 1 fuse carrier with external side handle
- 3 pre-wired LC1D contactors
- 2 Harmony XB5 pushbuttons.

### Star-delta starters

Standard power ratings of squirrel cage motors				Fuses to be fitted by the customer		Basic reference, to be completed by adding the voltage code <sup>(3)</sup>	Weight	Overall dimensions <sup>(4)</sup> WxHxD
Mains voltage - delta connection				Size	Type			
220 V	380/400 V	415 V	440 V		aM			
kW	kW	kW	kW				kg	
4	7.5	7.5	7.5	10 x 38	20	LE6D09●●	3.900	217x348x175.5
5.5	11	11	11	10 x 38	25	LE6D12●●	3.900	217x348x175.5
11	18.5	22	22	14 x 51	40	LE6D18●●	4.850	217x348x175.5

Voltage codes			
Volts ~ 50/60 Hz	24	230	400
LE6 D	B7	P7	V7

<sup>(1)</sup> TeSys LRD overload relay selection: product references page A1/33, more details in chapter B11 - Select appropriate overload relay for setting at 0.58 of the full load rated motor current.

<sup>(2)</sup> Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

<sup>(3)</sup> Some combinations of variants / control voltage may not be available. Please consult us.

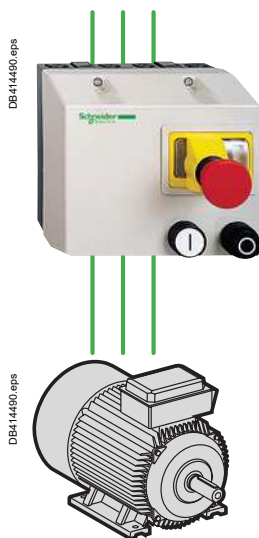
<sup>(4)</sup> Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.



# TeSys

## TeSys enclosed safety starters

### Introduction & selection table



Range of pre-assembled safety motor starters, with mushroom pushbuttons, protection and control components in a robust casing

They can be fixed on a wall, on a panel, or on the chassis of a machine. They provide the operator with safety machine controls complying with IEC 60204-1.

#### With numerous advantages to meet OEM's most common needs

- IEC
- Multiple ratings and sizes
- IP55
- IK07
- Pre-wired

#### Safety starters

They provide similar functions as standard starters but also include emergency stops to comply with IEC 60204-1 machine safety standards.

Enclosed starters

### Selection in 2 steps

- 1 Identify your need (on a single line) in the **Selection criteria** area (example: Load 5 kW – Visible circuit isolation, ON/OFF control with short circuit / overload protection)

- 2 Choose your **Solutions** by adding column contents, note the radical of the product references (example: LG1D)

Selection criteria							Solutions					
Load Power (kW) / 400 V supply	Direct starter ON/OFF	Reverser ON/REVERSE/OFF	Short circuit / overload protection	Power circuit isolation	Visible isolation by rotary switch	Isolated control circuit by transfo						
0.06...4	●		●	●			LG7K					See page
4 ... 9			●	●			LG7D					
0.06... 4	●		●	●	●		LG1K					A1/19
4... 9			●	●	●		LG1D					
0.06... 4	●		●	●		●		LJ7K				A1/20
0.06... 5.5		●	●	●				LG8K				A1/21
0.06 ... 4		●	●	●		●			LJ8K			A1/22
0.06 ... 15	●		●	●						GV2MCK04 GV2ME GV2AX		A1/23





LG7K06



LG7K09, LG7D

## For Control + Isolation + Short circuit / Overload Protection

Enclosed safety motor starters complying with IEC 60204-1 "Safety of machinery" standards.

- ON/OFF motor starters: 1-way rotation control of 3-phase motor
- Emergency stop
- Electrical circuit isolation, lockable (from LG7K09) with up to 3 padlocks
- Short circuit protection
- Overload protection
- Undervoltage protection (LG7K06: with additional undervoltage release module). Switching back on power supply after tripping must be a deliberate action.

Range:

- 12 pre-equipped enclosed safety starters from 0.06 to 9 kW.

Enclosures characteristics:

- Conforming to IEC 60947-1, IEC 60204-1
- Degree of protection according IEC 60529: IP55, IK07
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue) 690 V
- Operating position: same that as contactors
- Material: polycarbonate <sup>(1)</sup>.

Included:

- 1 GV2ME thermal magnetic circuit breaker (with mushroom emergency stop with LG7K06) <sup>(2)</sup>
- 1 LC1K or LC1D pre-wired contactor
- 1 Harmony emergency stop pushbutton (from LG7K09)
- 2 Harmony XB5 pushbuttons.
- 1 GVAX undervoltage release module (from LG7K09).

Additional GVAX undervoltage release module for LG7K06 – to be ordered separately.

Additional GV2SN Indicator light – to be ordered separately.

### Non-reversing starters (with pushbutton control of isolation)

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3			Circuit breaker Setting range of thermal trips	Dust & damp protected starter Basic reference, to be completed by adding the voltage code <sup>(3)</sup>	Weight	Overall dimensions <sup>(4)</sup> WxHxD
220/230 V	400/415 V	440 V			kg	
kW	kW	kW	A			
–	0.06	0.06	0.16...0.25	LG7K0602	1.300	175x165x177
0.06	0.09	0.12	0.25...0.40	LG7K0603	1.300	175x165x177
–	0.18	0.18	0.40...0.63	LG7K0604	1.300	175x165x177
0.12	0.25	0.37	0.63...1	LG7K0605	1.300	175x165x177
0.25	0.55	0.55	1...1.6	LG7K0606	1.300	175x165x177
0.37	0.75	1.1	1.6...2.5	LG7K0607	1.300	175x165x177
0.75	1.5	1.5	2.5...4	LG7K0608	1.300	175x165x177
1.1	2.2	3	4...6.3	LG7K0610	1.300	175x165x177
1.5	4	4	6...10	LG7K0914	1.450	175x165x177
3	5.5	5.5	9...14	LG7D1216	1.600	175x165x177
4	7.5	9	13...18	LG7D1820	1.630	175x165x177
4	9	9	17...23	LG7D1821	1.630	175x165x177

#### Voltage codes <sup>(3)</sup>

Volts ~ 50/60 Hz	24	220/230	230	380/400	400	400/415 for LG7K)
LG7K, LG7D	B7	M7	P7	Q7	V7	N7

<sup>(1)</sup> Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

<sup>(2)</sup> LG7K09, D12, D18: the Emergency Stop function is performed by an undervoltage trip module acting on the circuit breaker. This circuit breaker is always pre-wired for use on 380/400/415 V 50 Hz supply.

For a 60 Hz supply, please consult your Regional Sales Office.

<sup>(3)</sup> Some combinations of variants / control voltage may not be available. Please consult us.

<sup>(4)</sup> Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.





LG1K065

## For Control + Visible Isolation + Short circuit / Overload Protection

Enclosed safety motor starters complying with IEC 60204-1 "Safety of machinery" standards.

- ON/OFF motor starters: 1-way rotation control of 3-phase motor
  - Emergency stop
  - Electrical circuit isolation, lockable with up to 3 padlocks
  - Short circuit protection
  - Overload protection
  - Undervoltage protection (with additional undervoltage release module).
- Switching back on power supply after tripping must be a deliberate action.

Range:

- 12 pre-equipped enclosed safety starters from 0.06 to 9 kW.

Enclosures characteristics:

- Conforming to IEC 60947-1, IEC 60204-1
- Degree of protection according IEC 60529 : IP55, IK07
- Ambient air temperature in operation -5 to + 40°C
- Operational voltage (U<sub>e</sub>) 690 V
- Operating position: same that as contactors
- Material: polycarbonate <sup>(1)</sup>
- Enclosure cannot be opened when energized in position "I".

Included:

- 1 GV2ME thermal magnetic circuit breaker
- 1 LC1K (LG1K starters) or LC1D (LG1D starters) pre-wired contactor
- Switch with rotary red/yellow handle for isolation and emergency
- 2 Harmony XB5 pushbuttons.

Additional GVAX●● undervoltage release module – to be ordered separately.

Additional GV2SN●● indicator light – to be ordered separately.

### Non-reversing starters (with rotary operator for control of isolation)

Enclosure cannot be opened when energised in position "I".

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3			Circuit breaker Setting range of thermal trips	Dust & damp protected starter Basic reference, to be completed by adding the voltage code <sup>(2)</sup>	Weight	Overall dimensions <sup>(3)</sup> WxHxD
220/ 230 V	400/ 415 V	440 V			kg	
kW	kW	kW	A			
–	0.06	0.06	0.16...0.25	LG1K065●●02	0.970	175x165x165
0.06	0.09	0.12	0.25...0.40	LG1K065●●03	0.970	175x165x165
–	0.18	0.18	0.40...0.63	LG1K065●●04	0.970	175x165x165
0.12	0.25	0.25	0.63...1	LG1K065●●05	0.970	175x165x165
0.25	0.55	0.55	1...1.6	LG1K065●●06	0.970	175x165x165
0.37	0.75	1.1	1.6...2.5	LG1K065●●07	0.970	175x165x165
0.75	1.5	1.5	2.5...4	LG1K065●●08	0.970	175x165x165
1.1	2.2	3	4...6.3	LG1K065●●10	0.970	175x165x165
1.5	4	4	6...10	LG1K095●●14	1.120	175x165x165
3	5.5	5.5	9...14	LG1D122●●16	1.270	175x165x165
4	7.5	9	13...18	LG1D182●●20	1.290	175x165x165
4	9	9	17...23	LG1D182●●21	1.290	175x165x165

#### Voltage codes <sup>(2)</sup>

Volts ~ 50/60 Hz	220/ 230	230	380/ 400	400	400/415 (for LG1K)
LG1K, LG1D	M7	P7	Q7	V7	N7

<sup>(1)</sup> Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

<sup>(2)</sup> Some combinations of variants / control voltage may not be available. Please consult us.

<sup>(3)</sup> Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.







LJ7K06

Enclosed starters

## For Control + Isolation + Short circuit / Overload Protection, with isolated 24 V control circuit

Enclosed safety motor starters complying with IEC 60204-1 "Safety of machinery" standards.

- ON/OFF motor starters: 1-way rotation control of 3-phase motor
  - Emergency stop <sup>(1)</sup>
  - Electrical circuit isolation, lockable on LJ7K09 with up to 3 padlocks
  - Short circuit protection
  - Overload protection
  - Protection against voltage drops for LJ7K09. For LJ7K06, a GVAX●● undervoltage trip may be added
  - Possible signaling with GV2SN●● indicator (to be ordered separately).
- Switching back on power supply after tripping must be a deliberate action.

Range:

- 9 pre-equipped enclosed safety starters from 0.06 to 4 kW.

Enclosures characteristics:

- Conforming to IEC 60947-1, IEC 60204-1
- Degree of protection according IEC 60529: IP55, IK07
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue) 690 V
- Operating position: same that as contactors
- Material: polycarbonate <sup>(2)</sup>.

Included:

- 1 GV2ME thermal magnetic circuit breaker with mushroom emergency stop (release on ¼ turn),
  - 1 LC1K pre-wired contactor
  - 2 Harmony XB5 pushbuttons
  - 1 Integral transformer: 400/24 V, 25 VA
  - 1 GVAX undervoltage release module (with LJ7K09).
- Additional GVAX●● undervoltage release module for LJ7K06 - to be ordered separately.
- Additional GV2SN●● indicator light – to be ordered separately.
- Terminal allowing the connection of a volt-free contact, if required, in the control circuit.

### Non-reversing motor starters with integral transformer, pre-wired for operation on a 3-phase 380 to 400 V 50 Hz supply (with pushbutton control of isolator function)

Standard power ratings of 3-phase motors 50 Hz in category AC-3	Circuit breaker	Dust and damp protected starter	Weight	Overall dimensions <sup>(5)</sup> WxHxD
380/400 V	Setting range of thermal trips	Reference <sup>(3) (4)</sup>	kg	
kW	A			
0.06	0.16...0.25	LJ7K06Q702	2.270	175x165x177
0.09	0.25...0.40	LJ7K06Q703	2.270	175x165x177
0.18	0.40...0.63	LJ7K06Q704	2.270	175x165x177
0.25	0.63...1	LJ7K06Q705	2.270	175x165x177
0.55	1...1.6	LJ7K06Q706	2.270	175x165x177
0.75	1.6...2.5	LJ7K06Q707	2.270	175x165x177
1.5	2.5...4	LJ7K06Q708	2.270	175x165x177
2.2	4...6.3	LJ7K06Q710	2.270	175x165x177
4	6...10	LJ7K09Q714	2.270	175x165x146

- <sup>(1)</sup> LJ7K06: the mushroom head type Emergency Stop acts mechanically on the circuit breaker.  
LJ7K09: the Emergency Stop function is performed by an undervoltage trip GVAX385, acting on the circuit breaker. This circuit breaker is always supplied pre-wired for use on 380/400 V 50 Hz.
- <sup>(2)</sup> Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).
- <sup>(3)</sup> In the reference, the voltage code Q7 (380/400 V) indicates the power supply voltage to which the starter will be connected, it being assumed that the contactor has a ~ 24 V coil (see control circuit scheme).
- <sup>(4)</sup> Some combinations of variants / control voltage may not be available. Please consult us.
- <sup>(5)</sup> Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.
- <sup>(6)</sup> Example: LJ7K06Q705A04.
- <sup>(7)</sup> Delete the last 2 digits of the selected starter reference. Example: LJ7K06Q705 becomes LJ7K06Q7.
- <sup>(8)</sup> Circuit breaker to be ordered separately.  
References GV2ME: see chapter B6 "Circuit breakers".

### Variants (pre-assembled) <sup>(4)</sup>

Description	Variants available for starter	Suffix to be added to the starter reference <sup>(6)</sup>
With Emergency Stop No control pushbuttons	LJ7K06Q705...K09Q714	A04
With padlocking facility (fitted as standard on LJ7 K09)	LJ7K06Q705...K06Q710	A29
Without circuit breaker <sup>(8)</sup> (or undervoltage release voltage)	LJ7	<sup>(7)</sup>
Without circuit breaker <sup>(8)</sup> With Emergency Stop No control pushbuttons	LJ7K09Q7	A04
Without circuit breaker <sup>(8)</sup> Without Emergency Stop (if the emergency stop is on the machine)	LJ7K09Q7	A39
Without circuit breaker <sup>(8)</sup> Without Emergency Stop No control pushbuttons	LJ7K09Q7	A04A39





LG8K06



LG8K09

## For Control + Isolation + Short circuit / Overload Protection

For OEM, the enclosed safety motor reverser starters comply with IEC 60204-1 "Safety of machinery" standards.

- ON/REVERSE/OFF motor starters: 2-way rotation control of 3-phase motor
- Emergency stop <sup>(1)</sup>
- Electrical circuit isolation, lockable on LG8K09 and LG8K12 with up to 3 padlocks
- Short circuit protection (switching back on power supply after tripping must be a deliberate action)
- Overload protection
- Protection against voltage drops for LG8K09, LG8K12. For LG8K06, a GVAX●● undervoltage trip may be added.
- Possible signaling with GV2SN●● indicator (to be ordered separately).

Range:

- 10 pre-equipped enclosed safety inverter starters from 0.06 to 5.5 kW.

Enclosures characteristics:

- Conforming to IEC 60947-1, IEC 60204-1 <sup>(1)</sup>
- Degree of protection according IEC 60529: IP55, IK07
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue) 690 V
- Operating position: same that as contactors
- Material: polycarbonate <sup>(2)</sup>

Included:

- 2 LC1K prewired contactors
- 1 GV2ME thermal magnetic circuit breaker with mushroom emergency stop (release on ¼ turn)
- 1 "Stop" black pushbutton + 1 2-position spring return selector switch "I – II"
- 1 GVAX undervoltage release module with LG8K09, LG8K12 (to be ordered separately for LG8K06).

### Reversing starters (with pushbutton control of isolation)

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3			Circuit breaker Setting range of thermal trips	Dust & damp protected starter Basic reference, to be completed by adding the voltage code <sup>(3)</sup>	Weight	Overall dimensions <sup>(4)</sup> WxHxD
220/ 230 V	400/ 415 V	440 V			kg	
kW	kW	kW	A			
–	0.06	0.06	0.16...0.25	LG8K06●●02	1.640	175x165x177
0.06	0.09	0.12	0.25...0.40	LG8K06●●03	1.640	175x165x177
–	0.18	0.18	0.40...0.63	LG8K06●●04	1.640	175x165x177
0.12	0.25	0.25	0.63...1	LG8K06●●05	1.640	175x165x177
0.25	0.55	0.55	1...1.6	LG8K06●●06	1.640	175x165x177
0.37	0.75	1.1	1.6...2.5	LG8K06●●07	1.640	175x165x177
0.75	1.5	1.5	2.5...4	LG8K06●●08	1.640	175x165x177
1.1	2.2	3	4...6.3	LG8K06●●10	1.640	175x165x177
1.5	4	4	6...10	LG8K09●●14	1.640	175x165x177
3	5.5	5.5	9...14	LG8K12●●16	1.640	175x165x177

#### Voltage codes <sup>(3)</sup>

Volts ~ 50/60 Hz	220/ 230	380/ 400	400/ 415
	M7	Q7	N7

<sup>(1)</sup> LG8K06: the mushroom head type Emergency Stop acts mechanically on the circuit breaker. LG8K09, LG8K12: the Emergency Stop function is performed by an undervoltage trip, acting on the circuit breaker.

This circuit breaker is always supplied pre-wired for use on 380/400/415 V 50 Hz. For a 60 Hz supply, please consult your Regional Sales Office.

<sup>(2)</sup> Avoid allowing the material to come into contact with strong bases (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

<sup>(3)</sup> Some combinations of variants / control voltage may not be available. Please consult us.

<sup>(4)</sup> Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.







LJ8K06



LJ8K09

## For Control + Isolation + Short circuit /Overload Protection, with isolated 24 V control circuit

For OEM, the enclosed safety motor reverser starters comply with IEC 60204-1 "Safety of machinery" standards.

- ON/REVERSE/OFF motor starters: 2-way rotation control of 3-phase motor
- Emergency stop <sup>(1)</sup>
- Electrical circuit isolation, lockable on LJ8K09 with up to 3 padlocks
- Short circuit protection (switching back on power supply after tripping must be a deliberate action)
- Overload protection
- Protection against voltage drops for LJ8K09. For LJ8K06, a GVAX●● undervoltage trip may be added
- Possible signaling with GV2SN●● indicator (to be ordered separately).

Range:

- 9 pre-equipped enclosed safety inverter starters from 0.06 to 4 kW.

Enclosures characteristics:

- Conforming to IEC 60947-1, IEC 60204-1
- Degree of protection according IEC 60529: IP55, IK07
- Ambient air temperature in operation -5 to +40°C
- Operational voltage (Ue) 690 V
- Operating position: same that as contactors
- Material: polycarbonate <sup>(2)</sup>.

Included:

- 2 LC1K prewired contactors
- 1 GV2ME thermal magnetic circuit breaker with mushroom emergency stop (release on ¼ turn)
- 1 Integral transformer: 400/24 V, 25 VA
- 1 "Stop" black pushbutton + 1 2-position spring return selector switch "I – II"
- 1 GVAX undervoltage release module with LJ8K09 (to be ordered separately for LJ8K06).
- Terminal allowing the connection of a volt-free contact, if required, in the control circuit.

### Reversing motor starters with integral transformer, pre-wired for operation on a 3-phase 380 to 400 V 50 Hz supply (with pushbutton control of isolator function)

Standard power ratings of 3-phase motors 50 Hz in category AC-3 380/400 V	Circuit breaker Setting range of thermal trips	Dust and damp protected starter Reference <sup>(3)</sup> <sup>(4)</sup>	Weight	Overall dimensions <sup>(5)</sup> WxHxD
kW	A		kg	
0.06	0.16...0.25	LJ8K06Q702	2.650	175x165x177
0.09	0.25...0.40	LJ8K06Q703	2.650	175x165x177
0.18	0.40...0.63	LJ8K06Q704	2.650	175x165x177
0.25	0.63...1	LJ8K06Q705	2.650	175x165x177
0.55	1...1.6	LJ8K06Q706	2.650	175x165x177
0.75	1.6...2.5	LJ8K06Q707	2.650	175x165x177
1.5	2.5...4	LJ8K06Q708	2.650	175x165x177
2.2	4...6.3	LJ8K06Q710	2.650	175x165x177
4	6...10	LJ8K09Q714	2.650	175x165x146

### Variants (pre-assembled) <sup>(4)</sup>

Description	Variants available for starter	Suffix to be added to the starter reference
-------------	--------------------------------	---

Without circuit breaker <sup>(7)</sup>  
(or undervoltage release voltage)

LJ8

<sup>(6)</sup>

<sup>(1)</sup> LJ8 K06: the mushroom head type Emergency Stop acts mechanically on the circuit breaker. LJ8K09: the Emergency Stop function is performed by an undervoltage trip GVAX385, acting on the circuit breaker. This circuit breaker is always supplied pre-wired for use on 380/400 V 50 Hz.

<sup>(2)</sup> Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

<sup>(3)</sup> In the reference, the voltage code Q7 (380/400 V) indicates the power supply voltage to which the starter will be connected, it being assumed that the contactor has a ~ 24 V coil (see control circuit scheme).

<sup>(4)</sup> Some combinations of variants / control voltage may not be available. Please consult us.

<sup>(5)</sup> Dimensions of standard versions, comprising (if any) handle, pushbutton, indicator light.

<sup>(6)</sup> Delete the last 2 digits of the selected starter reference. Example: LJ8K06Q702 becomes LJ8K06Q7.

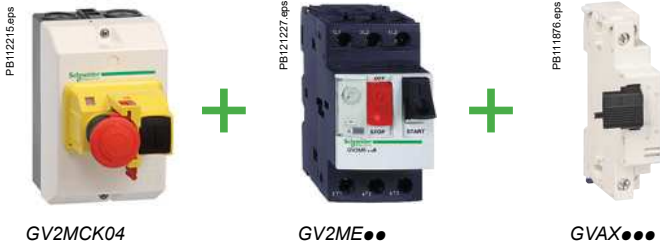
<sup>(7)</sup> Circuit breaker to be ordered separately. References GV2ME: see chapter B6 "Circuit breakers".



TeSys

TeSys GV2MCK04 enclosure for safety starters / DOL / to be completed with GV2ME, GVAX

Product references



GV2MCK04 enclosure is fitted with a mushroom pushbutton.  
It allows, with addition of a circuit breaker and undervoltage trip, the construction of a safety direct-on-line starter conforming INRS and VDE0113.

- Enclosures characteristics:
- Conforming to IEC 60947-2; IEC 60947-4-1
  - Degree of protection according IEC 60529: refer to selection chart
  - Operational voltage (Ue) 690 V
  - Material : polycarbonate <sup>(1)</sup>.

Enclosure						
Enclosure for thermal-magnetic circuit breakers GV2ME						
Type	Degree of protection	Possible no. of side mounting auxiliary contact blocks on GV2ME		Reference	Weight kg	Overall dimensions WxHxD
		LH side	RH side			
Surface mounting, double insulated with protective conductor. Sealable cover	IP55	1	1	GV2MCK04	0.420	93x147x145.5

GV2ME circuit beaker, GVAX undervoltage trip  
Product references: page A1/32.

(1) Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

Enclosed starters









# TeSys

Enclosures, components,  
for customer assemblies  
Spare parts





Enclosed starters

PB121229.eps



VCFXGE4

PB121230.eps



VBFXGE2



PB121231.eps



V0

PB121232.eps



V4

#### Empty enclosures with rotary handle

**IP65 enclosure with red padlockable handle operator and yellow front plate**  
(for mounting a main or Emergency Stop switch-disconnector)

Ithe	For switch body	Nb. of possible add. module attachments	Reference <sup>(1)</sup>	Weight
A	A			kg
10...32	VN12, VN20 V02...V2	2	VCFXGE1	0.340
10...32	V02...V2	4	VCFXGE4	0.660
50...63	V3 - V4	3	VCFXGE2	0.660
100... 140	V5 - V6	1	VCFXGE6	1.04

**IP65 enclosure with black padlockable handle and black front plate**  
(for mounting a main switch-disconnector)

10...32	VN12, VN20 V02...V2	2	VBFXGE1	0.340
10...32	V02...V2	4	VBFXGE4	0.660
50...63	V3-V4	3	VBFXGE2	0.660
100... 140	V5 - V6	1	VBFXGE6	1.04

#### Switch bodies to fit VCFX, VBFX enclosures <sup>(2)</sup>

##### Standard applications

Description	Rating	Reference	Weight
	A		kg
3-pole switch-disconnectors	10	VN12	0.110
	16	VN20	0.110

##### High performance applications

Description	Rating	Reference	Weight
	A		kg
3-pole switch-disconnectors	10	V02	0.200
	16	V01	0.200
	20	V0	0.200
	25	V1	0.200
	32	V2	0.200
	50	V3	0.500
	80	V4	0.500
	125	V5	0.900
	175	V6	0.900

<sup>(1)</sup> Enclosure not suitable in atmosphere contaminated with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

<sup>(2)</sup> For characteristics of switch-disconnectors, please consult your Regional Sales Office.





LE1GVMEK, LE1GVMEKA59

#### Empty enclosures with sealing device

Composition	Reference
Insulating enclosure with GV2E01 sealing device	LE1GVMEK
Insulating enclosure with GV2E01 sealing device, neutral terminal	LE1GVMEKA59

#### Direct-on-line starters characteristics

(based on LE1GVMEK enclosure + GV2ME circuit breaker + LC1K contactor assemblies)

Functions / range / specificities:

- Circuit Isolation
- Protection against short circuit
- Motor protection: motor OFF in case of overload – manual reset with the black pushbutton.
- ON/OFF motor control
- Functions can be completed with optional components: remote control, signaling.

Enclosures characteristics:

- Conforming to IEC 60947-4-1 standard
- Degree of protection IP55, according IEC 60529
- Ambient air temperature in operation -5 to +40°C
- Operating position: same as TeSys K series contactors
- Material: polycarbonate <sup>(1)</sup>.

■ 6 ratings of direct-on-line starters from 0.37 to 5.5 kW (400 V AC) can be realized, based the combinations of circuit breaker + contactor to be ordered separately:

- GV2ME thermal magnetic circuit breaker, of the required rating (see below)
- LC1K contactor, of the required rating (see below)
- optional accessories (indicating light, On pushbutton, sealing kit...).

#### Circuit breakers + contactors - Type 1 coordination <sup>(2)</sup>

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic current 13 Irth	For customer assembly	
400/415 V	440 V	500 V			Motor circuit breaker Reference	Contactor Reference to be completed with the coil voltage code
kW	kW	kW	A	A		
0.37	0.37	0.37	1...1.6	22.5	GV2ME06	LC1K0610●●
0.55	0.55	0.55				
-	-	0.75				
0.75	0.75	-	1.6...2.5	33.5	GV2ME07	LC1K0610●●
-	1.1	1.1				
1.1	-	1.5	2.5...4	51	GV2ME08	LC1K0610●●
1.5	1.5	2.2				
2.2	2.2	-	4...6.3	78	GV2ME10	LC1K0610●●
-	3	3				
3	-	4	6...10	138	GV2ME14	LC1K0910●●
4	4	5.5				
5.5	5.5	7.5	9...14	170	GV2ME16	LC1K1210●●

#### Coil voltage codes

Volts	24	110	220/230	230	230/240	380/400
~ 50/60 Hz	B7	F7	M7	P7	U7	Q7
---	BW3	-	-	-	-	-

BW3 coil: low consumption (1.5 W), wide range (0.7...1.3 Uc) with integral suppression device as standard.

<sup>(1)</sup> Avoid placing this material in contact with harsh substances (detergents, chlorine solvents, ketones, alcohol, aromatic hydrocarbons).

<sup>(2)</sup> Extract from Coordination tables see chapter A6.



GV2ME●●



LC1K0610●●



# TeSys

## TeSys DE1DS empty enclosures for standard starters

### Product references

Enclosed starters

PB11284 eps



DE1DS1A04

PB11286 eps



DE1DS1A05

PB11259 eps



DE1DS1

PB11275 eps



DE1DS1A13

#### Empty enclosures for starters without isolating device

Head(s) mounted on cover	Designed for use with	Reference
Without	LE1D09 and D12	DE1DS1A04
	LE1D18...D35	DE1DS2A04
	LE2D09...D35	DE1DS2A04
1 flush blue head "R"	LE1D09 and D12	DE1DS1A05
	LE1D18...D35	DE1DS2A05
	LE2D09...D35	DE1DS2A05
1 flush green head "I" 1 projecting red head "O"	LE1D09 and D12	DE1DS1
	LE1D18...D35	DE1DS2
1 flush blue head "R" 1 switch with 3 fixed positions	LE1D18...D35	DE1DS2A09
1 flush blue head "R" 1 switch with 2 fixed positions	LE1D09 and D12	DE1DS1A13
	LE1D18...D35	DE1DS2A13

Dimensions:  
page A1/44



# TeSys

## TeSys DE1KS empty enclosures for safety starters

### Product references

PB11091 eps



DE1KS217A06

PB11096 eps



DE1KS217A06A37

Empty enclosures for security starters			
Designed for use with	Head(s) mounted on cover	Add-on blocks	Reference

LG7	Without		DE1KS217A04
-----	---------	--	-------------

1 flush white head "I"			DE1KS217A06
1 projecting black head "O"			

1 flush white head "I"			DE1KS217A06A37
1 projecting black head "O"			
1 head emergency stop	Padlocking devices		

Enclosed starters





PB111915 eps



GV2V01

PB112390 eps



GV2K011

PG113130 eps



GV2K021

8274 eps



GV2K031

PB112393 eps



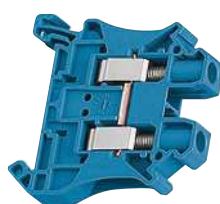
GV2K04

PB121228 eps



GV2E01 - GV2E02

PB502236 eps



NSYTRV62BL

PB502246 eps



NSYTRAC22BL

PB112218 eps



GV2CP21

Accessories					
Description		Sold in lots of	Unit reference	Weight kg	
Mushroom head pushbutton Ø 40 mm, red, IP55	Padlocking device <sup>(6)</sup> for GV2ME operator (padlocking is only possible in the "O" position)	1 to 3 padlocks Ø 4 to 8 mm	1	GV2V01	0.075
	Spring return <sup>(2)</sup>		1	GV2K011	0.052
	Emergency stop Latching <sup>(2)</sup>	Key release, key n° 455	1	GV2K021	0.160
		Turn to release	1	GV2K031	0.115
		Turn to release, padlockable	1	GV2K04 <sup>(1)</sup>	0.120
Sealing kit	For enclosures and front plate	IP 55 for temperature between +5 °C and +40 °C	10	GV2E01	0.012
		IP 55 for temperature between -20 °C and +40 °C	10	GV2E02	0.012
Linery passthrough neutral terminal block – 6 mm² 41 A single-level 1x1 screw		50	NSYTRV62BL	0.015	
End cover for Linery screw single-level terminal block		50	NSYTRAC22BL	0.003	

<sup>(1)</sup> Circuit breaker to be ordered separately. Commercial references of GV2ME01 to M22: see chapter B6 "Circuit breakers".

<sup>(2)</sup> Supplied with IP55 GV2E01 sealing kit. To be fitted with enclosure GV2M●01.

<sup>(3)</sup> Padlockable in "O" position using Ø 4 to 8 mm shank padlocks.

### Separate front plate for GV2ME

Provides a sealing cover to GV2ME circuit breaker, on any kind of front panel.

Front plate			
Description		Reference	Weight kg
For direct control, through a panel, of a chassis mounted GV2ME	IP55	GV2CP21	0.800





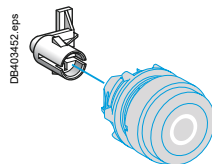
ZB5AA331



ZB5AL432



LAD9091



DB403452 eps



PF141188 eps

ZB5AD●



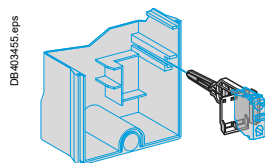
PB121236 eps

ZENL1111



PB121237 eps

LAD90909



DB403455 eps

#### Heads for Start and Stop/Reset pushbuttons

Description	For use on	Unit reference
Flush, green "I" <sup>(1)</sup>	LE1, LE3, LE4, LE6 D09...D35	<b>ZB5AA331</b>
Projecting, red "O" <sup>(1)</sup>	LE●D09...D35	<b>ZB5AL432</b>
Adaptation kit for head ZB5AL432	LE1D09 and D12	<b>LAD9091</b>
	LE1D18...D35, LE2D09...D35	<b>LAD91810</b>
	LE3, LE4, LE6 and LE8 D09...D35	<b>LAD9T4</b>

#### Heads for Reset pushbuttons

Flush, blue "R" <sup>(2)</sup>	LE●D09...D35	<b>ZB5AA0</b>
		+ <b>ZBA639</b> <sup>(3)</sup>
Adaptation kit for head ZB5AA0 + ZBA639	LE1D09 and D12	<b>LAD9092</b>
	LE1D18...D35, LE2D09...D35	<b>LAD91810</b>
	LE3, LE6, LE4 and LE8D09...D35	<b>LAD9T4</b>

#### Heads for selector switches

3-position stay put	LE1D09...D35●●A09	<b>ZB5AD3</b>
2-position stay put	LE1D09...D35●●A13	<b>ZB5AD2</b>
3-position spring return to centre	LE2D09...D35 LE8D09...D35	<b>ZB5AD5</b>

#### Contact blocks

1 N/O spring return	LE●D09...D35	<b>ZENL1111</b>
1 N/C spring return	LE●D09...D35	<b>ZENL1121</b>
Mounting for contact block	LE1D09 and D12	<b>LAD90909</b>
	LE1D18...D35, LE2, LE3, LE4, LE6 and LE8D09...D35	<b>LAD91809</b>

<sup>(1)</sup> Remember to order adaptation kit LAD9091 or LAD91810 or LAD9T4, depending on size.

<sup>(2)</sup> Remember to order adaptation kit LAD9092 or LAD91810 or LAD9T4, depending on size.

<sup>(3)</sup> Sold in lots of 10.





GV2ME●●

## Thermal magnetic circuit breakers, with screw clamp terminals

## GV2ME with pushbutton control

Standard power ratings of 3-phase motors  
50/60 Hz in category AC-3

400/415 V			500 V			690 V			Setting range of thermal trips (2)	Magnetic tripping current I <sub>d</sub> ± 20 %	Reference
P	I <sub>cu</sub>	I <sub>cs</sub> (1)	P	I <sub>cu</sub>	I <sub>cs</sub> (1)	P	I <sub>cu</sub>	I <sub>cs</sub> (1)			
kW	kA	%	kW	kA	%	kW	kA	%			
—	—	—	—	—	—	—	—	—	0.1...0.16	1.5	GV2ME01
0.06	★	★	—	—	—	—	—	—	0.16...0.25	2.4	GV2ME02
0.09	★	★	—	—	—	—	—	—	0.25...0.40	5	GV2ME03
0.12	★	★	—	—	—	0.37	★	★	0.40...0.63	8	GV2ME04
0.18	★	★	—	—	—	—	—	—			
0.25	★	★	—	—	—	0.55	★	★	0.63...1	13	GV2ME05
0.37	★	★	0.37	★	★	—	—	—	1...1.6	22.5	GV2ME06
0.55	★	★	0.55	★	★	0.75	★	★			
—	—	—	0.75	★	★	1.1	★	★			
0.75	★	★	1.1	★	★	1.5	3	75	1.6...2.5	33.5	GV2ME07
1.1	★	★	1.5	★	★	2.2	3	75	2.5...4	51	GV2ME08
1.5	★	★	2.2	★	★	3	3	75			
2.2	★	★	3	50	100	4	3	75	4...6.3	78	GV2ME10
3	★	★	4	10	100	5.5	3	75	6...10	138	GV2ME14
4	★	★	5.5	10	100	7.5	3	75			
5.5	15	50	7.5	6	75	9	3	75	9...14	170	GV2ME16
—	—	—	—	—	—	11	3	75			
7.5	15	50	9	6	75	15	3	75	13...18	223	GV2ME20
9	15	40	11	4	75	18.5	3	75	17...23	327	GV2ME21
11	15	40	15	4	75	—	—	—	20...25	327	GV2ME22 (3)

GV2ME technical characteristics: see in chapter B6.

## Undervoltage trip, INRS (can only be mounted on GV2ME)

## Safety device for dangerous machines conforming to INRS and VDE0113

Side (1 block on RH side of circuit breaker GV2 ME)	110...115 V	50 Hz	GVAX115
		60 Hz	GVAX116
	127 V	60 Hz	GVAX115
	220...240 V	50 Hz	GVAX225
		60 Hz	GVAX226
	380...400 V	50 Hz	GVAX385
		60 Hz	GVAX386
	415...440 V	50 Hz	GVAX415
	440 V	60 Hz	GVAX385

GVAX technical characteristics: see in chapter B6.

(1) As % of I<sub>cu</sub>.

(2) The thermal trip setting must be within the range marked on the graduated knob.

(3) Maximum rating which can be mounted in enclosures GV2MC or MP, please consult your Regional Sales Office.

★ &gt; 100 kA.



GVAX●●●



# TeSys

## TeSys LR2K, LRD thermal overload relays

### Product references



LR2K●●

#### Thermal overload relays - selection table

LR2K thermal overload relays can be mounted on all 3P LC1K contactors with screw clamp connectors.

**Class 10 A** (the standard specifies a tripping time of between 2 and 10 seconds at 7.2 In)

Relay setting range	Fuses to be used with selected relay			Reference
	Maximum rating Type	aM	gG	BS88
A	A	A	A	
0.11...0.16	0.25	0.5	–	LR2K0301
0.16...0.23	0.25	0.5	–	LR2K0302
0.23...0.36	0.5	1	–	LR2K0303
0.36...0.54	1	1.6	–	LR2K0304
0.54...0.8	1	2	–	LR2K0305
0.8...1.2	2	4	6	LR2K0306
1.2...1.8	2	6	6	LR2K0307
1.8...2.6	4	8	10	LR2K0308
2.6...3.7	4	10	16	LR2K0310
3.7...5.5	6	16	16	LR2K0312
5.5...8	8	20	20	LR2K0314
8...11.5	10	25	20	LR2K0316
10...14	16	32	25	LR2K0321
12...16	20	40	32	LR2K0322

LRD thermal overload relays can only be mounted on LC1D contactors of same size ratio and with screw clamp connectors.

Relay setting range (A)	Fuses to be used with selected relay			For use with contactor LC1	Reference
	aM (A)	gG (A)	BS88 (A)		
Class 10 A <sup>(1)</sup> for connection by screw clamp terminals or connectors					
0.10...0.16	0.25	2	–	D09...D38	LRD01
0.16...0.25	0.5	2	–	D09...D38	LRD02
0.25...0.40	1	2	–	D09...D38	LRD03
0.40...0.63	1	2	–	D09...D38	LRD04
0.63...1	2	4	–	D09...D38	LRD05
1...1.6	2	4	6	D09...D38	LRD06
1.6...2.5	4	6	10	D09...D38	LRD07
2.5...4	6	10	16	D09...D38	LRD08
4...6	8	16	16	D09...D38	LRD10
5.5...8	12	20	20	D09...D38	LRD12
7...10	12	20	20	D09...D38	LRD14
9...13	16	25	25	D12...D38	LRD16
12...18	20	35	32	D18...D38	LRD21
16...24	25	50	50	D25...D38	LRD22
23...32	40	63	63	D25...D38	LRD32
30...38	40	80	80	D32 and D38	LRD35



LRD●●

Enclosed starters



Enclosed  
starters



## Technical Data for Designers

### Contents

Switch-disconnectors .....	A1/36 to A1/38
Direct-on-line starters .....	A1/39, A1/41 to A1/47
.....and A1/49	
Star-delta starters .....	A1/40 and A1/48
Starters for safety applications .....	A1/50 to A1/53



# TeSys

## TeSys Vario enclosed switch-disconnectors

### Dimensions

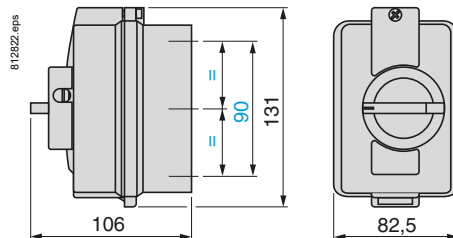
Enclosed starters

Ref.



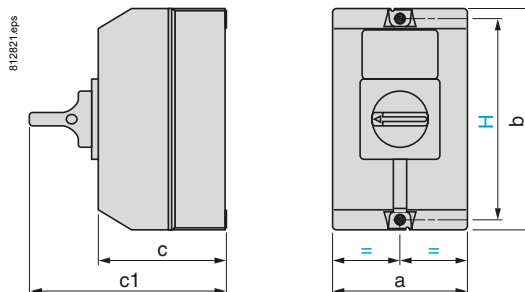
#### Dimensions

##### VCFN12GE to VCFN40GE



Cable glands: 2 x 16 P top and bottom.

##### VCF or VBF02GE to 4GE, VCF●●GEGP and VCF●GEGP, VCFX or VBFXGE1 to GE4

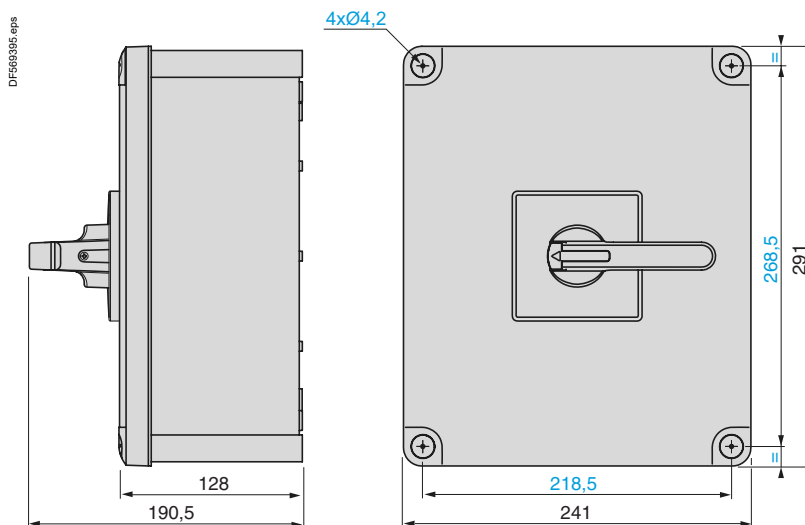


	a	b	c	c1	H
<b>V●F02GE to V●F2GE, V●FXGE1</b>	90	146	85	131	130
<b>VCF●●GEGP and VCF●GEGP <sup>(1)</sup></b>					
<b>V●F3GE and V●F4GE <sup>(2)</sup></b>	157	180	107	152	164
<b>V●FXGE2 and V●FXGE4 <sup>(2)</sup></b>	157	180	107	152	164

<sup>(1)</sup> Cable glands: 2x ISO 16 rear, 4x ISO 20/25 top and bottom.

<sup>(2)</sup> Cable glands: 4x ISO 25/32 rear, 4x ISO 25/32 top and bottom.

##### VCF or VBF5GEN and 6GEN

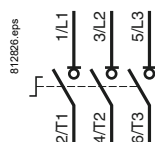




## Schemes

### Switch-disconnectors

#### Enclosed or switch bodies



#### Main pole module



#### Neutral pole module



### Auxiliary contact blocks

#### VZ7



#### VZ20



#### VZN05



#### VZN06

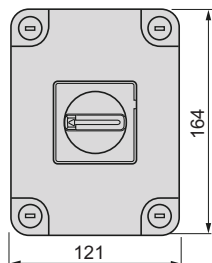
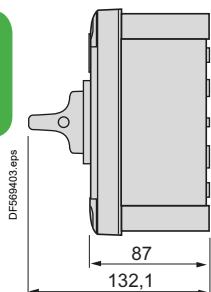




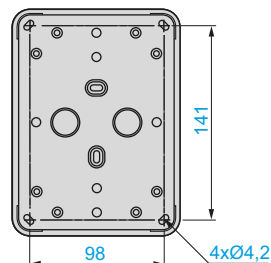
#### Dimensions

##### VC1GUN and VC2GUN

Enclosed starters

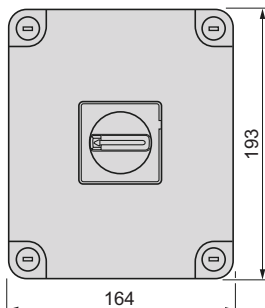
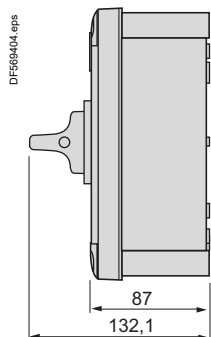


Fixing (rear view)

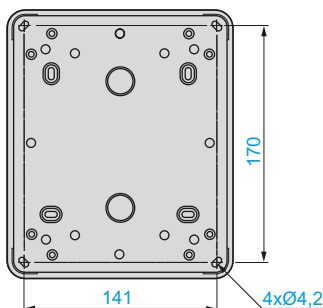


##### VC3GUN and VC4GUN

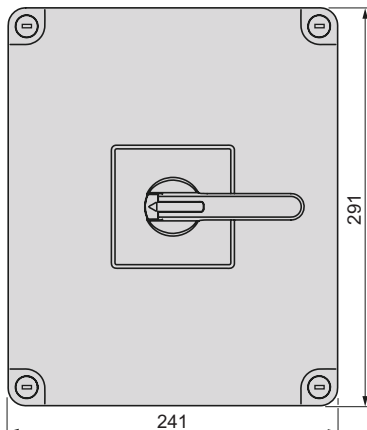
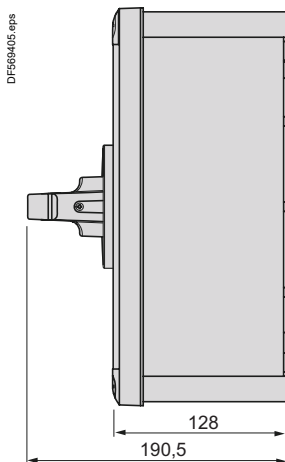
Ref.



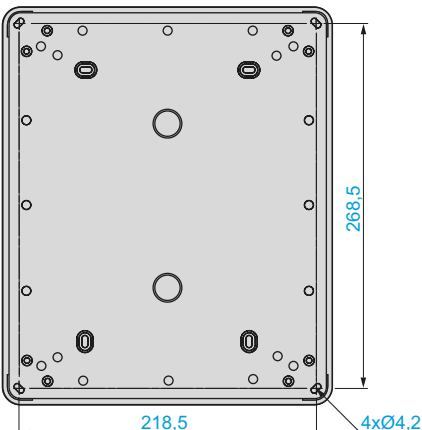
Fixing (rear view)



##### VC5GUN and VC6GUN



Fixing (rear view)



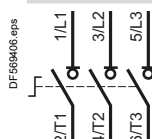
#### Schemes

##### Switch-disconnectors

Enclosed switch-disconnectors or switch bodies

Main pole module

Neutral pole module



##### Auxiliary contact block modules

VZ7

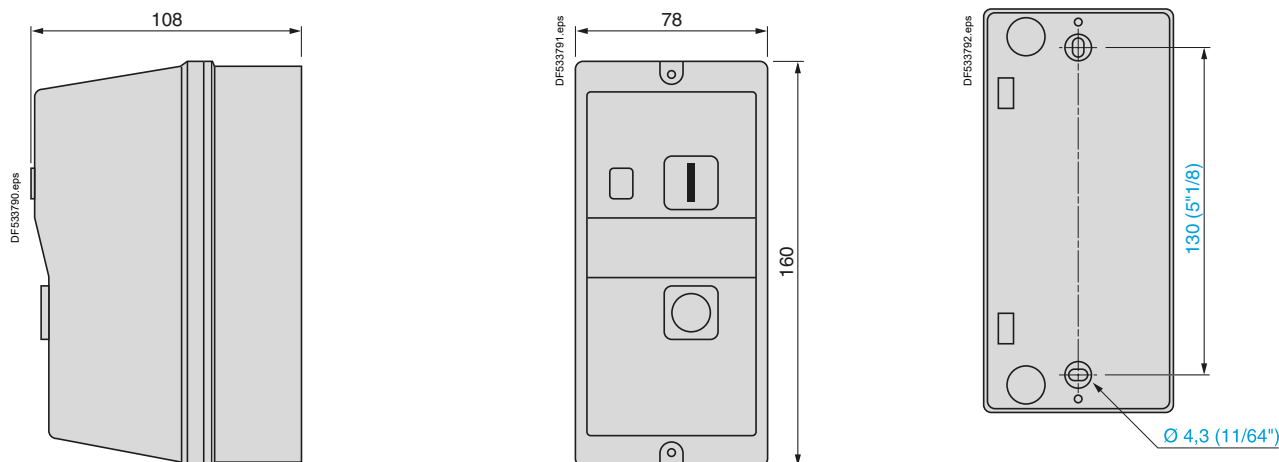
VZ20





#### Dimensions

##### LE1M35 <sup>(1)</sup>



#### Knock-outs or blanking plugs for cable glands

Enclosure type	At top		At bottom	
	PG	ISO	PG	ISO
LE1 M	2 x 13 to 2 x 21	2 x 20 or 2 x 25	2 x 13 to 2 x 21	2 x 20 or 2 x 25

(1) Can be mounted on machine panel or frame. Knock-outs for 4 x 13 P cable glands.

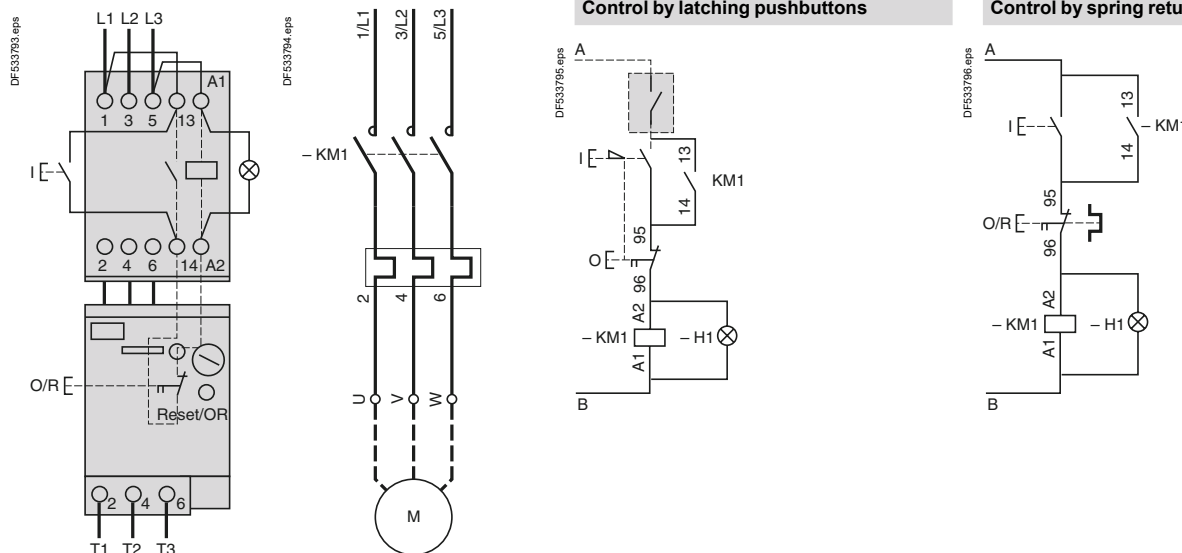
#### Schemes

##### LE1M35

#### Choice of type of control built into the product

##### Control by latching pushbuttons

##### Control by spring return pushbuttons



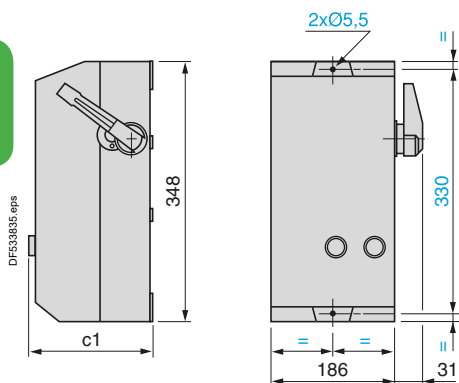
#### Connections

Power voltage	Control circuit voltage	A	B
380 V, 400 V, 415 V, 440 V	220 V, 230 V, 240 V	L3	Neutral
	380 V, 400 V, 415 V, 440 V	L3	L1
	Other voltages	For customer assembly	
Other voltages	All voltages (440 V max)	For customer assembly	



## Dimensions

**LE6D09...D18**



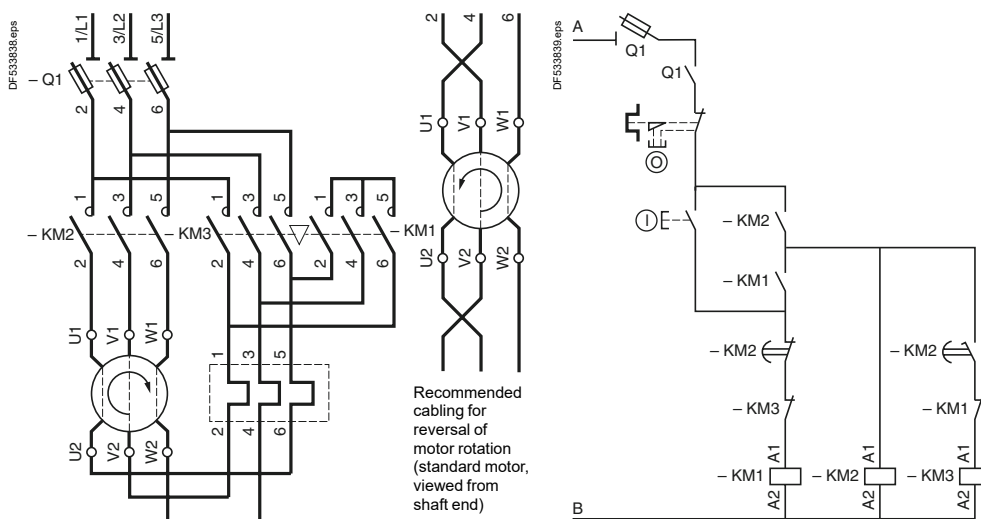
	<b>c1</b>
Standard version	175.5
Variant A04	167
Variant A05	175.5

### Knock-outs or blanking plugs for cable glands

Type of enclosure	At top		At bottom	
	PG	ISO	PG	ISO
LE6D09...D18	—	2 x 20 or 2 x 25 or 2 x 32 or 2 x 40	—	2 x 20 or 2 x 25 or 2 x 32 or 2 x 40

## Schemes

**LE6D09...D18**



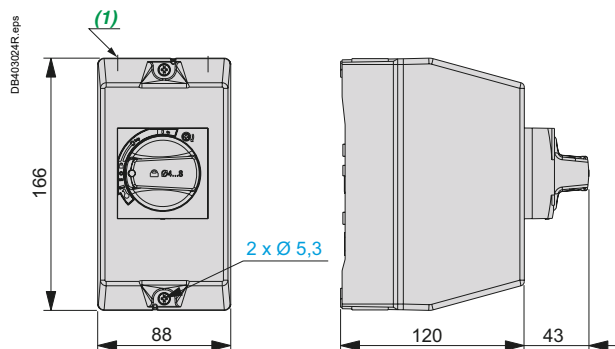
## Connections

Power voltage	Control circuit voltage	A	B
380 V, 400 V, 415 V, 440 V	220 V, 230 V, 240 V	L3	Neutral terminal
	380 V, 400 V, 415 V, 440 V	L3	L1
	Other voltages	Terminal 1	Terminal 2
Other voltages	All voltages (600 V max)	For customer assembly	



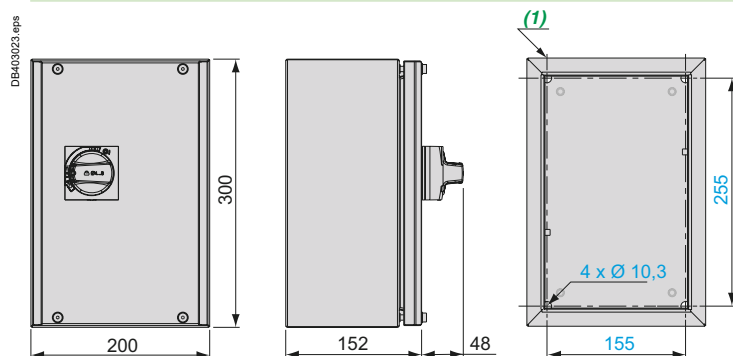
#### Dimensions

##### GV2PC●●



(1) Top face: 2 knock-outs for ISO20 cable glands.  
Bottom face: 2 knock-outs for ISO20 cable glands.

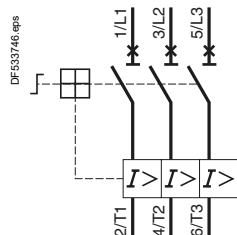
##### GV3PC●●



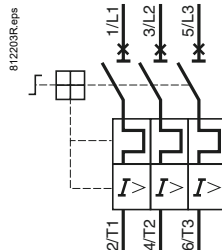
(1) Top face: 1 blanking plug for ISO32 cable gland.  
Bottom face: 2 blanking plugs for ISO32 cable gland + 1 blanking plug for ISO20 cable gland.

#### Schemes

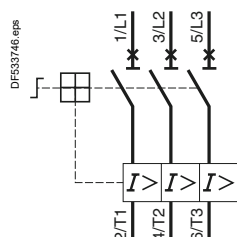
##### GV2L



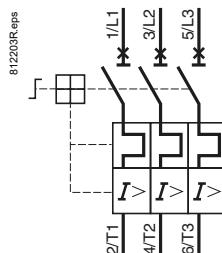
##### GV2P



##### GV3L



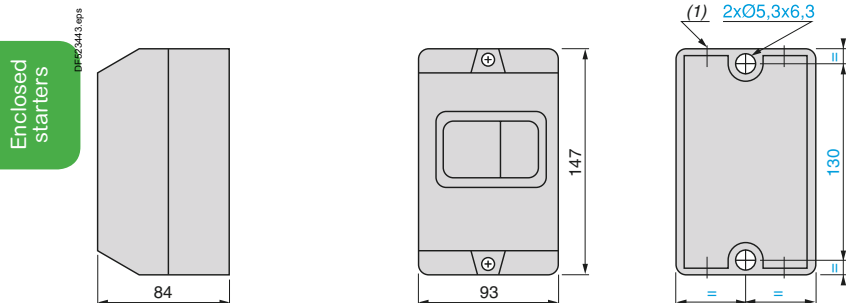
##### GV3P





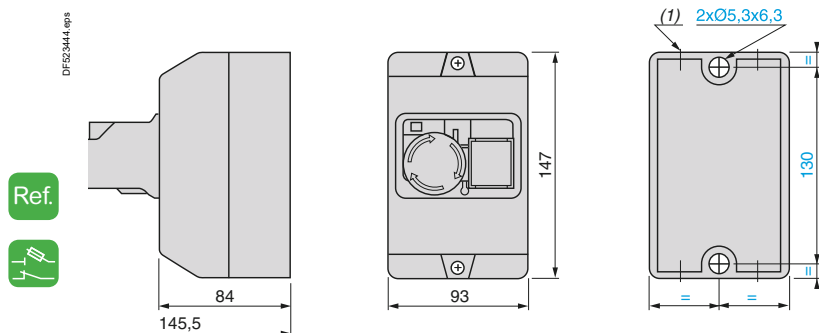
#### Dimensions

##### Surface mounting enclosure GV2MC0●



(1) Top face: 2 knock-outs for ISO20/25 cable glands or Pg16 or 16mm conduits.  
Bottom face: 2 knock-outs for ISO20/25 cable glands or Pg16 or 16mm conduits.

##### Surface mounting enclosure GV2MCK04



(1) Top face: 2 knock-outs for ISO20/25 cable glands or Pg16 or 16mm conduits.  
Bottom face: 2 knock-outs for ISO20/25 cable glands or Pg16 or 16mm conduits.

#### Mounting

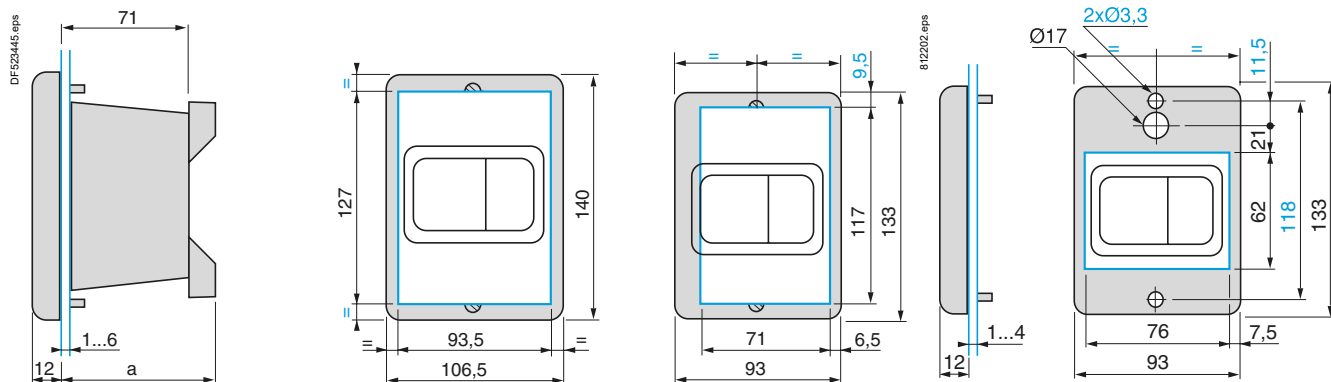
##### Flush mounting enclosures GV2MP0● (panel cut-out)

###### GV2MP0●

###### GV2MP01, MP02

###### GV2MP03, MP04

###### Front plate GV2CP21

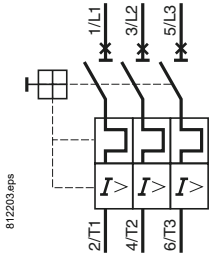


GV2	a
MP01, MP02	—
MP03, MP04	86



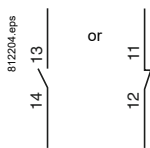
#### Schemes

##### GV2ME●●

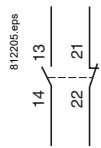


#### Instantaneous auxiliary contacts

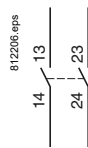
##### GVAE1



##### GVAE11

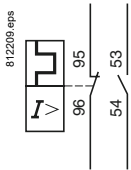


##### GVAE20

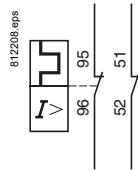


#### Instantaneous auxiliary contacts and fault signalling contacts

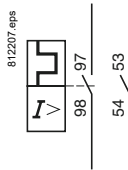
##### GVAD0110



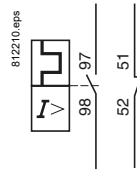
##### GVAD0101



##### GVAD1010

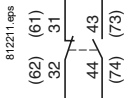


##### GVAD1001



#### Instantaneous auxiliary contacts

##### GVAN11

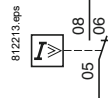


##### GVAN20



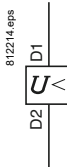
#### Short-circuit signalling contacts

##### GVAM11

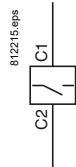


#### Undervoltage trips

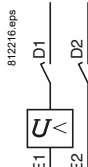
##### GVAU●●●



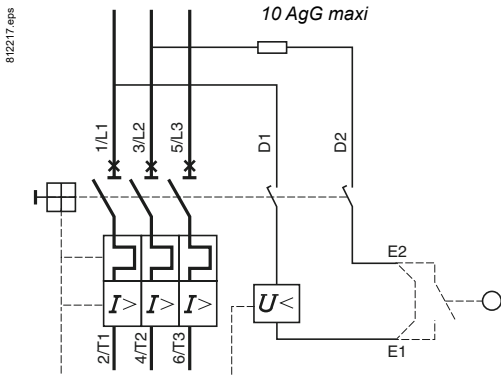
##### GVAS●●●



##### GVAX●●●



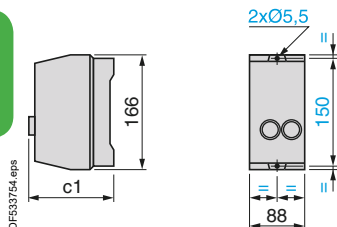
#### Wiring diagram for undervoltage trip used on potentially dangerous machines, conforming to INRS



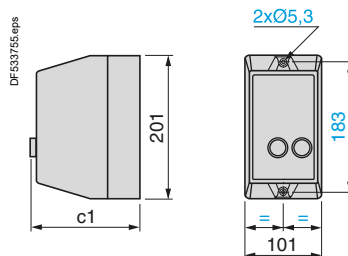


#### Dimensions

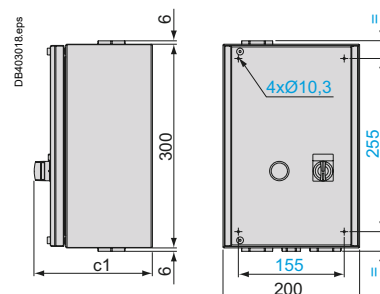
##### LE1D09 and D12



##### LE1D09...T LE1D18...D35 and LE2D09...D35



##### LE1D40A...D65A LE2D40A...D65A

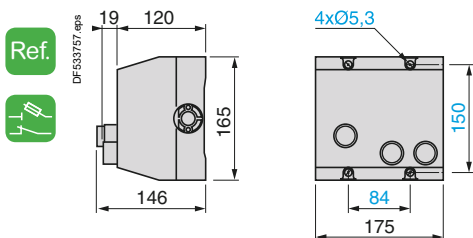


	c1
Standard version	128.5
Variant A04	120
Variant A05	128.5
Variant A09	120
Variant A13	120

	c1	
	LE1D	LE2D
Standard version	153.5	160
Variant A04	145	145
Variant A05	153.5	153.5
Variant A09	160	–
Variant A13	160	–

	c1	
	LE1D	LE2D
Standard version	158.5	174
Variant A04	150	150
Variant A05	158.5	158.5

##### LE2K06 and K09



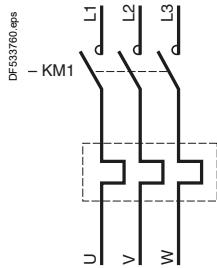
#### Knock-outs or blanking plugs for cable glands

Type of enclosure	At top		At bottom	
	PG	ISO	PG	ISO
LE1D09 and D12	–	2 x 20	–	2 x 20
LE1D18...D35 and LE2D09...D35	–	2 x 20 or 2 x 25	–	2 x 20 or 2 x 25
LE1 and LE2D40A...D65A	–	1 x 32	–	1 x 20 and 2 x 32
LE2K06 and K09	2 x 13 and 2 x 16	4 x 20	2 x 13 and 2 x 16	4 x 20

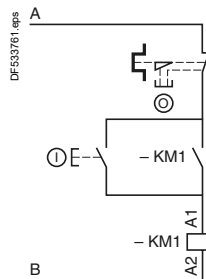


#### Schemes

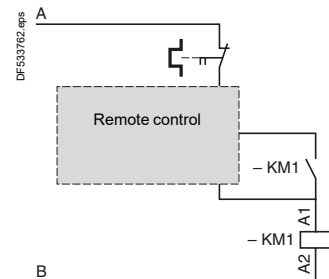
##### LE1D09...D65A



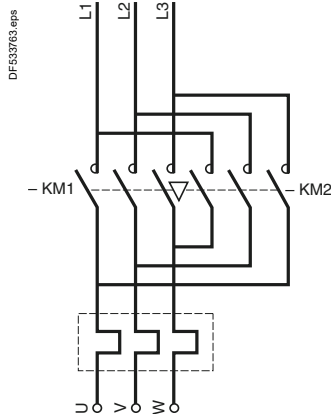
##### LE1D09...D65A



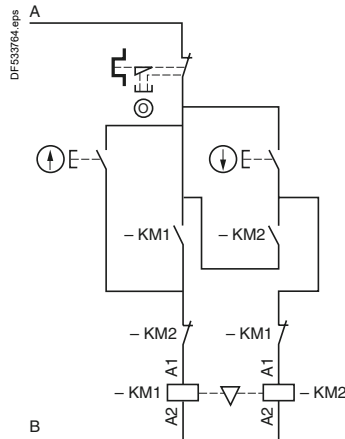
##### LE1D09...D65A with variant A04 or A05



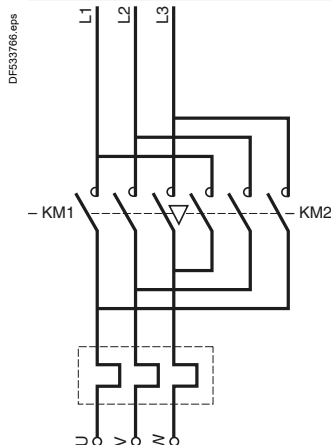
##### LE2K06, K09



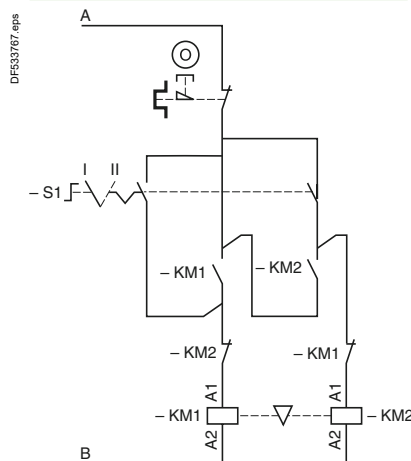
##### LE2K06, K09



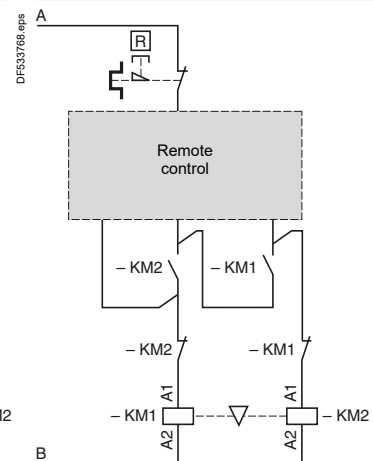
##### LE2D09...D65A



##### LE2D09...D65A



##### LE2D40A...D65A with variants A04 or A05



#### LE1D09...D65A, LE2D09...D65A Connections

Power voltage	Control circuit voltage	A	B
380 V, 400 V, 415 V, 440 V	220 V, 230 V, 240 V	L3	Neutral terminal
	380 V, 400 V, 415 V, 440 V	L3	L1
	Other voltages	Terminal 1	Terminal 2
Other voltages	Other voltages (600 V max)	For customer assembly	

#### LE2K06, K09 Connections

Power voltage	Control circuit voltage	A	B
380 V, 400 V, 415 V	220 V, 230 V, 240 V	L3	Neutral
	380 V, 400 V, 415 V	L3	L1
Other voltages	Other voltages (440 V max)	For customer assembly	



TeSys

TeSys LE4K, LE8K, LE4D, LE8D enclosed standard starters / DOL, reverser

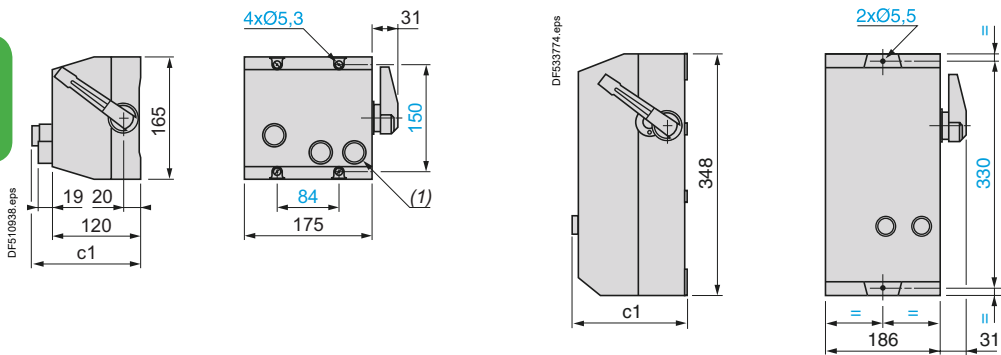
Dimensions

Dimensions

LE4K06 and K09, LE8K06 and K09

LE4D09...D35, LE8D09...D35

Enclosed starters



	c1	
	LE4K	LE8K
Standard version	146	146
Variant A05	–	139

(1) For LE8 only.

	c1	
	LE4D	LE8D
Standard version	175.5	182
Variant A04	167	167
Variant A05	175.5	175.5

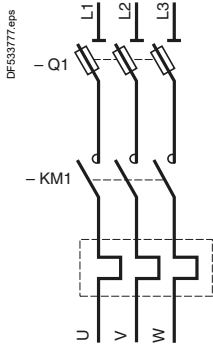
Knock-outs or blanking plugs for cable glands

Type of enclosure	At top		At bottom	
	PG	ISO	PG	ISO
LE4 and LE8D09...D35	–	2 x 20 or 2 x 25 or 2 x 32 or 2 x 40	–	2 x 20 or 2 x 25 or 2 x 32 or 2 x 40
LE4 and LE8K06 and K09	2 x 13 and 2 x 16	4 x 20	2 x 13 and 2 x 16	4 x 20

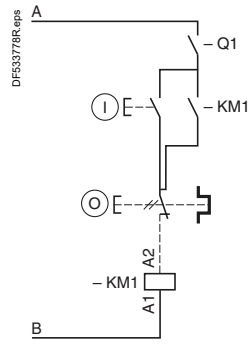


#### Schemes

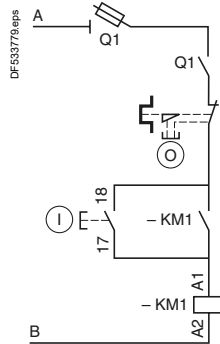
##### LE4K06, K09 LE4D09...D35



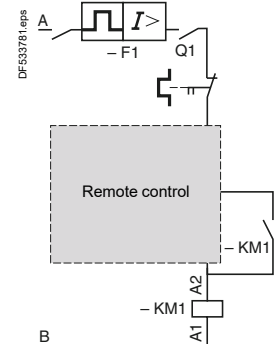
##### LE4K06, K09



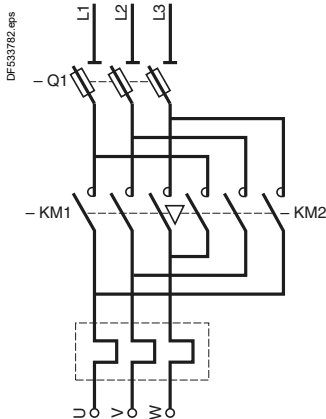
##### LE4D09...D35



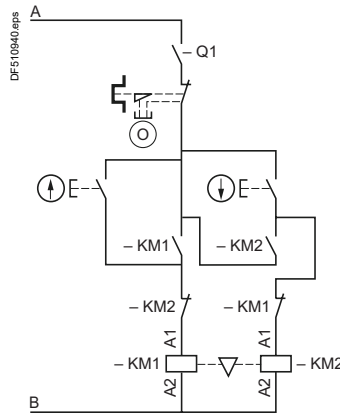
##### LE4D09...D35 with variant A04 or A05



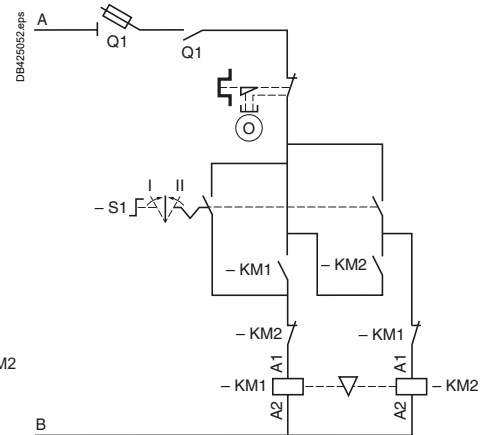
##### LE8K06, K09 LE8D09...D35



##### LE8K06, K09



##### LE8D09...D35



#### LE4D09 and D12, LE8D09 and D12 Connections

Power voltage	Control circuit voltage	A	B
380 V, 400 V, 415 V, 440 V	220 V, 230 V, 240 V	L3	Neutral
	380 V, 400 V, 415 V, 440 V	L3	L1
	Other voltages	Terminal 1	Terminal 2
Other voltages	Other voltages (600 V max)	For customer assembly	

#### LE4D18...D35, LE8D18...D35 Connections

Power voltage	Control circuit voltage	A	B
380 V, 400 V, 415 V, 440 V	220 V, 230 V, 240 V	L3	Neutral terminal
	380 V, 400 V, 415 V, 440 V	L3	L1
	Other voltages	Terminal 1	Terminal 2
Other voltages	Other voltages (600 V max)	For customer assembly	

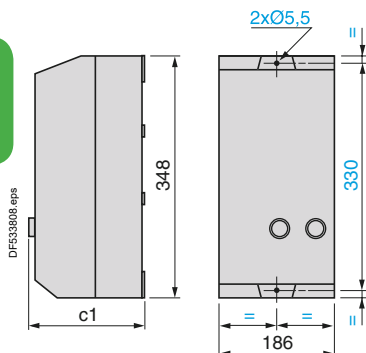
#### LE4K06, K09, LE8K06, K09 Connections

Power voltage	Control circuit voltage	A	B
380 V, 400 V, 415 V	220 V, 230 V, 240 V	L3	Neutral
	380 V, 400 V, 415 V	L3	L1
Other voltages	Other voltages (440 V max)	For customer assembly	



## Dimensions

### LE3D09...D35



#### c1

Standard version	175.5
Variant A04	167
Variant A05	175.5

## Knock-outs or blanking plugs for cable glands

### Type of enclosure

### At top

#### PG

#### ISO

### At bottom

#### PG

#### ISO

LE3D09...D35

—

2 x 20 or 2 x 25 or  
2 x 32 or 2 x 40

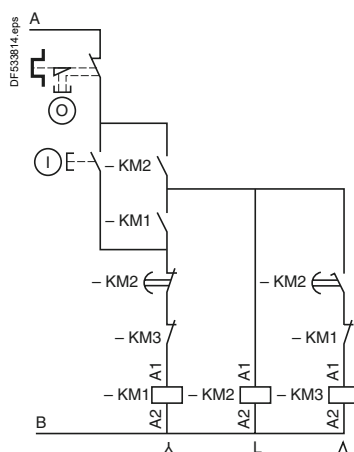
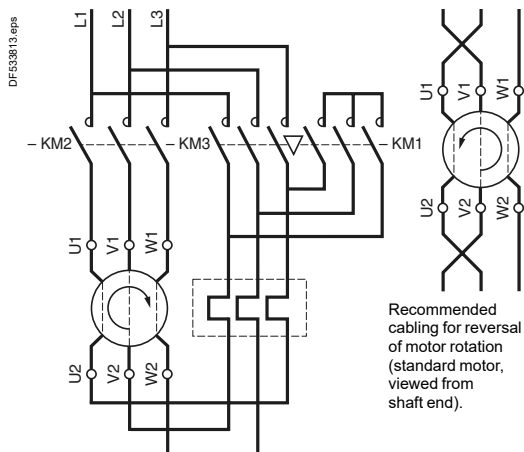
—

2 x 20 or 2 x 25 or  
2 x 32 or 2 x 40

## Schemes

### LE3D09...D35

### LE3D09...D35



**Note:** in accordance with current installation regulations, short-circuit protection must be provided by fuses or a circuit breaker.

## Connections

Power voltage	Control circuit voltage	A	B
380 V, 400 V, 415 V, 440 V	220 V, 230 V, 240 V	L3	Neutral terminal
	380 V, 400 V, 415 V, 440 V	L3	L1
	Other voltages	Terminal 1	Terminal 2
Other voltages	All voltages (600 V max)	For customer assembly	



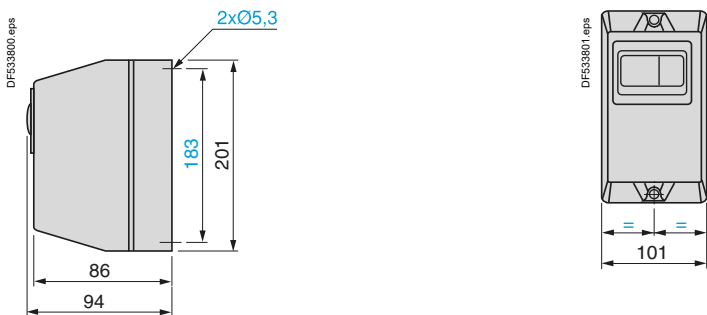
# TeSys

## TeSys LE1GVMEK enclosures for DOL starters

### Dimensions, schemes

#### Dimensions

##### LE1GVMEK

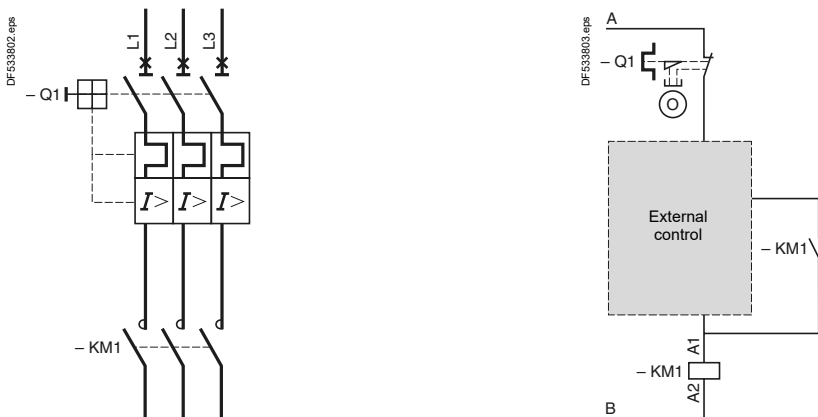


#### Knock-outs or blanking plugs for cable glands

Enclosure type	At top	At bottom
LE1GV	ISO	ISO
	2 x 20 or 2 x 25	2 x 20 or 2 x 25

#### Schemes

##### LE1GVMEK



#### Connections

Power voltage	Control circuit voltage	A	B
380 V, 400 V, 415 V, 440 V	220 V, 230 V, 240 V	L3	Neutral
	380 V, 400 V, 415 V, 440 V	L3	L1
	Other voltages	For customer assembly	
Other voltages	All voltages (440 V max)	For customer assembly	



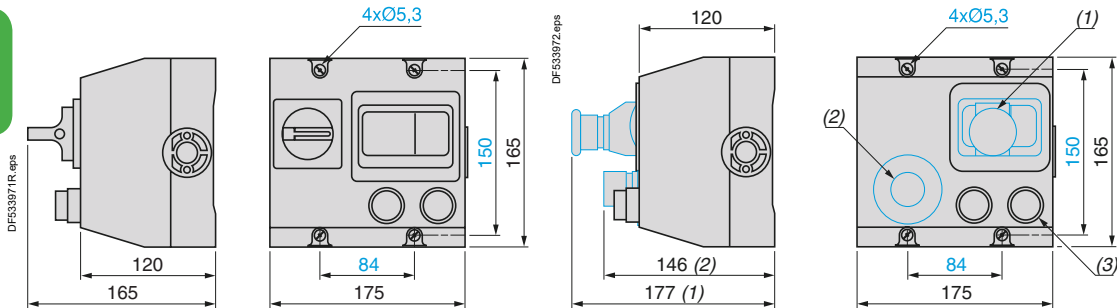
TeSys

TeSys LG1K, LG7K, LG8K, LG1D, LG7D enclosed safety starters / DOL

Dimensions

Dimensions		
LG1K06, K09 LG1D12, D18		LG7K06, K09, LG7D12, D18 LG8K06, K09, K12

Enclosed starters



- (1) Emergency Stop for starters LG●K06.
- (2) Emergency Stop for starters LG●K09, K12, D12 et D18.
- (3) Only for LG7.

Knock-outs or blanking plugs for cable glands		
Type of enclosure	At top	At bottom
LG1K and LG1D	2 x 13 P and 2 x 16 P	2 x 13 P and 2 x 16 P
LG7K and LG7D	2 x 13 P and 2 x 16 P	2 x 13 P and 2 x 16 P
LG8K	2 x 13 P and 2 x 16 P	2 x 13 P and 2 x 16 P

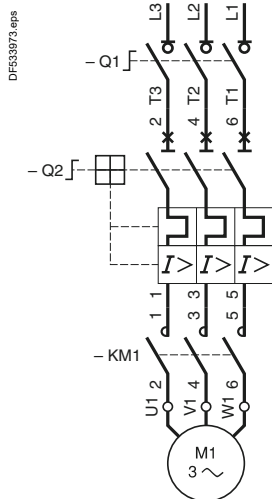
Ref.





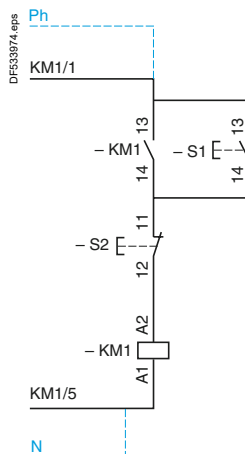
#### Schemes

##### LG1K06, K09, D12, D18

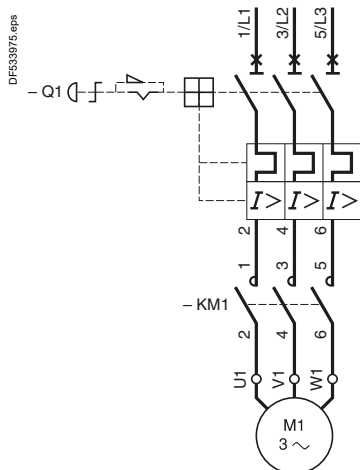


##### LG1K06, K09, D12, D18

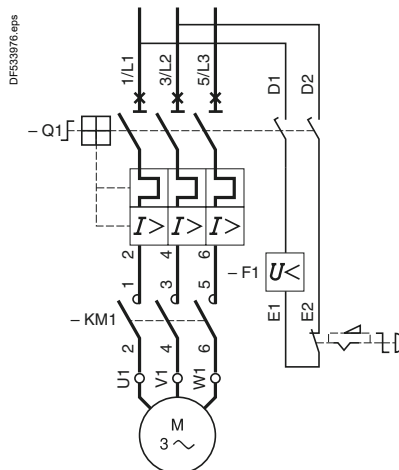
380/400 V, code Q7 or 400/415 V, code N7  
220/230 V, code M7



##### LG7K06

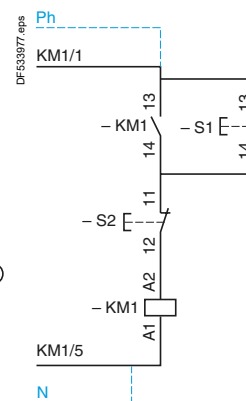


##### LG7K09, D12, D18

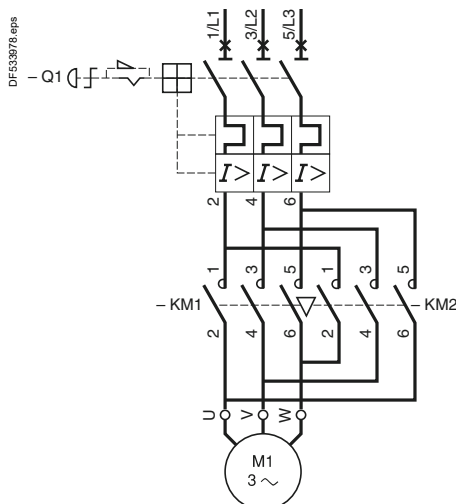


##### LG7K06, K09, D12, D18

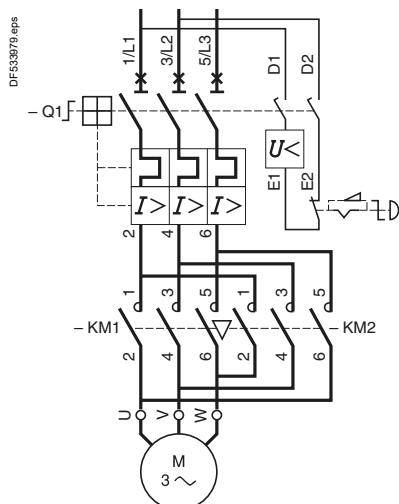
380/400 V, code Q7 or  
400/415 V, code N7  
220/230 V, code M7



##### LG8K06

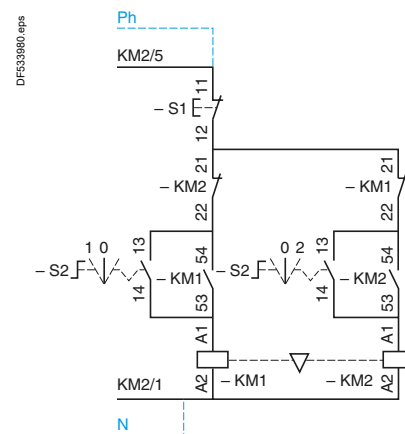


##### LG8K09, K12



##### LG8K06, K09, K12

380/400 V, code Q7 or  
400/415 V, code N7  
220/230 V, code M7

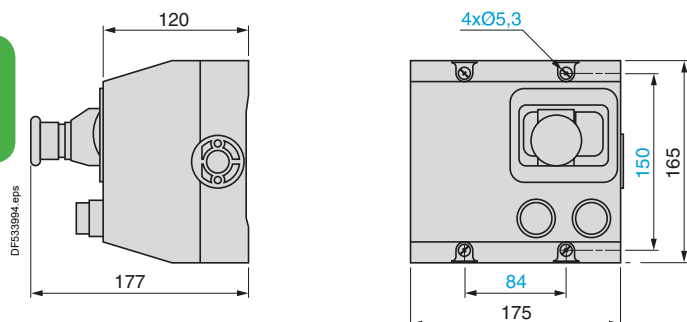




#### Dimensions

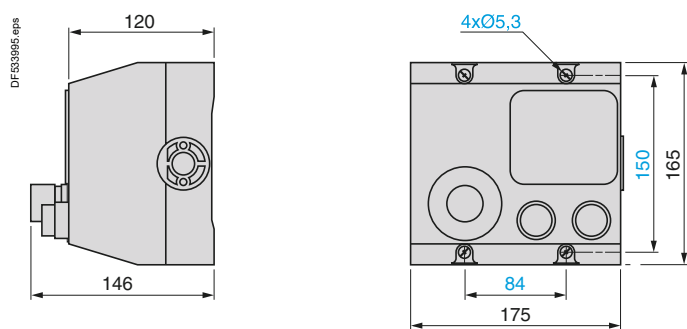
##### LJ7K06, LJ8K06

Enclosed  
starters



##### LJ7K09, LJ8K09

Ref.

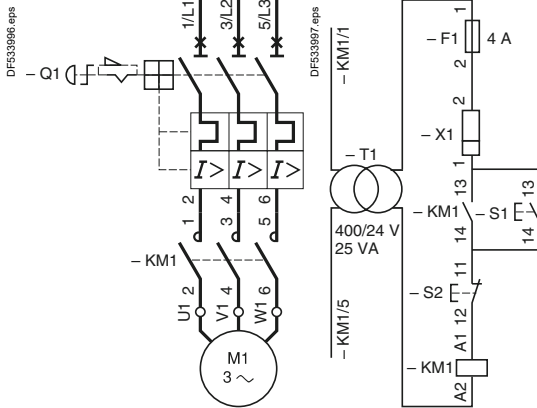


Cut-outs or blanking plugs for cable glands at the top and at the bottom 2 x 13 P and 2 x 16 P.

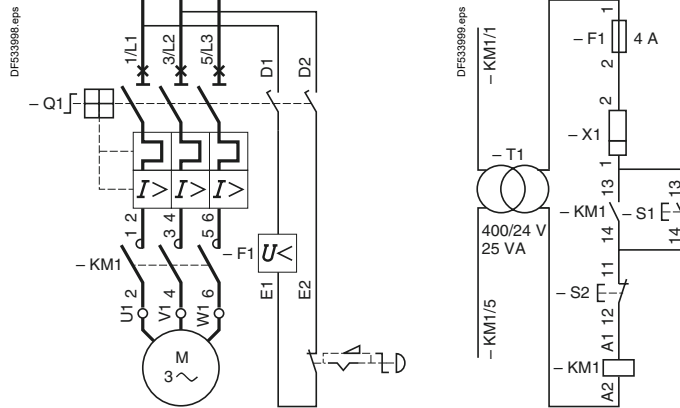


#### Schemes

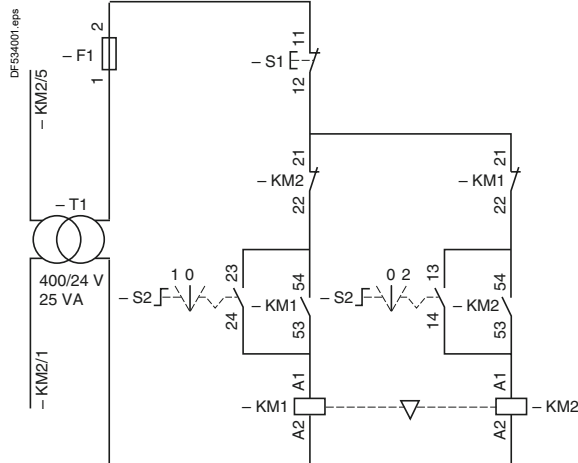
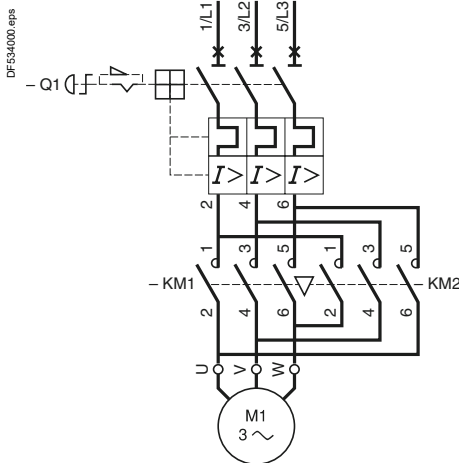
##### LJ7K06



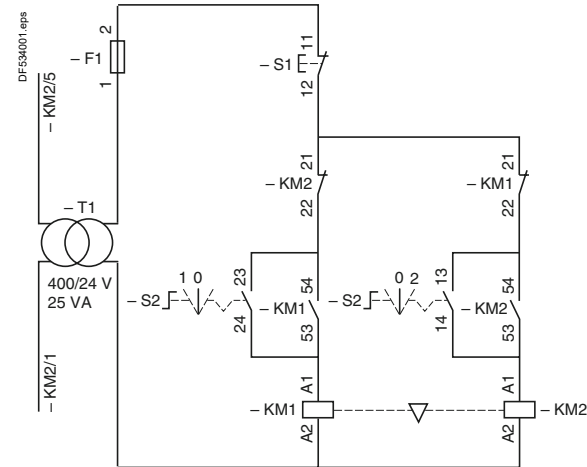
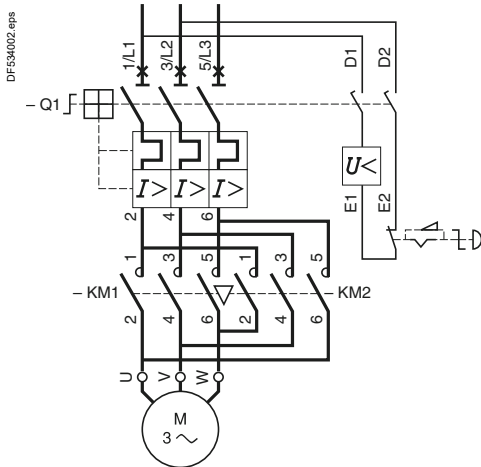
##### LJ7K09



##### LJ8K06




##### LJ8K09









Direct-on-line and reversing starters			
Composition	Range		Page
Motor circuit breaker + contactor (direct-on-line) Coordination type 1	Up to 5.5 kW		A2/2
Motor circuit breaker + 2 contactors (reversing) Coordination type 1	Up to 5.5 kW		A2/3
Motor circuit breaker + contactor (direct-on-line) Coordination type 1	Up to 15 kW		A2/4
Motor circuit breaker + 2 contactors (reversing) Coordination type 1	Up to 15 kW		A2/5
Motor circuit breaker + contactor (direct-on-line) Coordination type 2	Up to 30 kW		A2/6
Motor circuit breaker + 2 contactors (reversing) Coordination type 2	Up to 30 kW		A2/7
Star-delta starters			
3 contactors + 1 time delay aux. block	Up to 132 kW		A2/8
3 contactors + 1 time delay aux. block + 1 control relay	Up to 315 kW		A2/9
Star-delta starters for customer assembly			
Separated components and mounting kits for suggested motor starter components combinations - on plate or mounting rail	Up to 132 kW		A2/10
Separated components for suggested motor starter combinations - on chassis	Up to 315 kW		A2/14



**D.O.L. starters, non-reversing, from 0.37 to 5.5 kW  
at 400/415 V, type 1 coordination**

This pre-assembled combination comprises:

- 1 motor circuit breaker GV2ME,
- 1 3-pole contactor LC1K,
- 1 combination block GV2AF01.

**Characteristics**

Starter type		GV2		ME06K1	ME07K1	ME08K1	ME10K1	ME14K1	ME16K1
Breaking capacity (I <sub>q</sub> ) <sup>(1)</sup>	Conforming to IEC 60947-4-1	400/415 V	kA	50	50	50	50	50	15
		440 V	kA	50	50	50	50	15	8
		500 V	kA	50	50	50	50	10 (4 kW) 6 (5.5 kW)	6

**References****D.O.L. starters, non-reversing**

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415 V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed <sup>(2)</sup>		
kW	kW	kW	A	A			Basic reference, to be completed by adding the voltage code <sup>(3)</sup>	kg
0.37	0.37	0.37	1...1.6	22.5	GV2ME06	LC1K06	GV2ME06K1●●	0.460
0.55	0.55	0.55						
—	—	0.75						
0.75	0.75	—	1.6...2.5	33.5	GV2ME07	LC1K06	GV2ME07K1●●	0.460
—	1.1	1.1						
1.1	—	1.5	2.5...4	51	GV2ME08	LC1K06	GV2ME08K1●●	0.460
1.5	1.5	2.2						
2.2	2.2	—	4...6.3	78	GV2ME10	LC1K06	GV2ME10K1●●	0.460
—	3	3						
3	—	4	6...10	138	GV2ME14	LC1K09	GV2ME14K1●●	0.460
4	4	5.5						
5.5	5.5	7.5	9...14	170	GV2ME16	LC1K12	GV2ME16K1●●	0.460

**Add-on blocks**

Description	Sold in lots of	Unit reference
Combination block between circuit breaker and contactor	10	GV2AF01

<sup>(1)</sup> The breaking performance of circuit breakers **GV2ME** can be increased by adding a current limiter **GV1L3**, see page B6/21.<sup>(2)</sup> Please consult your Regional Sales Office.<sup>(3)</sup> Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	110	220/230	230	230/240	380/400
~ 50/60 Hz	B7	F7	M7	P7	U7	Q7
— <sup>(4)</sup>	BW3	—	—	—	—	—

<sup>(4)</sup> Coil: low consumption (1.5 W), wide range (0.7...1.3 U<sub>c</sub>) with integral suppression device as standard.

PB111904.eps



GV2ME10K1●●



## D.O.L. starters, reversing, from 0.37 to 5.5 kW at 400/415 V, type 1 coordination

This pre-assembled combination comprises:

- 1 motor circuit breaker GV2ME,
- 1 3-pole reversing contactor LC2K,
- 1 combination block GV2AF01.

Open  
pre-cabled  
motor  
starters

### Characteristics

Starter type	GV2	ME06K2	ME07K2	ME08K2	ME10K2	ME14K2	ME16K2
Breaking capacity (Iq) (1)	Conforming to IEC 60947-4-1						
	400/415 V	kA	50	50	50	50	15
	440 V	kA	50	50	50	50	15
	500 V	kA	50	50	50	50	10 (4 kW) 6 (5.5 kW)

### References



GV2ME10K2●●

#### D.O.L. starters, reversing

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415 V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed (2)		
kW	kW	kW	A	A			Basic reference, to be completed by adding the voltage code (3)	kg
0.37	0.37	0.37	1...1.6	22.5	GV2ME06	LC2K06	GV2ME06K2●●	0.460
0.55	0.55	0.55						
—	—	0.75						
0.75	0.75	—	1.6...2.5	33.5	GV2ME07	LC2K06	GV2ME07K2●●	0.460
—	1.1	1.1						
1.1	—	1.5	2.5...4	51	GV2ME08	LC2K06	GV2ME08K2●●	0.460
1.5	1.5	2.2						
2.2	—	—	4...6.3	78	GV2ME10	LC2K06	GV2ME10K2●●	0.460
—	3	3						
3	—	4	6...10	138	GV2ME14	LC2K09	GV2ME14K2●●	0.460
4	4	5.5						
5.5	5.5	7.5	9...14	170	GV2ME16	LC2K12	GV2ME16K2●●	0.460

#### Add-on blocks

Description	Sold in lots of	Unit reference
Combination block between circuit breaker and contactor	10	GV2AF01

(1) The breaking performance of circuit breakers **GV2ME** can be increased by adding a current limiter **GV1L3**, see page B6/21.

(2) Please consult your Regional Sales Office.

(3) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	110	220/230	230	230/240	380/400
~ 50/60 Hz	B7	F7	M7	P7	U7	Q7
— (4)	BW3	—	—	—	—	—

(4) Coil: low consumption (1.5 W), wide range (0.7...1.3 Uc) with integral suppression device as standard.

**Note:** The combinations are valid for IE2 motors and IE3 with maximum starting current = 7.5 x motor rating current (see pages A6/4 and A6/5).



## D.O.L. starters, non-reversing, from 0.06 to 15 kW at 400/415 V, type 1 coordination

This pre-assembled combination comprises:

- 1 motor circuit breaker GV2ME,
- 1 3-pole contactor LC1D,
- 1 combination block GV2AF3.

### Characteristics

Starter type		GV2		DM102 to DM110	DM114	DM116	DM120	DM121	DM122	DM132
Breaking capacity (Iq) (1)	Conforming to IEC 60947-4-1	400/415 V	kA	50	50	15	15	15	15	10
		440 V	kA	50	15	8	8	6	6	6
		500 V	kA	50	6	6	6	4	4	4

### References

#### D.O.L. starters, non-reversing

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415 V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed (2)		
kW	kW	kW	A	A			Basic reference, to be completed by adding the voltage code (2)	kg
0.06	0.06	—	0.16...0.25	2.4	GV2ME02	LC1D09●●	GV2DM102●● (3)	0.596
0.09	0.09	—	0.25...0.40	5	GV2ME03	LC1D09●●	GV2DM103●● (3)	0.596
—	0.12	—	—	—	—	—	—	—
0.12	—	—	0.40...0.63	8	GV2ME04	LC1D09●●	GV2DM104●● (3)	0.596
0.18	0.18	—	—	—	—	—	—	—
0.25	0.25	—	0.63...1	13	GV2ME05	LC1D09●●	GV2DM105●● (3)	0.596
0.37	0.37	—	—	—	—	—	—	—
—	—	0.37	1...1.6	22.5	GV2ME06	LC1D09●●	GV2DM106●● (3)	0.596
0.55	0.55	0.55	—	—	—	—	—	—
—	—	0.75	—	—	—	—	—	—
0.75	0.75	—	1.6...2.5	33.5	GV2ME07	LC1D09●●	GV2DM107●● (3)	0.596
—	1.1	1.1	—	—	—	—	—	—
1.1	—	1.5	2.5...4	51	GV2ME08	LC1D09●●	GV2DM108●● (3)	0.596
1.5	1.5	2.2	—	—	—	—	—	—
2.2	2.2	—	4...6.3	78	GV2ME10	LC1D09●●	GV2DM110●● (3)	0.596
—	3	3	—	—	—	—	—	—
3	—	4	6...10	138	GV2ME14	LC1D09●●	GV2DM114●● (3)	0.596
4	4	5.5	—	—	—	—	—	—
5.5	5.5	7.5	9...14	170	GV2ME16	LC1D12●●	GV2DM116●●	0.601
7.5	7.5	—	13...18	223	GV2ME20	LC1D18●●	GV2DM120●●	0.606
—	9	9	—	—	—	—	—	—
9	11	11	17...23	327	GV2ME21	LC1D25●●	GV2DM121●●	0.646
11	—	15	20...25	327	GV2ME22	LC1D25●●	GV2DM122●●	0.646
15	15	18.5	24...32	416	GV2ME32	LC1D32●●	GV2DM132●●	0.651

#### Add-on blocks

Description	Mounting of GV2	Sold in lots of	Unit reference
Combination block between circuit breaker and contactor	└ rail	10	GV2AF3
	Mounting plate LAD 311	10	GV2AF4

(1) The breaking performance of circuit breakers **GV2ME** can be increased by adding a current limiter **GV1L3**, see page B6/21.

(2) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	220	230
~ 50/60 Hz	B7	M7	P7
— (4)	BD	—	—

(3) Type 2 coordination also possible, see page A6/10.

(4) Only available for **GV2DM**. Coil with integral suppression device as standard.

**Note:** The combinations are valid for IE2 motors and IE3 with maximum starting current = 7.5 x motor rating current (see pages A6/4 and A6/5).

102871\_SE.eps



GV2DM102●●



## D.O.L. starters, reversing, from 0.06 to 15 kW at 400/415 V, type 1 coordination

This pre-assembled combination comprises:

- 1 motor circuit breaker GV2 ME,
- 1 3-pole reversing contactor LC2 D,
- 1 combination block GV2AF3.

### Characteristics

Starter type		GV2		DM202 to DM210	DM214	DM216	DM220	DM221	DM222	DM232
Breaking capacity (Iq) (1)	Conforming to IEC 60947-4-1	400/415 V	kA	50	50	15	15	15	15	10
		440 V	kA	50	15	8	8	6	6	6
		500 V	kA	50	10	6	6	4	4	4

### References

#### D.O.L. starters, reversing<sup>(2)</sup>

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed <sup>(3)</sup>		
kW	kW	kW	A	A			Basic reference, to be completed by adding the voltage code <sup>(4)</sup>	kg
0.06	0.06	—	0.16...0.25	2.4	GV2ME02	LC2D09●●	GV2DM202●●	0.963
0.09	0.09	—	0.25...0.40	5	GV2ME03	LC2D09●●	GV2DM203●●	0.963
—	0.12	—	—	—	—	—	—	—
0.12	—	—	0.40...0.63	8	GV2ME04	LC2D09●●	GV2DM204●●	0.963
0.18	0.18	—	—	—	—	—	—	—
0.25	0.25	—	0.63...1	13	GV2ME05	LC2D09●●	GV2DM205●●	0.963
0.37	0.37	—	—	—	—	—	—	—
—	—	0.37	1...1.6	22.5	GV2ME06	LC2D09●●	GV2DM206●●	0.963
0.55	0.55	0.55	—	—	—	—	—	—
—	—	0.75	—	—	—	—	—	—
0.75	0.75	—	1.6...2.5	33.5	GV2ME07	LC2D09●●	GV2DM207●●	0.963
—	1.1	1.1	—	—	—	—	—	—
1.1	—	1.5	2.5...4	51	GV2ME08	LC2D09●●	GV2DM208●●	0.963
1.5	1.5	2.2	—	—	—	—	—	—
2.2	2.2	—	4...6.3	78	GV2ME10	LC2D09●●	GV2DM210●●	0.963
—	3	3	—	—	—	—	—	—
3	—	4	6...10	138	GV2ME14	LC2D09●●	GV2DM214●●	0.963
4	4	5.5	—	—	—	—	—	—
5.5	5.5	7.5	9...14	170	GV2ME16	LC2D12●●	GV2DM216●●	0.973
7.5	7.5	—	13...18	223	GV2ME20	LC2D18●●	GV2DM220●●	0.983
—	9	9	—	—	—	—	—	—
9	11	11	17...23	327	GV2ME21	LC2D25●●	GV2DM221●●	1.063
11	—	15	20...25	327	GV2ME22	LC2D25●●	GV2DM222●●	1.063
15	15	18.5	24...32	416	GV2ME32	LC2D32●●	GV2DM232●●	1.073

#### Add-on blocks

Description	Mounting of GV2	Sold in lots of	Unit reference
Combination block between circuit breaker and contactor	rail	10	GV2AF3
	Mounting plate LAD 311	10	GV2AF4

(1) The breaking performance of circuit breakers GV2ME can be increased by adding a current limiter GV1L3, see page B6/21.

(2) Type 2 coordination also possible, see page B6/21.

(3) See page B8/8.

(4) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	220	230
~ 50/60 Hz	B7	M7	P7
— <sup>(5)</sup>	BD	—	—

(5) Coil with integral suppression device as standard.

**Note:** The combinations are valid for IE2 motors and IE3 with maximum starting current = 7.5 x motor rating current (see pages A6/4 and A6/5).

PB1142/13 eps



GV2DM202●●

Open pre-cabled motor starters





## D.O.L. starters, non-reversing, from 0.06 to 30 kW at 400/415 V, type 2 coordination

This pre-assembled combination comprises:

- 1 motor circuit breaker GV2P,
- 1 3-pole contactor LC1D,
- 1 combination block GV2AF3.

### Characteristics

Starter type		GV2		DP102 to DP110	DP114	DP116	DP120	DP121	DP122	DP132
Breaking capacity (I <sub>q</sub> ) <sup>(1)</sup>	Conforming to IEC 60947-4-1	400/415 V	kA	130	130	130	50	50	50	50
		440 V	kA	130	130	50	20	20	20	20
		500 V	kA	130	50	42	10	10	10	10

### References

#### D.O.L. starters, non-reversing

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415 V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed <sup>(2)</sup>		
kW	kW	kW	A	A			Basic reference, to be completed by adding the voltage code <sup>(3)</sup>	kg
0.06	0.06	—	0.16...0.25	2.4	GV2P02	LC1D09●●	GV2DP102●●	0.686
—	0.09	—	0.25...0.40	5	GV2P03	LC1D09●●	GV2DP103●●	0.686
0.09	0.12	—	—	—	—	—	—	—
0.12	—	—	0.40...0.63	8	GV2P04	LC1D09●●	GV2DP104●●	0.686
0.18	0.18	—	—	—	—	—	—	—
0.25	0.25	—	0.63...1	13	GV2P05	LC1D09●●	GV2DP105●●	0.686
0.37	0.37	—	—	—	—	—	—	—
—	—	0.37	1...1.6	22.5	GV2P06	LC1D09●●	GV2DP106●●	0.686
0.55	0.55	0.55	—	—	—	—	—	—
—	—	0.75	—	—	—	—	—	—
0.75	0.75	—	1.6...2.5	33.5	GV2P07	LC1D09●●	GV2DP107●●	0.686
—	1.1	1.1	—	—	—	—	—	—
1.1	—	1.5	2.5...4	51	GV2P08	LC1D09●●	GV2DP108●●	0.696
1.5	1.5	2.2	—	—	—	—	—	—
2.2	2.2	—	4...6.3	78	GV2P10	LC1D09●●	GV2DP110●●	0.736
—	3	3	—	—	—	—	—	—
3	—	4	6...10	138	GV2P14	LC1D09●●	GV2DP114●●	0.736
4	4	5.5	—	—	—	—	—	—
5.5	5.5	7.5	9...14	170	GV2P16	LC1D25●●	GV2DP116●●	0.741
—	7.5	9	—	—	—	—	—	—
7.5	9	—	13...18	223	GV2P20	LC1D25●●	GV2DP120●●	0.736
9	11	11	17...23	327	GV2P21	LC1D25●●	GV2DP121●●	0.741
11	—	15	20...25	327	GV2P22	LC1D25●●	GV2DP122●●	0.741
15	15	18.5	24...32	416	GV2P32	LC1D32●●	GV2DP132●●	0.741
18.5	—	—	30...40	560	GV3P401 <sup>(4)</sup>	LC1D50A●●	—	1.725
—	18.5	22	30...40	560	GV3P401 <sup>(4)</sup>	LC1D65A●●	—	1.730
22	—	—	37...50	700	GV3P501 <sup>(4)</sup>	LC1D50A●●	—	1.725
—	22	30	37...50	700	GV3P501 <sup>(4)</sup>	LC1D65A●●	—	1.730
30	37	—	48...65	910	GV3P651 <sup>(4)</sup>	LC1D65A●●	—	1.730

#### Add-on blocks

Description	Mounting of GV2	Sold in lots of 10	Unit reference
Combination block between circuit breaker and contactor	└┐ rail	10	GV2AF3
(1) The breaking performance of circuit breakers GV2P can be increased by adding a current limiter GV1L3, see page B6/11.			
(2) See page B8/8.			
(3) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):			
<b>Volts</b>	<b>24</b>	<b>220</b>	<b>230</b>
~ 50/60 Hz	B7	M7	P7
— <sup>(5)</sup>	BD	—	—

(4) Circuit breaker supplied without downstream EverLink® power terminal block, which is required for vertical mounting. For side by side mounting, use a GV3P circuit breaker with terminal blocks and the GV3S set of S-shape busbars (see page B8/28).

(5) Coil with integral suppression device as standard.

**Note:** The combinations are valid for IE2 motors and IE3 with maximum starting current = 7.5 x motor rating current (see pages A6/4 and A6/5).



## D.O.L. starters, reversing, from 0.06 to 30 kW at 400/415 V, type 2 coordination

This pre-assembled combination comprises:

- 1 motor circuit breaker GV2P,
- 1 3-pole reversing contactor LC2D,
- 1 combination block GV2AF3.

### Characteristics

Starter type		GV2		DP202 to DP210	DP214	DP216	DP220	DP221	DP222	DP232
Breaking capacity (I <sub>q</sub> ) (1)	Conforming to IEC 60947-4-1	400/415 V	kA	130	130	130	50	50	50	50
		440 V	kA	130	130	50	20	20	20	20
		500 V	kA	130	50	42	10	10	10	10

### References

#### D.O.L. starters, reversing

Standard power ratings of 3-phase motors 50/60 Hz in AC-3			Setting range of thermal trips	Fixed magnetic tripping current 13 Irth	For customer assembly		Pre-assembled	Weight
400/415 V	440 V	500 V			Motor circuit-breaker Reference	Contactor Reference to be completed <sup>(2)</sup>		
kW	kW	kW	A	A			Basic reference, to be completed by adding the voltage code <sup>(3)</sup>	kg
0.06	0.06	—	0.16...0.25	2.4	GV2P02	LC2D09●●	GV2DP202●●	1.053
—	0.09	—	0.25...0.40	5	GV2P03	LC2D09●●	GV2DP203●●	1.053
0.09	0.12	—	0.40...0.63	8	GV2P04	LC2D09●●	GV2DP204●●	1.053
0.12	—	—	0.63...1	13	GV2P05	LC2D09●●	GV2DP205●●	1.053
0.18	0.18	—	—	—	—	—	—	—
0.25	0.25	—	1...1.6	22.5	GV2P06	LC2D09●●	GV2DP206●●	1.053
0.37	0.37	—	1.6...2.5	33.5	GV2P07	LC2D09●●	GV2DP207●●	1.053
—	—	0.37	2.5...4	51	GV2P08	LC2D09●●	GV2DP208●●	1.073
0.55	0.55	0.55	4...6.3	78	GV2P10	LC2D09●●	GV2DP210●●	1.153
—	—	0.75	6...10	138	GV2P14	LC2D09●●	GV2DP214●●	1.153
0.75	0.75	—	9...14	170	GV2P16	LC2D25●●	GV2DP216●●	1.163
—	1.1	1.1	13...18	223	GV2P20	LC2D25●●	GV2DP220●●	1.153
1.1	—	1.5	17...23	327	GV2P21	LC2D25●●	GV2DP221●●	1.163
1.5	1.5	2.2	20...25	327	GV2P22	LC2D25●●	GV2DP222●●	1.163
2.2	2.2	—	24...32	416	GV2P32	LC2D32●●	GV2DP232●●	1.163
—	3	3	30...40	560	GV3P401 <sup>(4)</sup>	LC2D50A●●	—	2.750
3	—	4	30...40	560	GV3P401 <sup>(4)</sup>	LC2D65A●●	—	2.760
4	4	5.5	37...50	700	GV3P501 <sup>(4)</sup>	LC2D50A●●	—	2.750
5.5	5.5	7.5	37...50	700	GV3P501 <sup>(4)</sup>	LC2D65A●●	—	2.760
—	7.5	9	48...65	910	GV3P651 <sup>(4)</sup>	LC2D65A●●	—	2.760

#### Add-on blocks

Description	Mounting of GV2	Sold in lots of	Unit reference
Combination block between circuit breaker and contactor	└┐ rail	10	GV2AF3
<sup>(1)</sup> The breaking performance of circuit breakers GV2P can be increased by adding a current limiter GV1L3, see page B6/11.			
<sup>(2)</sup> See page B8/8.			
<sup>(3)</sup> Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):			
<b>Volts</b>	<b>24</b>	<b>220</b>	<b>230</b>
~ 50/60 Hz	B7	M7	P7
— <sup>(5)</sup>	BD	—	—

<sup>(4)</sup> Circuit breaker supplied without downstream EverLink® power terminal block, which is required for vertical mounting. For side by side mounting, use a GV3P circuit breaker with terminal blocks and the GV3S set of S-shape busbars (see page B8/28).

<sup>(5)</sup> Coil with integral suppression device as standard.

**Note:** The combinations are valid for IE2 motors and IE3 with maximum starting current = 7.5 x motor rating current (see pages A6/4 and A6/5).



GV2DP202●●



GV3P651  
+  
LC2D65A●●

















LC3D32A●●

## Plate mounted starters without isolating device

Maximum operating rate: 30 starts/hour. Maximum starting time: 30 seconds.

Standard power ratings of squirrel cage motors Mains voltage - delta connection				Auxiliary contacts available on each contactor						Star delta mechanical interlock	Basic reference, to be completed by adding the voltage code <sup>(2)</sup>	Weight
220/230 V	380/400 V	415 V	440 V	line KM2	delta KM3	star KM1						
												
kW	kW	kW	kW									kg
4	7.5	7.5	7.5	—	—	—	— <sup>(3)</sup>	—	1	With	LC3D09A●●	1.530
5.5	11	11	11	—	—	—	— <sup>(3)</sup>	—	1	With	LC3D12A●●	1.530
11	18.5	22	22	—	—	—	— <sup>(3)</sup>	—	1	With	LC3D18A●●	1.730
15	25	30	30	—	—	—	— <sup>(3)</sup>	—	1	With	LC3D32A●●	2.030
37	75	75	75	—	1	1	— <sup>(3)</sup>	—	— <sup>(3)</sup>	Without With	LC3D80●● LC3D80●●A64	5.200 5.400
63	110	110	110	—	1	1	— <sup>(3)</sup>	—	— <sup>(3)</sup>	Without With	LC3D115●● <sup>(4)</sup> LC3D115●●A64 <sup>(4)</sup>	11.800 12.100
75	132	132	147	—	1	1	— <sup>(3)</sup>	—	1 <sup>(3)</sup>	Without With	LC3D150●● <sup>(4)</sup> LC3D150●●A64 <sup>(4)</sup>	12.100 12.100

## Rail mounted starters (35 mm rail) without isolating device

Standard power ratings of squirrel cage motors Mains voltage - delta connection				Auxiliary contacts available on each contactor						Star delta mechanical interlock	Basic reference, to be completed by adding the voltage code <sup>(2)</sup>	Weight		
220/230 V	380/400 V	415 V	440 V	line KM2		delta KM3		star KM1						
														
kW	kW	kW	kW											kg
Maximum operating rate: 12 starts/hour. Maximum starting time: 30 seconds.														
3	5.5	5.5	5.5	—	—	—	—	—	1	With	LC3K06●●	0.740		
4	7.5	7.5	7.5	—	—	—	—	—	1	With	LC3K09●●	0.740		
Maximum operating rate: 30 starts/hour. Maximum starting time: 30 seconds														
4	7.5	7.5	7.5	—	—	—	— <sup>(3)</sup>	—	1	With	LC3D090A●●	1.530		
5.5	11	11	11	—	—	—	— <sup>(3)</sup>	—	1	With	LC3D120A●●	1.530		
11	18.5	22	22	—	—	—	— <sup>(3)</sup>	—	1	With	LC3D180A●●	1.730		
15	25	30	30	—	—	—	— <sup>(3)</sup>	—	1	With	LC3D320A●●	2.030		

<sup>(1)</sup> Protection must be provided by the addition of a thermal overload relay, to be ordered separately. Select appropriate overload relay for setting at 0.58 of the full load rated motor current (see pages B11/4 and B11/5).

<sup>(2)</sup> Standard control circuit voltages:

Volts ~ 50/60 Hz      24      36      42      48      110      220      230      240      380      400      415      440

Star-delta starters LC3K06 and K09

Code      B7      C7      D7      E7      F7      M7      P7      U7      —      —      —      —

Star-delta starters LC3D09A...D150, LC3D090A...D320A

Code      B7      —      D7      E7      F7      M7      P7      U7      Q7      V7      N7      R7

For other voltages, please consult your Regional Sales Office.

<sup>(3)</sup> One auxiliary contact block type LADN can also be fitted, see page B8/22.

<sup>(4)</sup> These starters consist of contactors LC1D115 or D150 without connectors.



### Pre-assembled starters without isolating device

Maximum operating rate: 12 starts/hour.

Maximum starting time:

LC3F●●●●●: 20 seconds.







LC3F●●●●●A64: 30 seconds (3 identical contactors).

**Composition of starters without mechanical interlock**, see pages A2/14, A2/15.

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LC3F115M7

Star-delta starters													
Standard power ratings of squirrel cage motors Mains voltage - delta connection				Auxiliary contacts available on each contactor						Star delta mechanical interlock	Basic reference, to be completed by adding the voltage code <sup>(2)</sup>	Weight	
				line		delta		star					
220/230 V	380/400 V	415 V	440 V										
										<sup>(3)</sup>			
kW	kW	kW	kW									kg	
90	160	160	185	1	2	2	1	1	1	Without	LC3F185●●	16.500	
										With	LC3F185●●A64	16.625	
100	200	200	220	1	2	2	1	1	1	Without	LC3F225●●	16.500	
										With	LC3F225●●A64	16.625	
110	220	220	250	1	2	2	1	1	1	Without	LC3F265●●	27.300	
										With	LC3F265●●A64	27.425	
160	280	280	315	1	2	2	1	1	1	Without	LC3F330●●	37.000	
										With	LC3F330●●A64	37.125	
185	315	355	375	1	2	2	1	1	1	Without	LC3F400●●	37.000	
										With	LC3F400●●A64	37.125	

(1) Protection must be provided by the addition of a thermal overload relay, to be ordered separately. Select appropriate overload relay for setting at 0.58 of the full load rated motor current, see pages B11/11 and B11/12.

(2) Standard control circuit voltages:

Volts ~ 50/60 Hz	48	110	115	220/230	230	240	380/400	400	415
Code	E7	F7	FE7	M7	P7	U7	Q7	V7	N7

For other voltages, please consult your Regional Sales Office.

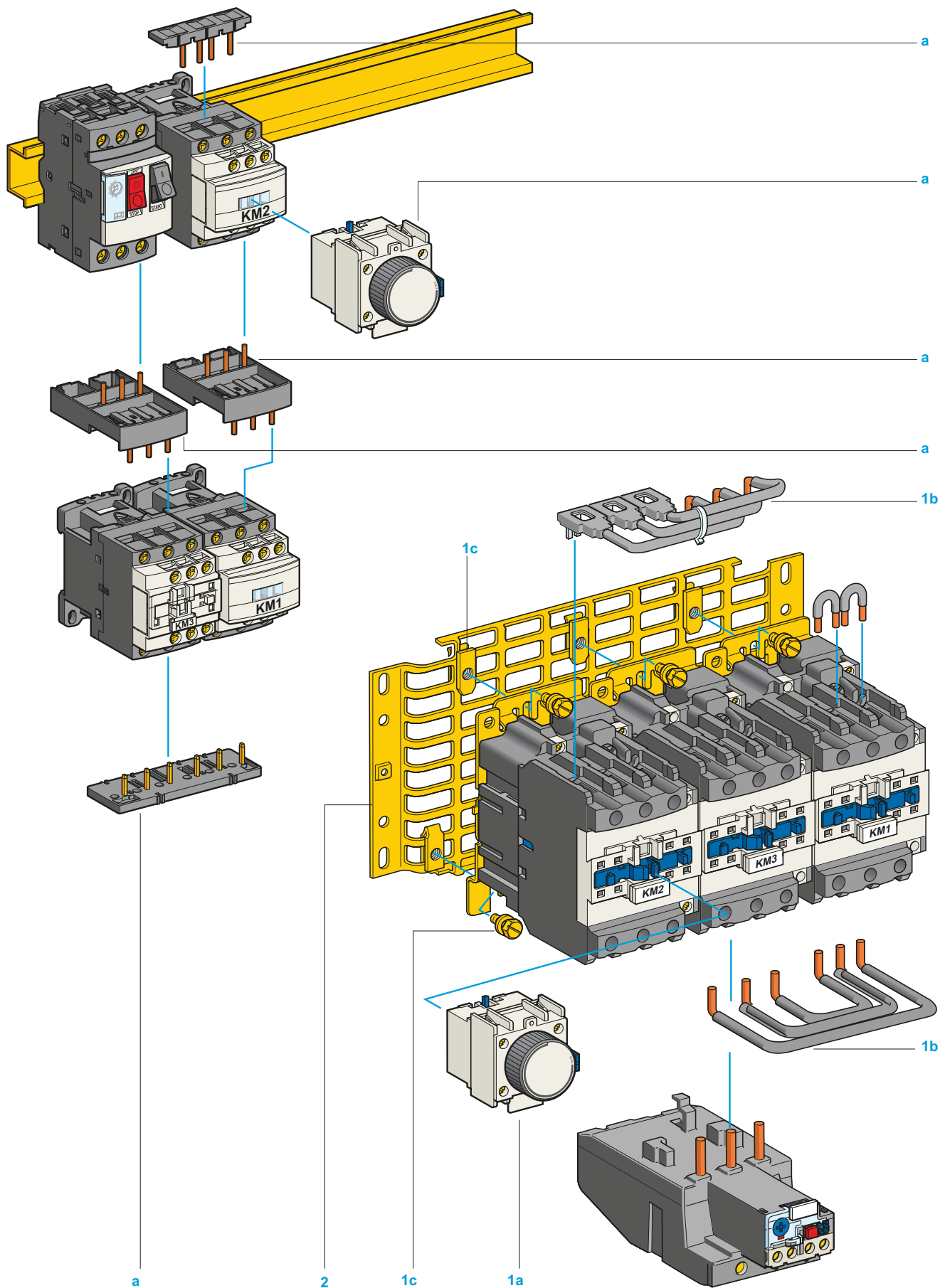
(3) One auxiliary contact block type **LADN** can be fitted.

Open  
re-cabled  
motor  
starters





Open  
pre-cabled  
motor  
starters





## Star-delta starters without mechanical interlock, for customer assembly on plate or on mounting rail <sup>(2)</sup>

### Starters for direct combination with a circuit breaker

Maximum operating rate: 30 starts/hour. Maximum starting time: 30 seconds

Standard power ratings of squirrel cage motors <sup>(3)</sup> Mains voltage - delta connection		Thermal-magnetic motor circuit breaker <i>References in italics are available in CEE zone only</i>	Contactors (basic references, to be completed by adding the voltage code) <sup>(4)</sup>		
400/ 415 V	440 V		line	delta	star
kW	kW		KM2	KM3	KM1
7.5	7.5	GV2ME20 or GV2ME20AP	LC1D09●●	LC1D09●●	LC1D09●●
–	9	GV2ME20 or GV2ME20AP	LC1D12●●	LC1D12●●	LC1D09●●
9	11	GV2ME21 or GV2ME21AP	LC1D12●●	LC1D12●●	LC1D09●●
11	–	GV2ME22 or GV2ME22AP	LC1D12●●	LC1D12●●	LC1D09●●
15	15	GV2ME32 or GV2ME32AP	LC1D18●●	LC1D18●●	LC1D09●●

### Separate component

Description	Illustration item no.	Reference
Mounting kit comprising: power circuit connections and 1 time delay contact block LADS2	<a href="#">a</a>	LAD912GV

### Starters for mounting separately from upstream protection

Maximum operating rate: 30 starts/hour. Maximum starting time: 30 seconds.

Standard power ratings of squirrel cage motors <sup>(3)</sup> Mains voltage - delta connection				Contactors (basic references, to be completed by adding the voltage code) <sup>(4)</sup>			Separate components (see below)
220/ 230 V	380/ 400 V	415 V	440 V	line	delta	star	Component types
kW	kW	kW	kW	KM2	KM3	KM1	
4	7.5	7.5	7.5	LC1D09●●	LC1D09●●	LC1D09●●	D09
5.5	11	11	11	LC1D18●● <sup>(6)</sup>	LC1D12●●	LC1D09●●	D12
11	18.5	22	22	LC1D25●● <sup>(7)</sup>	LC1D25●● <sup>(7)</sup>	LC1D09●●	D18
15	25	30	30	LC1D32●●	LC1D32●●	LC1D18●●	D32
18.5	37	37	37	LC1D40A●●	LC1D40A●●	LC1D40A●●	D40
30	55	59	59	LC1D50A●●	LC1D50A●●	LC1D40A●●	D50
37	75	75	75	LC1D80●●	LC1D80●●	LC1D50A●●	D80
63	110	110	110	LC1D115●●	LC1D115●●	LC1D80●●	D115 <sup>(5)</sup>
75	132	132	147	LC1D150●●	LC1D150●●	LC1D115●●	D150 <sup>(5)</sup>

### Separate components

Description	Illustration item no.	For components type <sup>(5)</sup>	Reference	Without timer LADS2
Mounting kit comprising: - 1 time delay contact block LADS2 (D09...D80) <sup>(3)</sup> , - power circuit connections (D09...D80), - screws and clamps for fixing contactors to the plate (D40...D80).	<a href="#">1 a</a>	LC1D09 to D38 <sup>(8)</sup>	LAD91217	LAD91218
	<a href="#">1 b</a>	LC1D09 to D38 <sup>(9)</sup>	LAD93217	LAD93218
	<a href="#">1 c</a>	D40 and D50	LA9D5017	–
		D80	LA9D8017	–
Equipment mounting plates	<a href="#">2</a>	LC1D09 to D38	LA9D12974	
		D40 and D50	LA9D40973	
		D80	LA9D80973	

<sup>(1)</sup> Protection must be provided by the addition of a thermal overload relay, to be ordered separately.

Select appropriate overload relay for setting at 0.58 of the full load rated motor current, see pages B11/4 and B11/5.

<sup>(2)</sup> For mounting, assembly and cabling: please refer to installation instructions supplied with the equipment.

<sup>(3)</sup> See comments on page A2/24.

<sup>(4)</sup> See page B8/8.

<sup>(5)</sup> For D115 and D150 components, see illustration and separate parts on pages A2/12 and A2/13.

<sup>(6)</sup> A D12 component is adequate for the application, but use of a D18 is recommended.

(connection capacity, correct use of power connection kit and connections).

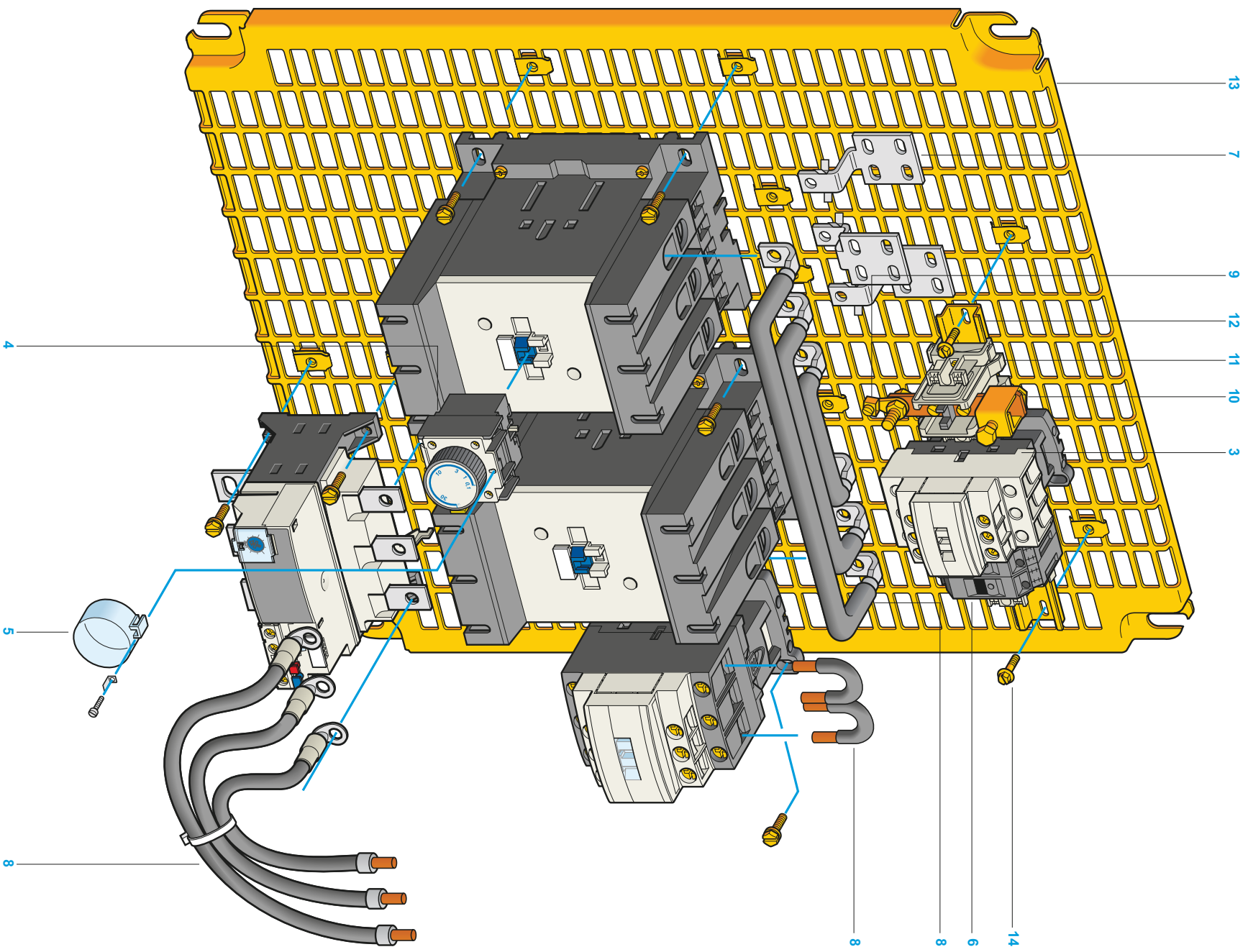
<sup>(7)</sup> A D18 component is adequate for the application, but use of a D25 is recommended.

(connection capacity, correct use of power connection kit and connections).

<sup>(8)</sup> For assembly of 3 contactors of the same physical size (depth).

<sup>(9)</sup> For assembly of 3 contactors with star contactor physically smaller (depth).







#### Starters for mounting separately from upstream protection

##### Separate components (continued)

Description	Illustration item no.	For use on	No.	Sold in lots of	Unit reference	Weight kg
Instantaneous auxiliary contact blocks 1 N/O	1	D115 (star)	1	1	LADN10	0.020
Control relay	3	D115, D150	1	1	CAD32 <sup>(2)</sup>	0.320
Time delay auxiliary contact blocks	4	D115, D150	1	1	LADT2	0.060
Lead sealing kit for time delay auxiliary contact blocks	5	D115, D150	1	1	LA9D901	0.005
Thermal magnetic circuit breaker for control circuit (200...415 V)	6	D115, D150	2	6	GB2CB05	0.060
Set of 3 connectors for wider terminations (optional)	7	D115, D150	1	1	LA9FG980	0.200
Set of power connections with fixing accessories	8	D115	1	1	LA9D11517	0.800
		D150	1	1	LA9D15017	1.050
Spare volt free terminals	9	D115, D150	1	10	DZ3HA3	0.007
			2	10	DZ3GA3	0.006
Lug-connector terminal block	10	D115, D150	1	10	AB1BC9535	0.236
End stop	11	D115, D150	3	100	AB1AB8M35	0.005
Mounting rail 35 mm	12	D115, D150	1	10	NSYDPR25	0.210
Pre-slotted mounting plate	13	D115, D150	1	1	AM3PA65	1.950
Screw with captive washer	14	D115, D150	12	100	AF1VA618	0.006
			2	100	AF1VA410	0.002

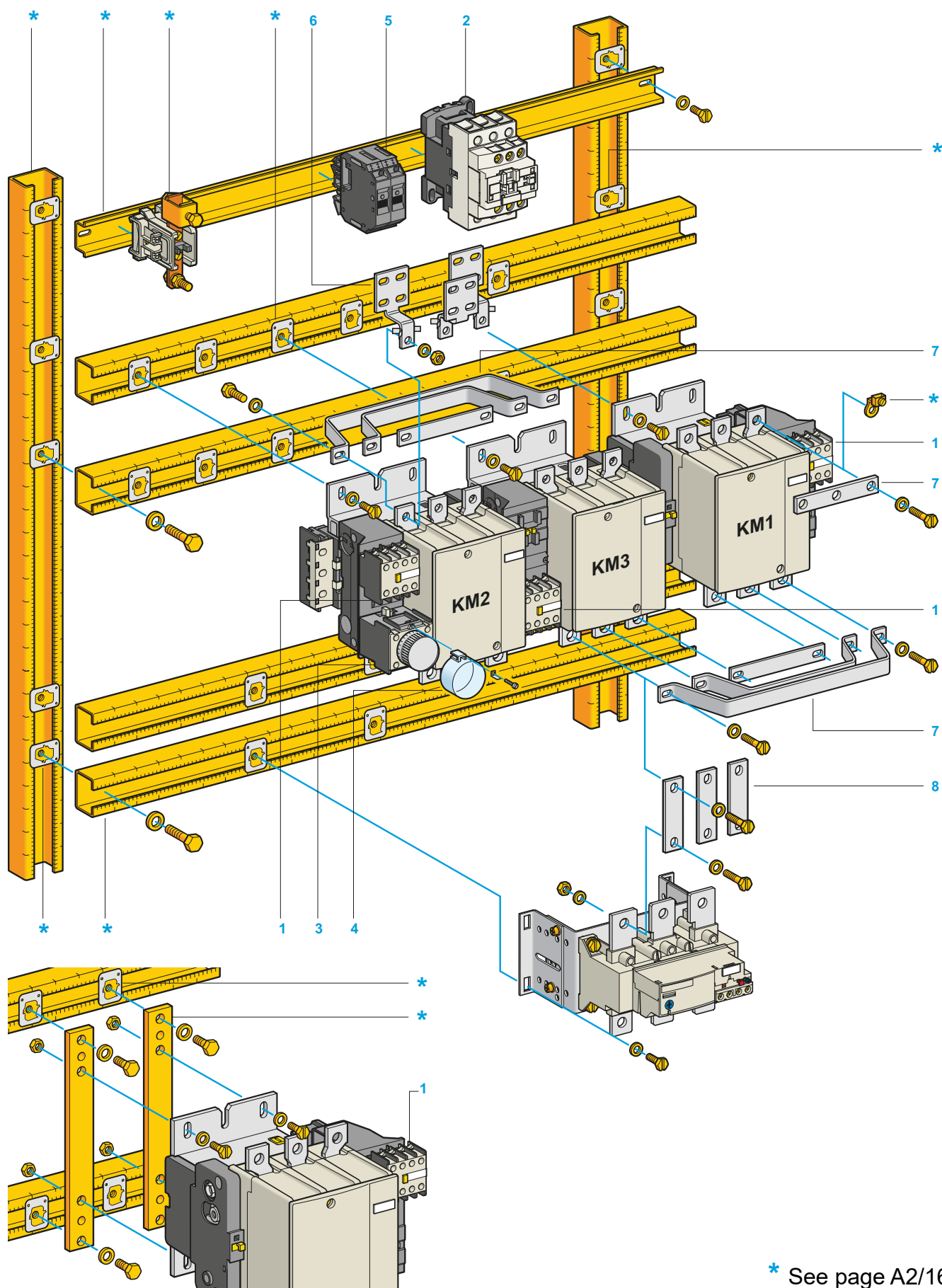
<sup>(1)</sup> Protection must be provided by the addition of a thermal overload relay, to be ordered separately. Select appropriate overload relay for setting at 0.58 of the full load rated motor current, see pages B11/4 and B11/5.

<sup>(2)</sup> For mounting, assembly and cabling: please refer to installation instructions supplied with the equipment.

Open  
pre-cabled  
motor  
starters







\* See page A2/16



## Star-delta starters without mechanical interlock for customer assembly on chassis

Contactors							
Maximum operating rate: 12 starts/hour. Maximum starting time: 20 seconds <sup>(2)</sup>							
Standard power ratings of squirrel cage motors				Contactors <sup>(3)</sup>			Separate components (see below)
220/230V	380/400V	415V	440V	line	delta	star	
kW	kW	kW	kW	KM2	KM3	KM1	Component types
90	160	160	185	LC1F185●●	LC1F185●●	LC1D150●●	F185
100	200	200	220	LC1F225●●	LC1F225●●	LC1F185●●	F225
110	220	220	250	LC1F265●●	LC1F265●●	LC1F185●●	F265
160	280	280	315	LC1F330●●	LC1F330●●	LC1F265●●	F330
185	315	355	375	LC1F400●●	LC1F400●●	LC1F265●●	F400

Separate components <sup>(4)</sup>							
Description	Illustration item no.	For use on	No.	Sold in lots of	Unit reference	Weight kg	
Instantaneous auxiliary contact blocks 2 N/O + 2 N/C	1	F185 to F400	3	1	LADN22	0.050	
Control relay	2	F185 to F400	1	1	CAD32	0.580	
Time delay auxiliary contact blocks	3	F185 to F400	1	1	LADT2	0.060	
Sealing cover	4	F185 to F400	1	1	LA9D901	0.005	
Thermal magnetic circuit breaker for 5 A control circuit	5	F185 to F400	2	6	GB2CB10	0.050	
Sets of 3 connectors for wider terminations (optional)	6	F185	1	1	LA9FG980	0.200	
		F225 to F400	1	1	LA9FJ980	0.490	
Sets of power connections	7	F185	1	1	LA9F18517	0.800	
		F225	1	1	LA9F22510	1.400	
		F265	1	1	LA9FH610	1.400	
		F330 and F400	1	1	LA9FJ610	1.500	
Set of 3 busbars for thermal overload connections	8	F185 to F400	1	1	LA7F●●● (Selected according to size of thermal overload relay) see pages B11/11 and B11/12.		

<sup>(1)</sup> Protection must be provided by the addition of a thermal overload relay, to be ordered separately. Select appropriate overload relay for setting at 0.58 of the full load rated motor current, see pages B11/11 and B11/12.

<sup>(2)</sup> For longer starting times, please consult your Regional Sales Office.

<sup>(3)</sup> Contactors supplied with coil. Complete the reference by adding the control circuit voltage code.

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

LC1D150											
Volts	48	110	115	120	220	230	240	380	400	415	
50/60 Hz	E7	F7	FE7	G7	M7	P7	U7	Q7	V7	N7	

LC1F185 to F400											
Volts	48	110	115	120	220	230	240	380	400	415	
40... 400 Hz <sup>(5)</sup>	E7 <sup>(6)</sup>	F7	FE7	G7	M7	P7	U7	Q7	V7	N7	

Standard voltages, see page B9/2.

For other voltages between 24 and 660 V, see pages B9/17 and B9/18.

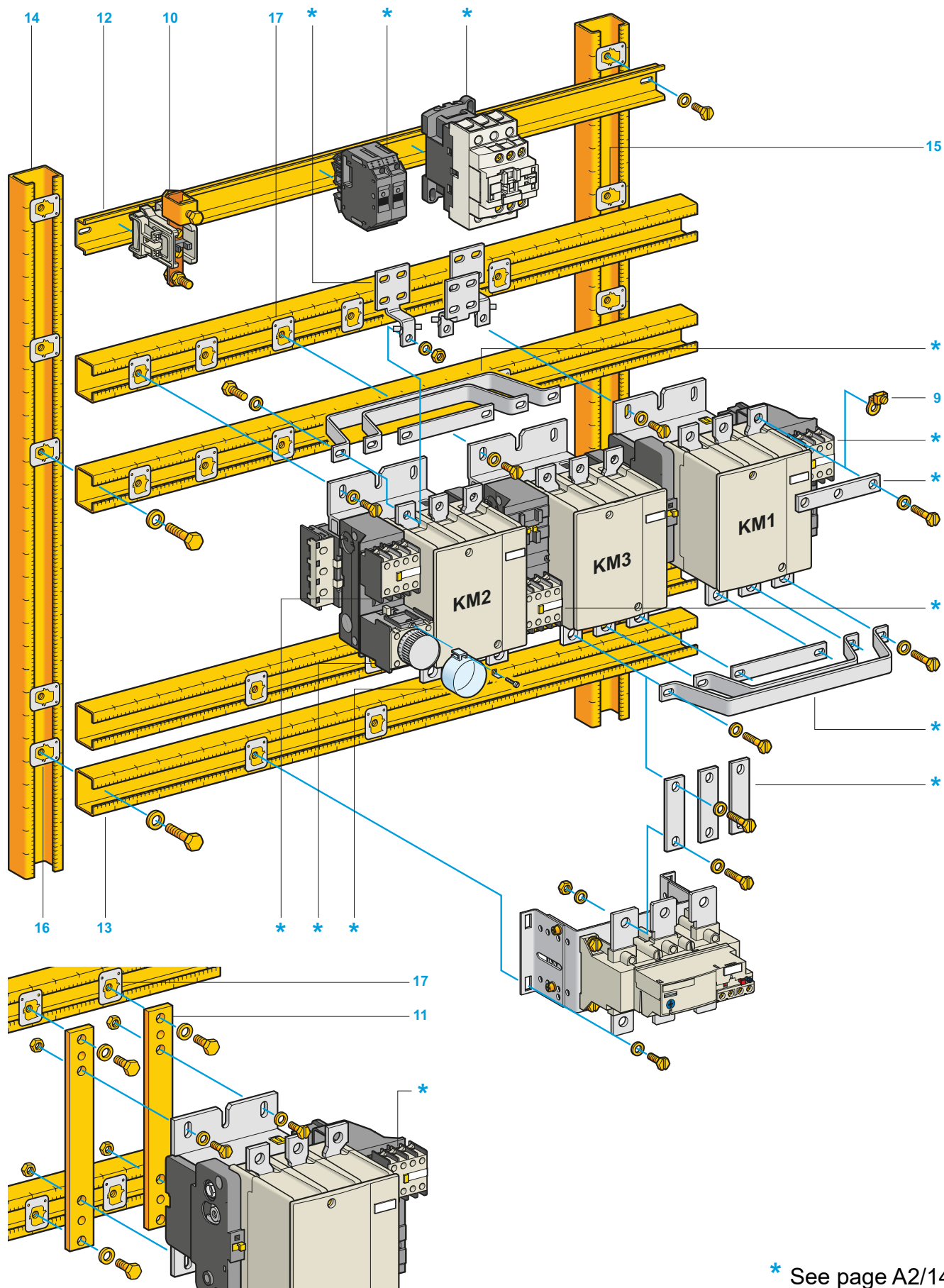
<sup>(4)</sup> Other separate components, see page A2/17.

<sup>(5)</sup> Coil LX1: LC1F265, F330 and F400. Coil LX9: LC1F185 and F225.

<sup>(6)</sup> Except for LC1F400.







\* See page A2/14



Separate components (continued from page A2/15)						
Description	Illustration item no.	For use on	No.	Sold in lots of	Unit reference	Weight kg
Spare volt free terminals	9	F185	3	10	DZ3GA3	0.006
		F225...F400	3	10	DZ3HA3	0.007
Neutral terminals with stop and spare volt free terminal (for control circuit)	10	F185	1	10	AB1BC9535	0.236
			2	100	AB1AB8P35	0.006
			1	10	DZ3HA3	0.007
		F225 and F265	1	10	AB1BC15035	0.277
			2	100	AB1AB8M35	0.007
			1	10	DZ3JA3	0.010
		F330 and F400	1	10	AB1BC24035	0.287
			2	100	AB1AB8M35	0.007
			1	10	DZ3JA3	0.010
Reducer bracket	11	F400	2	1	LA9F100	0.100
Mounting rails <sup>(2)</sup>	12	F185...F400	1	10	NSYSDR200	0.900
	13	F185...F400	1	4	AM1EC200	2.980
Uprights <sup>(2)</sup>	14	F115...F400	2	4	AM1EC200	2.980
1/4 turn sliding clip nuts and corresponding bolts for rails NSYSDR	15	F185...F400	2	10	NSYSNM6	0.020
				100	AF1VA618	0.006
1/4 turn sliding clip nuts and corresponding bolts for rails NSYSDR	16	F185...F400	8	10	NSYSNM8	0.020
				10	AF1VC820	0.024
1/4 turn sliding clip nuts and corresponding bolts for equipment fixing	17	F185...F330	15	10	AF1CD061	0.020
				100	AF1VA618	0.006
				10	AF1CD061	0.020
				10	AF1CD081	0.020
		F400	8	10	AF1CD061	0.020
				10	AF1CD081	0.020
				100	AF1VA618	0.006
				10	AF1VC820	0.024
Enclosures: metal, grey RAL 7032	—	F185...F225	1	1	ACMGV763	19.090
		F265	1	1	ACMGV973	33.310
		F330 and F400	1	1	ACMGV1084	54.000
Fixing lugs adjustable for enclosure ACM	—	—	4	4	AE3FX122	0.080

<sup>(1)</sup> Protection must be provided by the addition of a thermal overload relay, to be ordered separately. Select appropriate overload relay for setting at 0.58 of the full load rated motor current, see pages B11/11 and B11/12.

<sup>(2)</sup> Supplied in 2 m lengths. See page A2/27 for cutting to length.









## Technical Data for Designers

### Contents

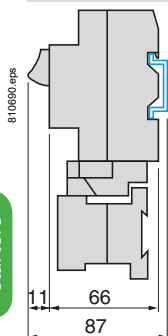
Non-reversing / Reversing starters .....	A2/20 to A2/23
Star-delta starters .....	A2/24 to A2/28



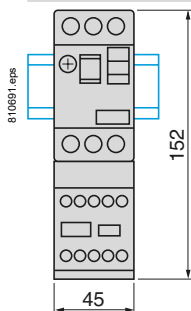
Open  
pre-cabled  
motor  
starters

#### GV2ME●●K●●●

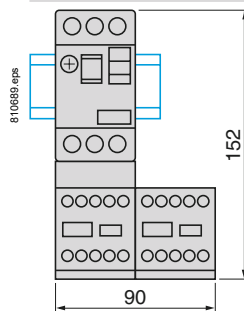
On mounting rail NSYSR200



GV2ME●●K1●●

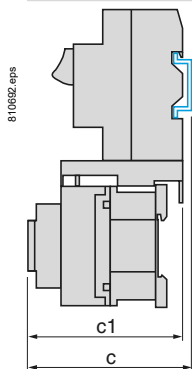


GV2ME●●K2●●

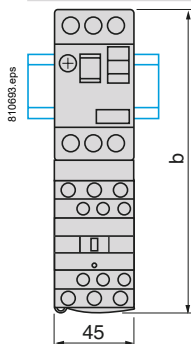


#### GV2DM●●●●●

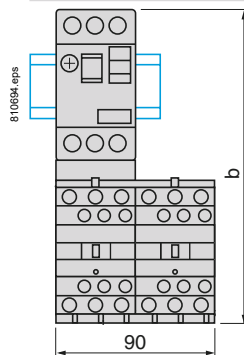
On mounting rail NSYSR200



GV2DM1●●●●



GV2DM2●●●●

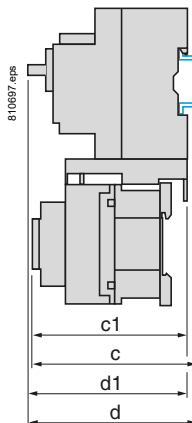


GV2DM●●●●● contactor with AC or DC coil  
on mounting rail NSYSR200

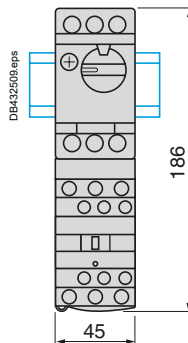
GV2	DM●02●● to DM●20●●	DM●21●● to DM●32●●
b	177	187
c	106	113
c1	96	103

#### GV2DP●●●●●

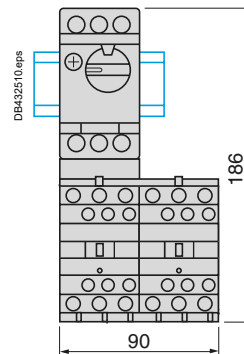
On mounting rail NSYSR200



GV2DP1●●●●



GV2DP2●●●●



GV2DP●●●●● contactor with AC or DC coil  
on mounting rail

GV2	DP●02●● to DP●08●●	DP●10●● to DP●32●●
b	178	188
c	111	118
c1	101	108
d	107	107
d1	97	97

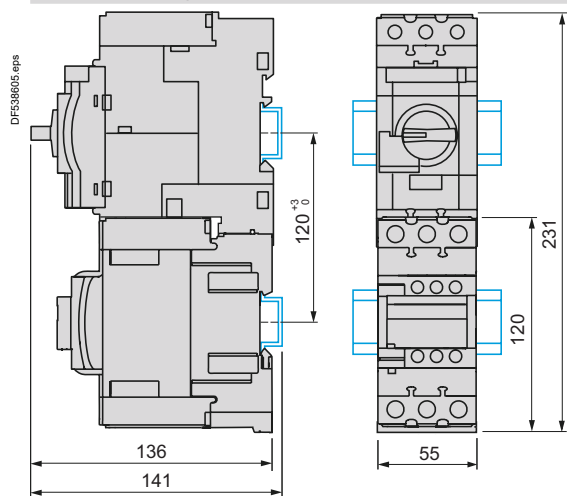
References:  
pages A2/2 to A2/7

Schemes:  
pages A2/22 and A2/23

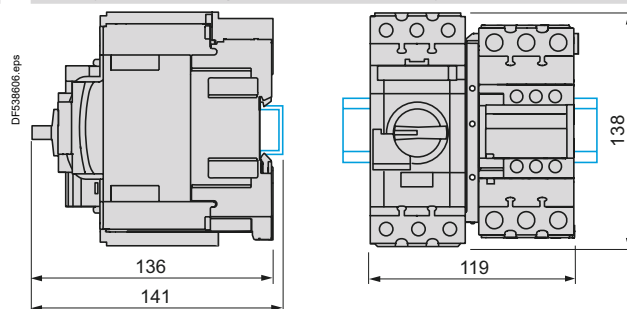


#### GV3P●●1 + LC1D40A...D65A (for customer assembly)

##### Vertical mounting <sup>(1)</sup>



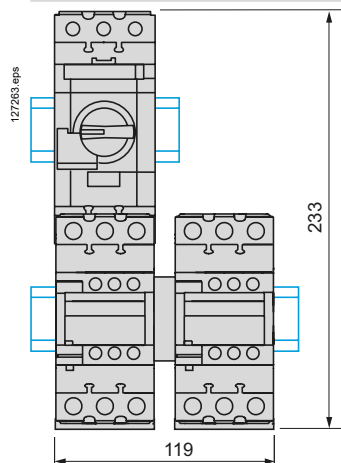
##### Side by side mounting with S-shape busbar system GV3 S <sup>(2)</sup>



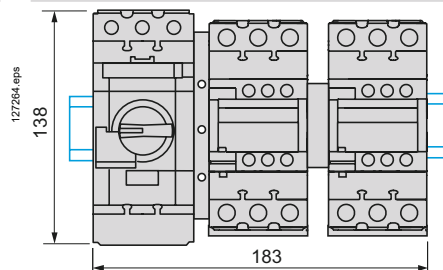
Open  
pre-cabled  
motor  
starters

#### GV3P●●1 + LC2D40A...D65A (for customer assembly)

##### Vertical mounting <sup>(1)</sup>



##### Side by side mounting with S-shape busbar system GV3 S <sup>(2)</sup>



Ref.



- <sup>(1)</sup> For several side-by-side motor starters, the maximum current allowed is equal to the nominal current under 400 V.  
Example: 55 A for a 30 kW motor under 400 V, for a GV3 P65 circuit breaker and a LC1 D65A contactor association.
- <sup>(2)</sup> The maximum current allowed is equal to 90 % of maximum current. Example: 45 A for a LC1 D50A contactor.

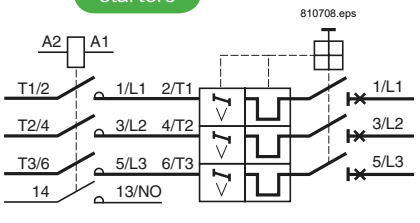


# TeSys

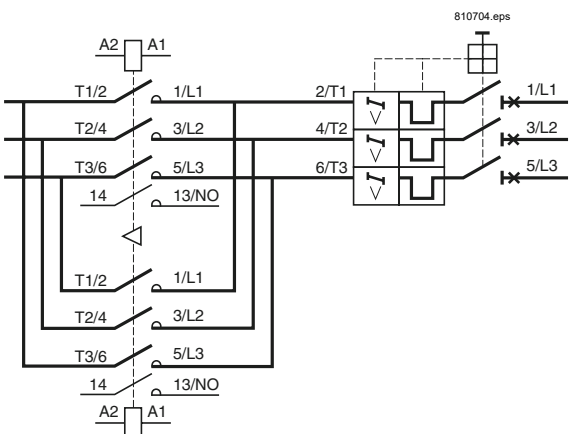
## TeSys GV2ME●●K, GV2DM Open pre-cabled motor starters

### Schemes

Open pre-cabled motor starters



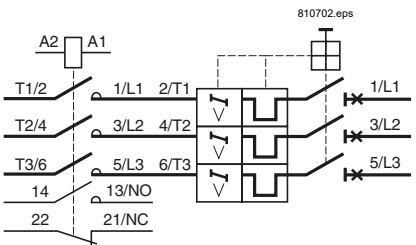
GV2ME●●K1●●



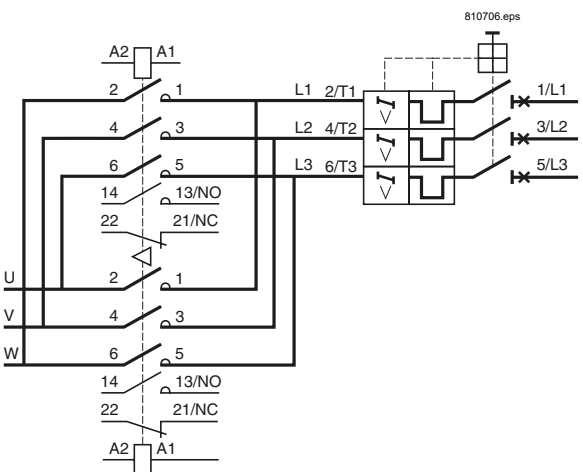
GV2ME●●K2●●

Ref.

GV2DM1●●●●



GV2DM2●●●●



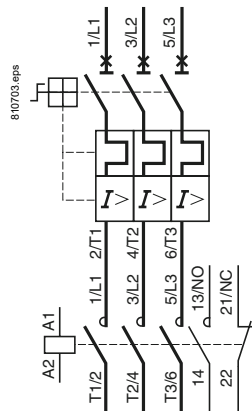


# TeSys

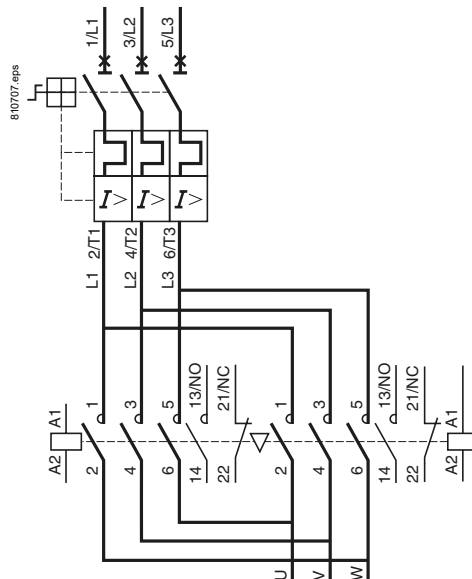
## TeSys GV2DP Open pre-cabled motor starters

### Schemes

#### GV2DP1●●●●



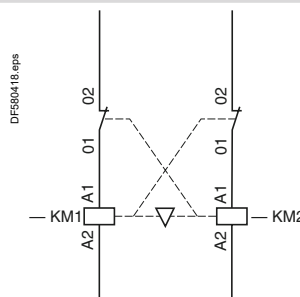
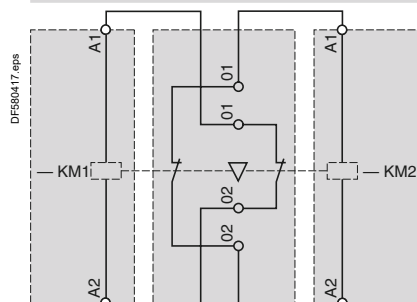
#### GV2DP2●●●●



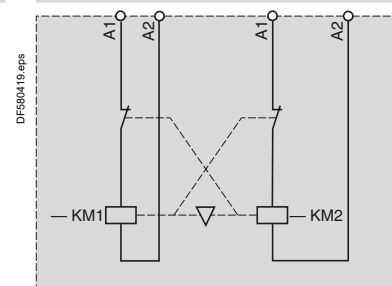
Open  
pre-cabled  
motor  
starters

#### Mechanical interlock with integral electrical contacts

Control circuit ~



Control circuit ⋯

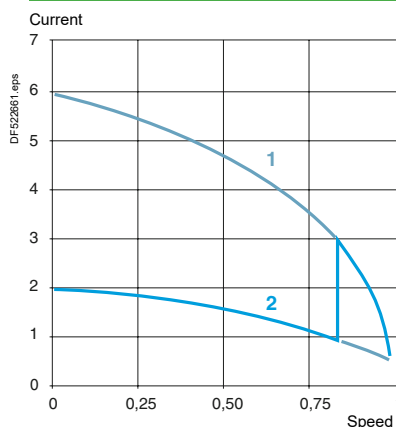


Ref.

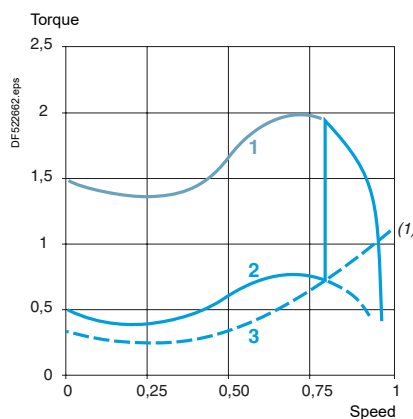




## Star-delta starting



- 1 Starting in direct delta connection
- 2 Starting in star connection



- 1 Starting in direct delta connection
- 2 Starting in star connection
- 3 Resistive torque of the machine

This method of starting is applicable to motors on which all 6 stator terminals are accessible and whose delta connection voltage corresponds to the mains voltage.

Star-delta starting should be used for motors starting on no-load or having a low load torque and gradual build-up:

- the starting torque in star connection is reduced to one third of the direct starting torque, i.e. about 50 % of the rated torque.
- the starting current in star connection is about 1.8 to 2.6 times the rated current.

The transition from star to delta connection must occur when the machine has run up to speed. A too rapid build-up in load torque would cause the stabilised run-up speed to be too low and would therefore eliminate any advantage in this method of starting: this is the case with certain machines whose load torque depends on the machine speed (a characteristic of centrifugal machines, for example).

All star-delta starters are supplied with a special LADS2 or LA2KT2 time delay relay which imposes a delay on the delta contactor during the transition period in order to allow the star contactor sufficient breaking time.

For ratings D115 and D150, this function is performed by a time delay auxiliary contact block LADT2 and a control relay.

(1) Motor manufacturers generally specify machine load torques.  
Example: maximum resistive torque on completion of star-delta start (expressed as a proportion of the rated torque).



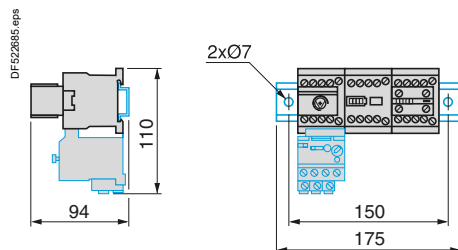
# TeSys

## TeSys LC3K, LC3D Star-delta starters

### Dimensions, mounting

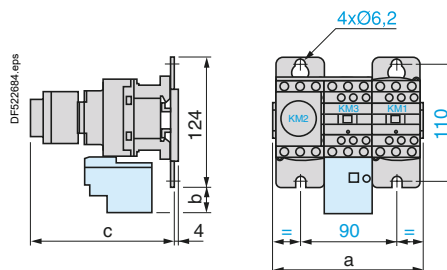
#### Dimensions

##### LC3K plate mounted, pre-assembled



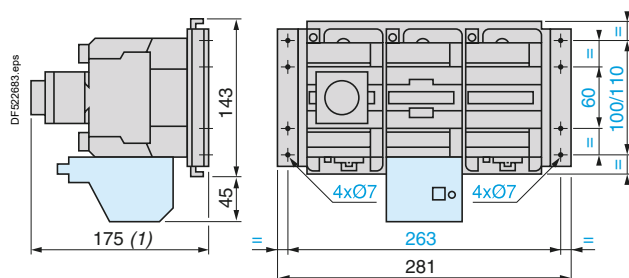
On starters LC3D09A to D18A, a connection block is mounted on the upper part of contactor KM2, increasing the overall height of the product by 6.5 mm.

##### LC3D09A...D32A pre-assembled or 3 x LC1D09A...D32A (customer assembly) + components



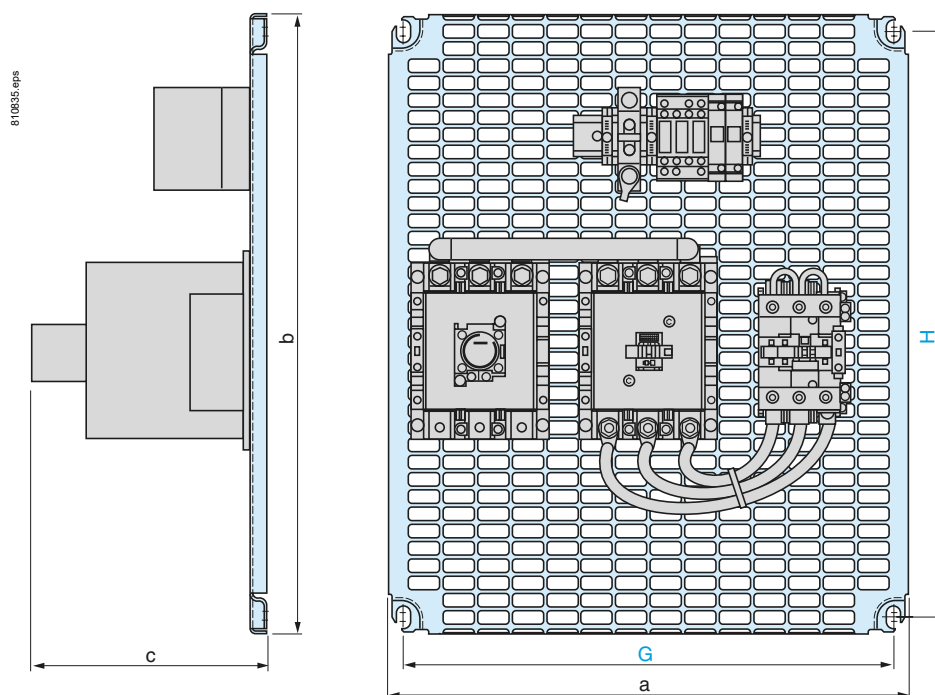
LC3	D09A	D12A	D18A	D32A
a	143	143	144	165
b	26.5	26.5	26.5	32.5
c	with LADS	139	139	145
	with LADS and sealing cover	143	143	149

##### LC3D80 pre-assembled or 3 x LC1D80 (customer assembly) + components



(1) +4 mm with sealing cover

##### LC3D115, D150 pre-assembled or 3 x LC1D115...D150 (customer assembly) + components



		a	b	c	G	H
LC3D115 or 3 x LC1D with components	D115	450	555	205	425	525
LC3D150 or 3 x LC1D with components	D150	450	555	205	425	525

References:  
pages A2/8 to A2/13

Introduction:  
page A2/24

Schemes:  
page A2/26



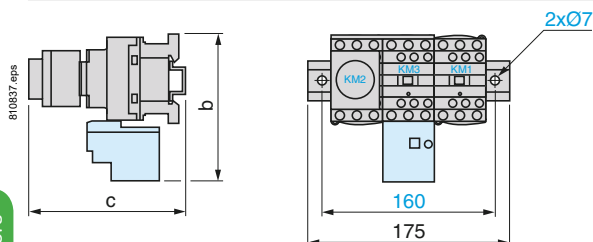
# TeSys

## TeSys LC3K, LC3D Star-delta starters

### Dimensions, mounting, schemes

#### Dimensions

LC3D090A à D320A on NSYS DR mounting rail, pre-assembled



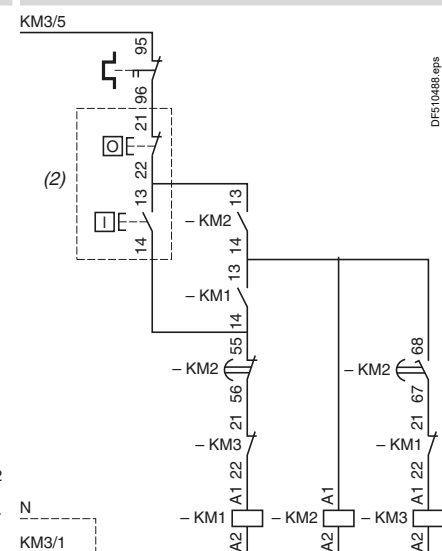
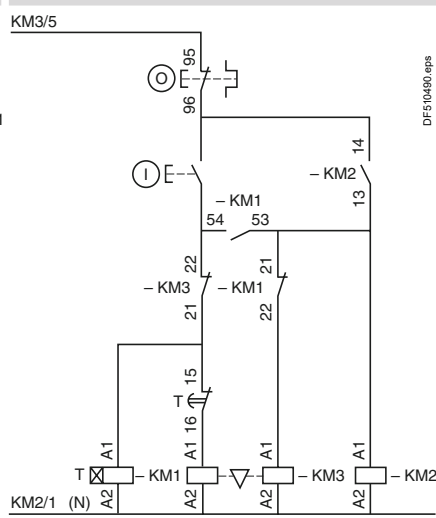
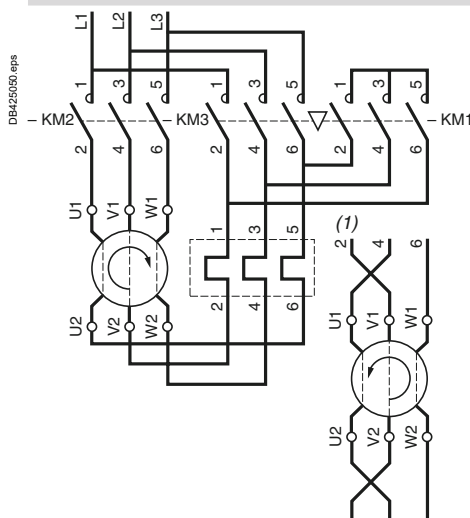
LC3	D090A à D180A	D320A
b	153	137
c	with LADS	145
	with LADS and sealing cover	149

#### Schemes

LC3K, LC3D09A to D80  
LC3D090A to D320A

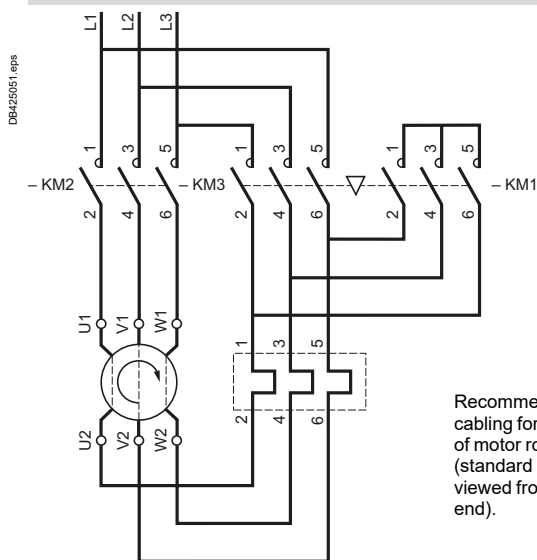
LC3K

LC3D

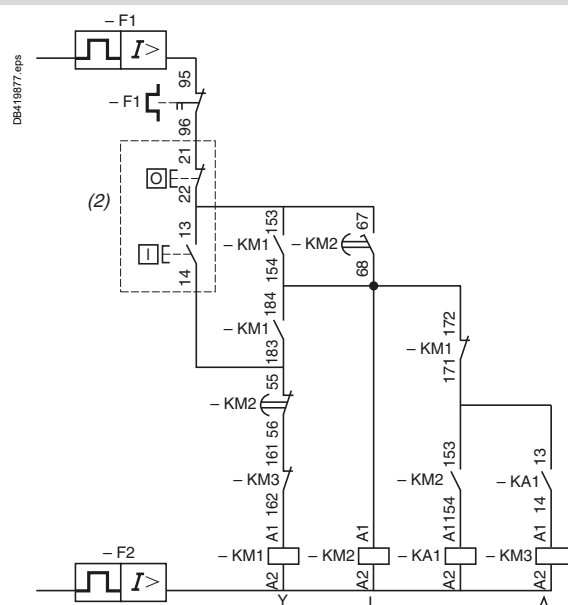
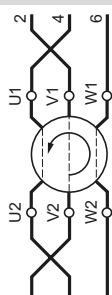


**Note:** LC3D09A to D18A: Mechanical interlock between KM3 and KM1.

LC3D115 and D150



Recommended  
cabling for reversal  
of motor rotation  
(standard motor,  
viewed from shaft  
end).



(1) Recommended cabling for reversal of motor rotation (standard motor, viewed from shaft end).

(2) Remote control.



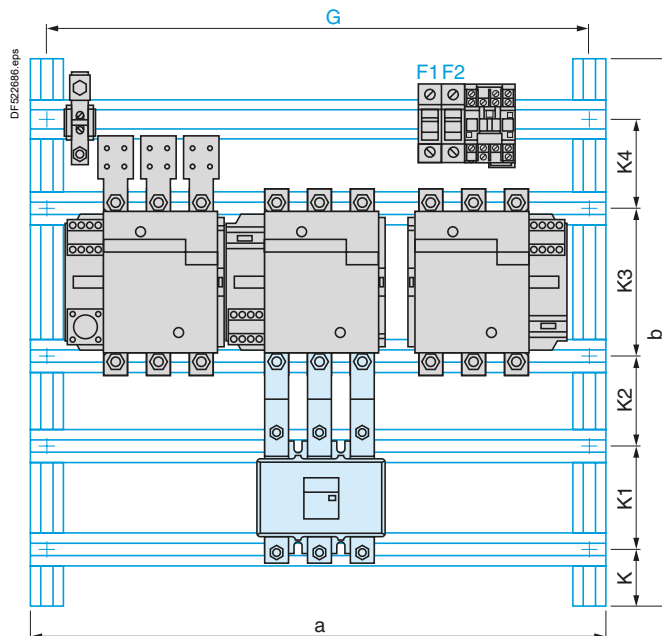
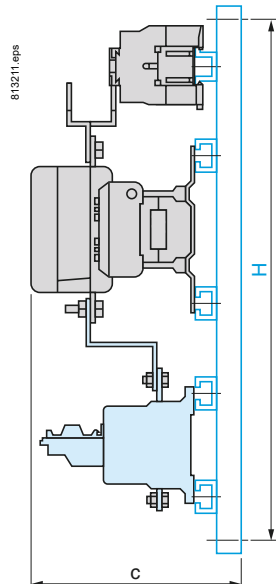
# TeSys

## TeSys LC3F Star-delta starters

### Dimensions, mounting

#### Dimensions

LC3F185 to LC3F400 - pre-assembled - chassis mounted or 2 x LC1F●●● and 1 x LC1D150 or 3 x LC1F●●● (customer assembly)



LC3F185 or 2 x LC1F●●● + 1 x LC1D  
with components F185

LC3F225 or 3 x LC1F●●● with components F225

LC3F265 or 3 x LC1F●●● with components F265

LC3F330 or 3 x LC1F●●● with components F330

LC3F400 or 3 x LC1F●●● with components F400

a	b	c	G	H	K	K1	K2	K3	K4
565	675	235	525	625	160	110	80	110	80
565	675	235	525	625	160	110	80	110	80
665	775	266	625	725	165	110	100	110	110
765	975	276	725	825	195	140	100	110	180
765	975	276	725	925	195	140	100	180	110

Open  
pre-cabled  
motor  
starters

Ref.





# TeSys

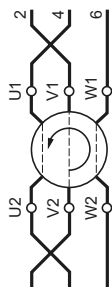
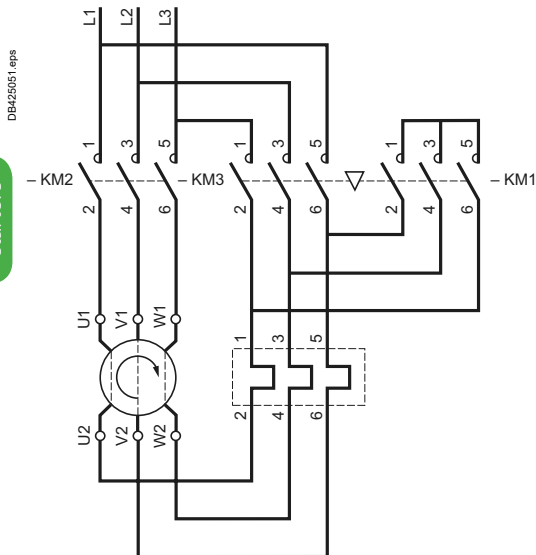
## TeSys LC3F Star-delta starters

### Schemes

#### Schemes

LC3F185 to F400

Open  
pre-cabled  
motor  
starters

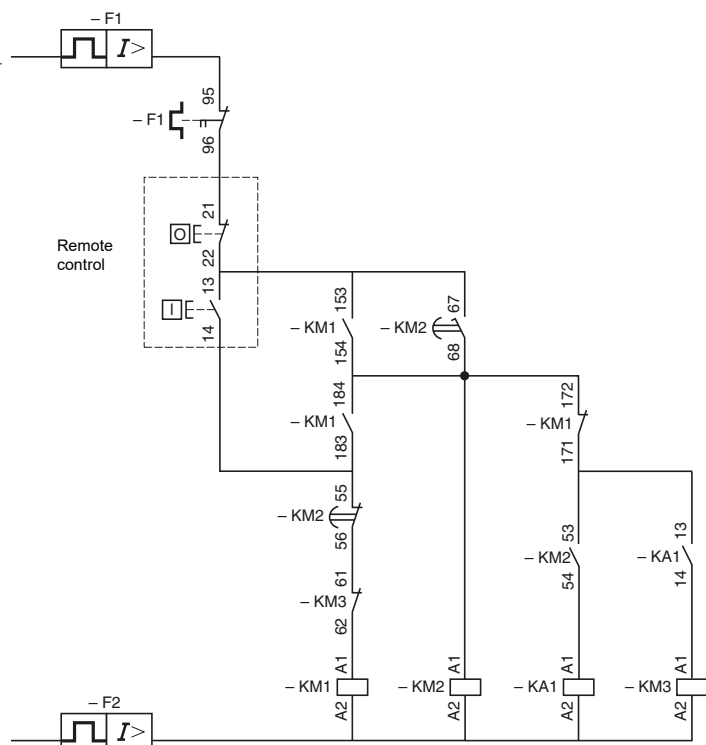


Recommended cabling for reversal of motor rotation  
(standard motor, viewed from shaft end).

Ref.

i

DB419878.eps





## Introduction

A3/2

## TeSys H Ultra-compact 22.5 mm motor starters

Type of product	Range		Page
<p>Ultra-compact starters IEC ratings</p> <p>Standard starters, screw or spring terminals, direct-on-line or reverse</p>	<p>Up to 3 kW AC53a</p> <p>Up to 9 A AC51</p>		A3/6
<p>Safety starters, screw or spring terminals, direct-on-line or reverse</p>			
<p>Ultra-compact starters UL ratings</p> <p>Standard starters, screw or spring terminals, direct-on-line or reverse</p>	<p>Up to 3 hp AC53a</p> <p>Up to 9 A AC51</p>		A3/7
<p>Safety starters, screw or spring terminals, direct-on-line or reverse</p>			
<p>Circuit breakers for a group of starters</p> <p>Selection of magnetic motor circuit breakers</p> <p>GV2L – rotary knob</p> <p>GV2LE – rocker lever</p>	<p>Up to 32 A</p>		A3/8

## Technical Data for Designers

A3/9



## The most compact 3 KW / 400 V starter in the world



### Up to 75 % of space reduction

- Ultra-compact 22.5 mm starter
- Reversing starter in the same width
- Maximum space savings for group starter architecture

### Long electrical durability

- Suitable for high demanding application
- 30 000 000 of AC53a electrical cycles

> With printed QR code, referring directly to the product data sheet.

### Easy Design

- Wide range setting motor protection
- Automatic, manual or remote reset after thermal trip
- Wide range of control voltage

### Easy to integrate

- Direct mounting installation on DIN rail
- Control terminals on the upper side
- Power terminal on the lower side



## Standard version

- 2 ratings:
  - 2.4 A 400 V AC53a
  - 6.5 A 400 V AC53a
- 2 control voltages:
  - 24 V DC
  - 110 V / 230 V AC
- 2 terminal types:
  - Screw clamps
  - Spring
- Can provide up to 3 functions:
  - Forward running
  - Reverse running
  - Overload protection



## Safety version

- Safe Torque Off embedded:
  - SIL3 according to IEC61508-1
  - Ple according to ISO13849-1
- ATEX:
  - As associated devices for motor protection

**> TeSys H is a solution dedicated to low footprint applications, in industries as food and beverage, logistics, and durable goods.**





## Conventional.....OR.....TeSys H standard solutions

TeSys H



Direct-on-line

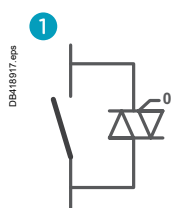


Reverse



### > How does the hybrid technology work ?

#### > Closing



**Start:** conduction through the semiconductor.

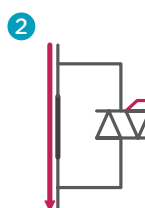
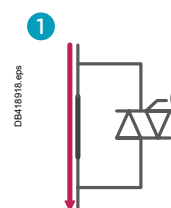


Contact closure under zero voltage. No electrical arc: the contact is preserved.



The semiconductor is non-conducting.

#### > Opening



Before the opening of the contact the semiconductor is triggered.



Contact opening: - no arc: the contact is preserved.



**Stop:** the semiconductor becomes non-conducting.

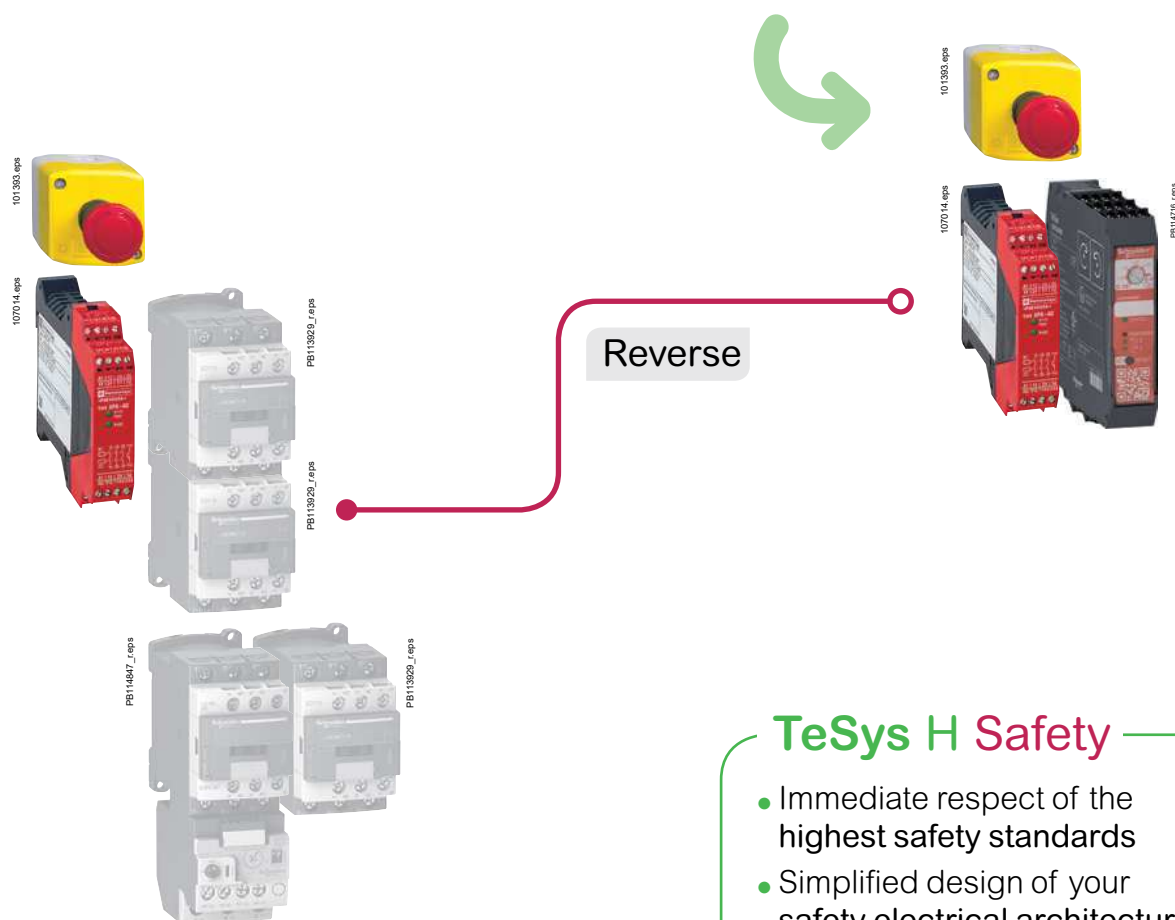
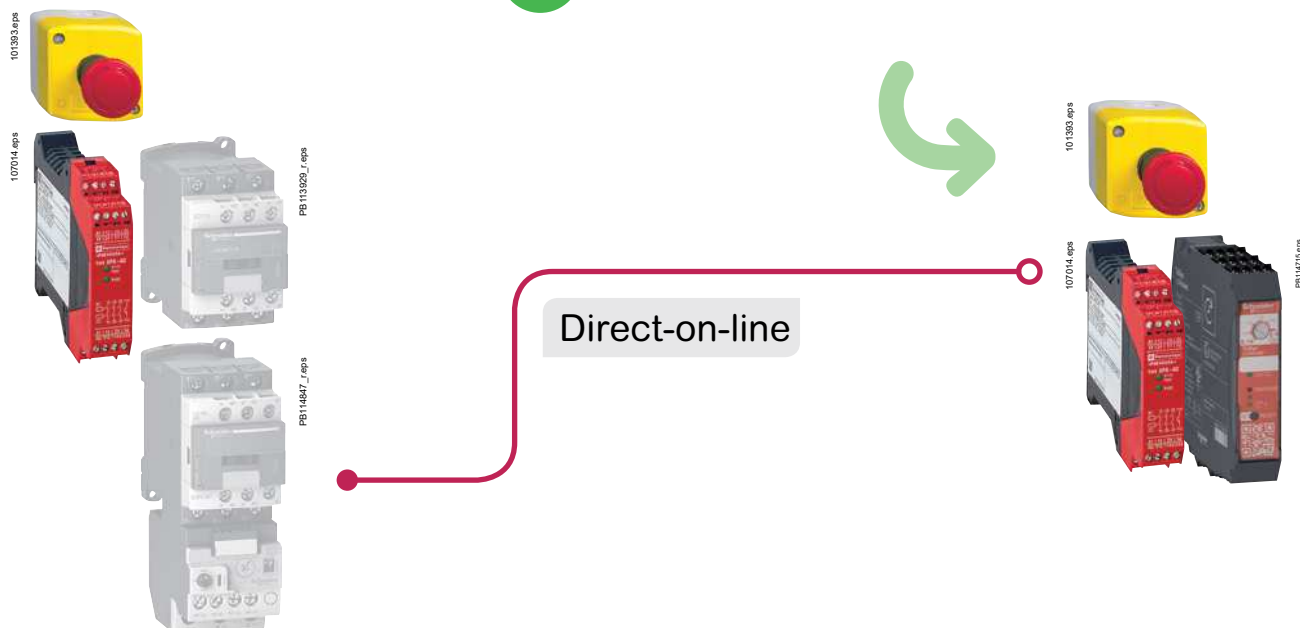
#### Hybrid technology:

Each contact is coupled with a power semiconductor for switching

> Higher number of on/off switches, extended durability.



# Conventional.....OR.....TeSys H safety solutions



## TeSys H Safety

- Immediate respect of the highest safety standards
- Simplified design of your safety electrical architecture
- Quicker panel implementation





LZ1H2X4BD

### Starters for asynchronous motors - AC53a utilization category:

#### Standard starters TeSys H per IEC ratings

Starters	3- phases motor: max power (KW) for various voltage							Current range	Commercial references <sup>(1)</sup>
	220 V	230 V	380 V	400 V	415 V	440 V	500 V		
A									
Direct-on-line									
Screw terminals	0.37	0.37	0.75	0.75	0.75	0.75	1.1	0.18...2.4	LZ1H2X4●●
	1.5	1.5	2.2	3	3	3	3	1.5...6.5	LZ1H6X5●●
Spring terminals	0.37	0.37	0.75	0.75	0.75	0.75	1.1	0.18...2.4	LZ1H2X43●●
	1.5	1.5	2.2	3	3	3	3	1.5...6.5	LZ1H6X53●●
Reverse									
Screw terminals	0.37	0.37	0.75	0.75	0.75	0.75	1.1	0.18...2.4	LZ2H2X4●●
	1.5	1.5	2.2	3	3	3	3	1.5...6.5	LZ2H6X5●●
Spring terminals	0.37	0.37	0.75	0.75	0.75	0.75	1.1	0.18...2.4	LZ2H2X43●●
	1.5	1.5	2.2	3	3	3	3	1.5...6.5	LZ2H6X53●●

(1) Replace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).



LZ7H2X4BD

#### Safety starters TeSys H per IEC ratings

Starters	3- phases motor: max power (KW) for different tensions							Current range	Commercial references <sup>(1)</sup>
	220 V	230 V	380 V	400 V	415 V	440 V	500 V		
Direct-on-line									
Screw terminals	0.37	0.37	0.75	0.75	0.75	0.75	1.1	0.18...2.4	LZ7H2X4●●
	1.5	1.5	2.2	3	3	3	3	1.5...6.5	LZ7H6X5●●
Spring terminals	0.37	0.37	0.75	0.75	0.75	0.75	1.1	0.18...2.4	LZ7H2X43●●
	1.5	1.5	2.2	3	3	3	3	1.5...6.5	LZ7H6X53●●
Reverse									
Screw terminals	0.37	0.37	0.75	0.75	0.75	0.75	1.1	0.18...2.4	LZ8H2X4●●
	1.5	1.5	2.2	3	3	3	3	1.5...6.5	LZ8H6X5●●
Spring terminals	0.37	0.37	0.75	0.75	0.75	0.75	1.1	0.18...2.4	LZ8H2X43●●
	1.5	1.5	2.2	3	3	3	3	1.5...6.5	LZ8H6X53●●

(1) Replace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).

### Starters for resistive load

#### AC51 utilization category:

Starters	Resistive load current A	Application	Commercial references <sup>(1)</sup>
Screw terminals	2.4	Standard	LZ1H2X4●●
		Safety	LZ7H2X4●●
	9	Standard	LZ1H6X5●●
		Safety	LZ7H6X5●●
Spring terminals	2.4	Standard	LZ1H2X43●●
		Safety	LZ7H2X43●●
	9	Standard	LZ1H6X53●●
		Safety	LZ7H6X53●●

(1) Replace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).





LZ1H2X43BD



LZ8H6X5BD

### Starters for asynchronous motors - AC53a utilization category:

Standard starters TeSys H per UL ratings					
Starters	3- phases motor in HP			Current range	Commercial references <sup>(1)</sup>
	208 V	220 V - 240 V	440 V - 480 V		
	A				
Direct-on-line					
Screw terminals	1/2	1/2	1	0.18...2.4	LZ1H2X4●●
	1	1.5	3	1.5...6.5	LZ1H6X5●●
Spring terminals	1/2	1/2	1	0.18...2.4	LZ1H2X43●●
	1	1.5	3	1.5...6.5	LZ1H6X53●●
Reverse					
Screw terminals	1/2	1/2	1	0.18...2.4	LZ2H2X4●●
	1	1.5	3	1.5...6.5	LZ2H6X5●●
Spring terminals	1/2	1/2	1	0.18...2.4	LZ2H2X43●●
	1	1.5	3	1.5...6.5	LZ2H6X53●●

<sup>(1)</sup> Replace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).

Safety starters TeSys H per UL ratings					
Starters	3- phases motor in HP			Current range	Commercial references <sup>(1)</sup>
	208 V	220 V - 240 V	440 V - 480 V	A	
Direct-on-line					
Screw terminals	1/2	1/2	1	0.18...2.4	LZ7H2X4●●
	1	1.5	3	1.5...6.5	LZ7H6X5●●
Spring terminals	1/2	1/2	1	0.18...2.4	LZ7H2X43●●
	1	1.5	3	1.5...6.5	LZ7H6X53●●
Reverse					
Screw terminals	1/2	1/2	1	0.18...2.4	LZ8H2X4●●
	1	1.5	3	1.5...6.5	LZ8H6X5●●
Spring terminals	1/2	1/2	1	0.18...2.4	LZ8H2X43●●
	1	1.5	3	1.5...6.5	LZ8H6X53●●

<sup>(1)</sup> Replace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).

### Starters for resistive load

#### AC51 utilization category:

Starters	Resistive load current A	Application	Commercial references <sup>(1)</sup>
Screw terminals	2.4	Standard	LZ1H2X4●●
		Safety	LZ7H2X4●●
	9	Standard	LZ1H6X5●●
		Safety	LZ7H6X5●●
Spring terminals	2.4	Standard	LZ1H2X43●●
		Safety	LZ7H2X43●●
	9	Standard	LZ1H6X53●●
		Safety	LZ7H6X53●●

<sup>(1)</sup> Replace the ●● in the reference by the bobine code: BD (24 V DC) or FU (110-230 V AC).







GV2L + LZ2H2X4BD

Magnetic motor circuit breakers:

- GV2L: rotary knob type -  $U_e = 500$  V
- GV2LE: rocker lever type -  $U_e = 415$  V.

#### Selection of the circuit breaker Type 1 coordination according to IEC/EN 60947-4-2

Max	I <sub>q</sub>	Number of TeSys H		Reference Circuit breaker	
		2.4 A	6.5 A	Rotary	Rocker
A	kA				
0.4	50.0	1	—	GV2L03	GV2LE03
0.63	50.0	1	—	GV2L04	GV2LE04
1	50.0	1	1	GV2L05	GV2LE05
1.6	50.0	1	1	GV2L06	GV2LE06
2.5	35.0	1	1	GV2L07	GV2LE07
4	12.5	1	1	GV2L08	GV2LE08
6.3	8.0	2	1	GV2L10	GV2LE10
10	7.0	4	1	GV2L14	GV2LE14
14	5.0	5	2	GV2L16	GV2LE16
18	4.0	7	2	GV2L20	GV2LE20
25	4.0	10	3	GV2L22	GV2LE22
32	3.0	13	4	GV2L32	GV2LE32



# Technical Data for Designers

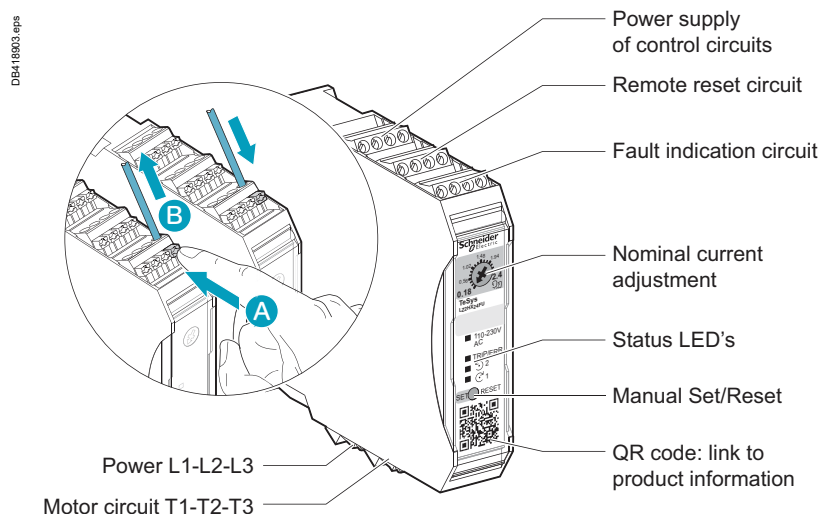
## Contents

Description .....	A3/10 to A3/11
Characteristics .....	A3/12 to A3/13
Curves .....	A3/14 to A3/15
Dimensions and schemes .....	A3/16



#### Identification of terminals / Indicators / Setting means and procedure

##### Setting procedure



STEP	ACTION
1	Lift the cover on the front of the TeSys H motor starter to access the SET/RESET button.
2	Press and hold down the SET/RESET button for at least 6 seconds. After 6 seconds the 110-230 V AC or 24 V DC LED flashes once.
3	After the LED has flashed once, release the SET/RESET button.
4	Turn the potentiometer to select a nominal current, and then fine-tune the position until the LEDs indicate the exact nominal current.
5	Press the SET/RESET button to save the selected nominal current. The 110-230 V AC or 24 V DC LED comes on and the other LEDs go off.
6	Drop the cover back over the front of the TeSys H motor starter.

#### Protection functions

##### The protection of three - phase motors is ensured against potential faults

- Thermal overload: the motor currents exceed the set value.
- Phase unbalanced: the motor currents differ from each other by more than 33 %
- Phase loss: power missing on one or several phases
- Stall and jam: motor current exceeding 45 A for more that 2 s during starting or running phase - No motor is connected - Motor current is lower that the minimum configurable current for more than 2 seconds, on at least two phases.

For all this detected situations, the TeSys H motor starter will switch off, activate its TRP/ERR LED and fault signaling contact.

Please refer to the "Instruction sheet and User Guide" for more information.

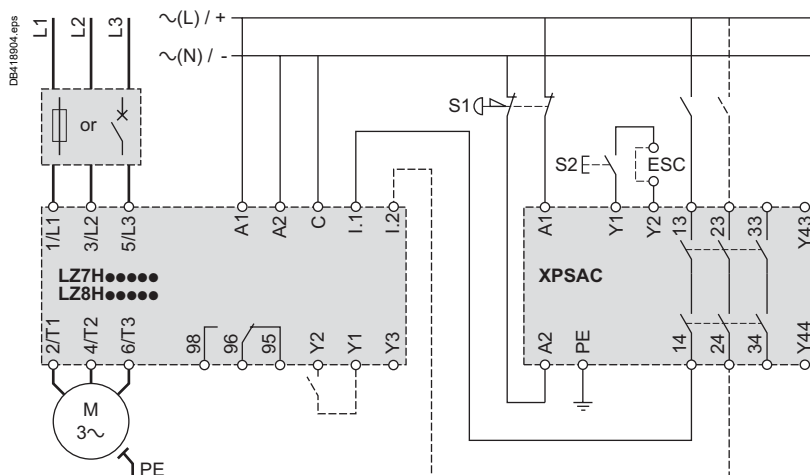


### Electrical diagrams for Safety chain applications

#### Preferred

Electrical life time: 30000000 AC53a electrical cycles

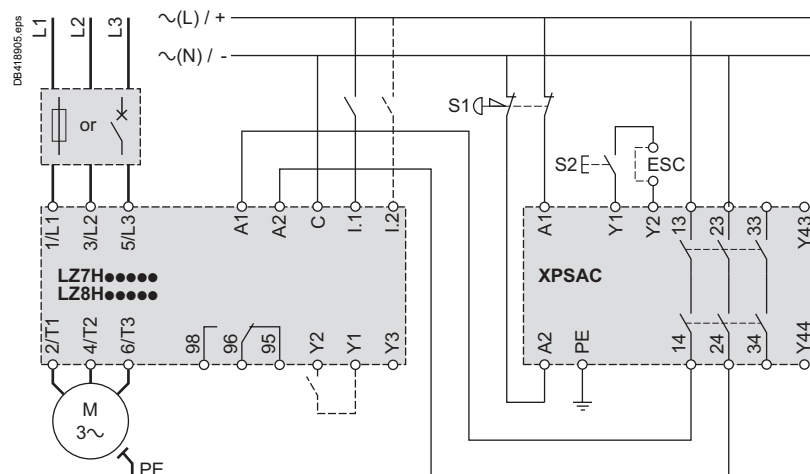
Safety Chain Application for Monitoring Emergency STOP Circuits with Two Channel Inputs and Two Channel Outputs with Preventa XPSAF Safety Processing Device.



#### Possible but non- recommended

Electrical life time: 10000 AC53 a electrical cycles

Safety Chain Application for Monitoring Emergency Stop Circuits with Two Channel Inputs and Two Channel Outputs with Preventa XPSAC Safety Processing Device.





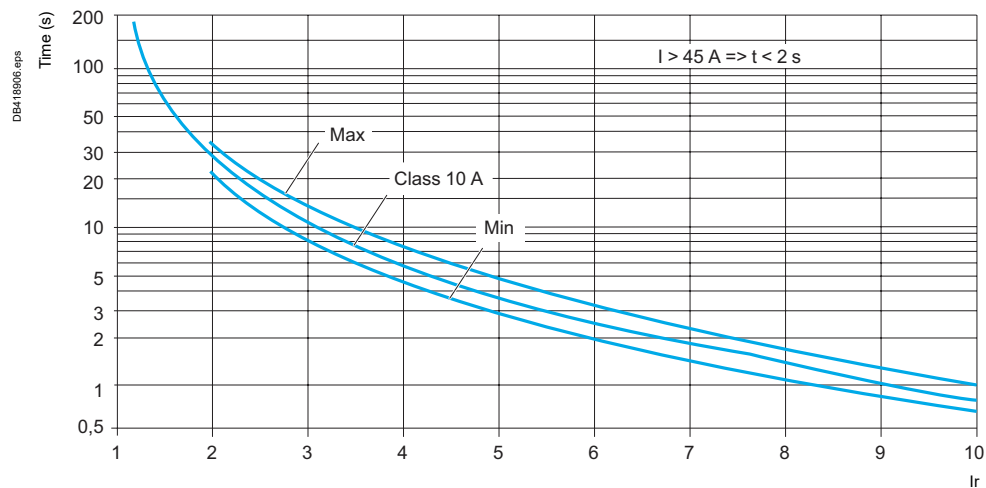
Environment				
Rated insulation voltage (Ui)	Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution: 2	V	500	
Rated impulse withstand voltage (Uimp)	Conforming to IEC/EN 60947-4-2	kV	6 (24 V DC control voltage); 4 (110 V - 230 V AC control voltage)	
Conforming to standards			IEC / EN 60947-4-2	
Product certifications			CE, CUL, ATEX ( for failsafe product), CCC	
Degree of protection	Conforming to IEC / EN 60947-1		IP20	
Environment category	Conforming to IEC / EN 60947-1		E	
Climatic withstand			Conforming to IEC/EN 60068-2-30	
Ambient air temperature around the device	Storage	°C	-40...+80	
	Operation (see derating curves)	°C	-25...+70	
Maximum operating altitude	without derating	m	2000	
	with derating	m	No	
Operating positions (see derating curves)	Vertical axis (horizontal DIN rail)		Yes	
	Horizontal axis (vertical DIN rail)		Not authorised	
Shock resistance	Conforming to IEC/EN 60068-2-27	gn	30 Starter OFF	
1/2 sine wave = 18 ms		gn	30 Starter ON	
Vibration resistance	Conforming to IEC/EN 60068-2-6	gn	5 Starter OFF	
10...150 Hz		gn	5 Starter ON	
Resistance to electrostatic discharge	Conforming to IEC/EN 61000-4-2	kV	Air discharge: 8 kV	
		kV	Contact discharge: 6 kV	
Immunity to radiated high-frequency disturbance	Conforming to IEC/EN 61000-4-3			
	80 - 1 GHz	V/m	20	
	1.0 - 6 GHz	V/m	10	
Immunity to fast transient currents	Conforming to IEC/EN 61000-4-4	kV	3	
Immunity to conducted high frequency disturbances	Conforming to IEC/EN 61000-4-6	V	10	
Radiated emission and conducted	Conforming to CISPR 11 and EN 55011		Class A	
Surge	Conforming to IEC/EN 61000-4-5	kV	1 symmetrical	
		kV	2 asymmetrical	
Control circuit characteristics				
Rated voltage	~ 50/60 Hz	V	110 - 230	
	---	V	24	
Voltage limits	~ 50/60 Hz	V	85...253	
	---	V	19.2...30	
Voltage dips		ms	3	
Short time interruptions		ms	3	
Power circuit characteristics				
			LZ●2X4●●	LZ●6X5●●
Power dissipation for corresponding Rated Operating Current (see derating curve)		W	0.88 ... 4.1	0.88 ... 7
Rated Operating Current	AC51 conforming to IEC/EN 60947-4-3	A	0.18 - 2.4	1.5 - 9
	AC53a conforming to IEC/EN 60947-4-2	A	0.18 - 2.4	1.5 - 6.5
Electrical life	AC51	Op	30 000 000 <sup>(1)</sup>	
		Op	10 000 <sup>(2)</sup>	
	AC53A	Op	30 000 000 <sup>(1)</sup>	
		Op	10 000 <sup>(2)</sup>	
Maximum Operating rate	AC51	Op/h	7200	
	AC53A		See curves	
Time to restart after overload trip	Manual or remote mode	mn	2	
	Automatic	mn	20	
Power and control terminal Characteristics				
	Terminal type		Screw M3	Push in
Flexible cable without cable end	1 conductor	mm²	0.25...2.5	0.25...2.5
	2 conductors	mm²	0.25...0.75	
Flexible cable with cable end	1 conductor	mm²	0.25...2.5	0.25...2.5
	2 conductors	mm²	0.25...1.5	0.25...1.5
Solid cable without cable end	1 conductor	mm²	0.25...2.5	0.25...2.5
	2 conductors	mm²	0.25...0.75	
Screwdriver		mm	flat screwdriver: 3 mm	
Tightening torque		N.m	0.5..0.6	
(1) With ON/OFF control through control inputs (I <sub>1</sub> , I <sub>2</sub> terminals) (2) With ON/OFF control through power supply (A <sub>1</sub> , A <sub>2</sub> terminals).				
References: pages A3/6 and A3/7	Description: pages A3/10 and A3/11	Curves: pages A3/14 and A3/15	Dimensions, schemes: page A3/16	



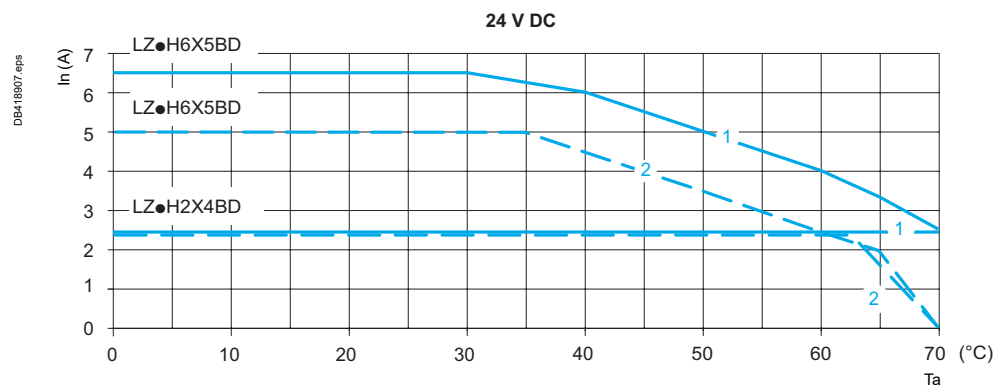
System conditons			
Database for failure rates		SN 29500	
System type		Type B	
Standard used		IEC 61508	
Beta factor		1 %	
Mean time to failure (MTTF) at an ambient temperature 40 °C		39.3 (LZ7H or LZ8H 24 V DC) 39.1 (LZ7H or LZ8H 110/230 V AC)	
Safe torque-off			
		LZ7H or LZ8H 24 V DC	LZ7H or LZ8H 110/230 V AC
Ambient temperature	°C	40	40
Mean time to failure (MTTF)		517	289
Switch-off time		80	100
λsd [FIT] safe, detectable		664	638
λsu [FIT] safe, undetectable		968	935
λdd [FIT] dangerous, detectable		218	388
λdu [FIT] dangerous, undetectable		2.67	6.82
SFF [%] Safe failure fraction		99	99
DCS [%] Diagnostic coverage safe		40.7	40.6
DC [%] Diagnosctic coverage		98	98
PFH Probability of dangerous failure per hour		2.67 x 10 <sup>-9</sup>	6.82 x 10 <sup>-9</sup>
Safety level		IEC/CEI 61508-1: SIL 3 ISO 13849-1: Category 3 PL e EN 60954-1: Category 3	
Motor overload protection			
		LZ7H or LZ8H 24 V DC	LZ7H or LZ8H 110/230 V AC
Ambient temperature	°C	40	40
Mean time to failure (MTTF)		447	273
Time to trip		As for Class 10 A, IEC/CEI 60947-4-2	
λsd [FIT] safe, detectable		637	636
λsu [FIT] safe, undetectable		870	841
λdd [FIT] dangerous, detectable		239	402
λdu [FIT] dangerous, undetectable		17	17
SFF [%] Safe failure fraction		99	99
DCS [%] Diagnostic coverage safe		42.3	43.1
DC [%] Diagnosctic coverage		93	95
Safetv level		IEC/CEI 61508-1: SIL 2	



## Overload protection tripping curve at 20 °C

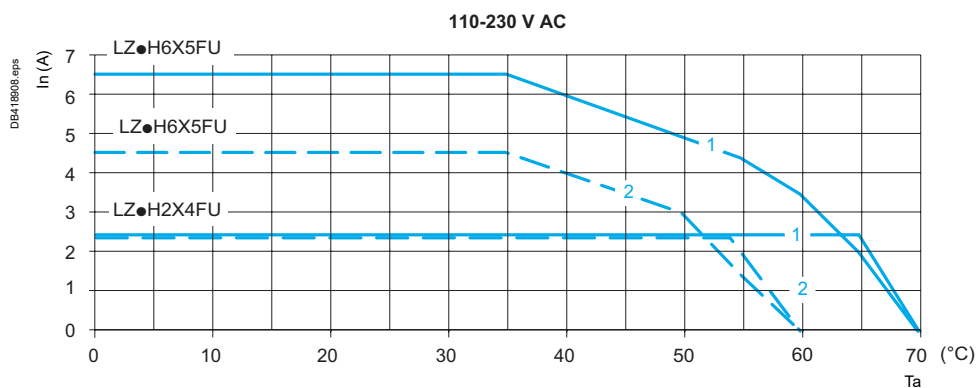


## Derating curves: maximum load current ( $I_n$ )



### Derating according:

- motor starter control power supply
- ambient temperature ( $T_a$ )
- distance between devices 1: 20 mm, with spacing  
2: without spacing.

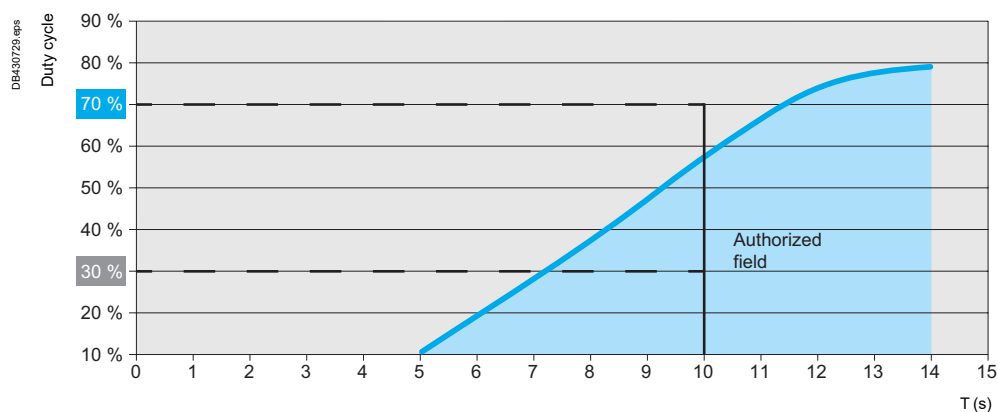




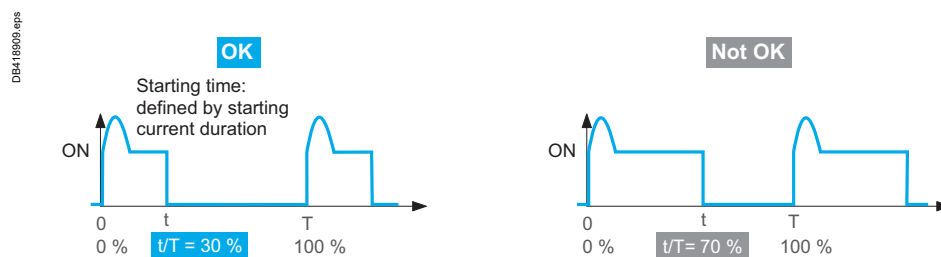
#### Minimum duty cycle $t/T$ (%) versus cycle duration $T$ (s)

Due to the effect of the peak current on the TeSys H monitoring circuit during the starting time, a stop/start sequence should not occur before a certain amount of time. The diagrams below show the minimum duty cycle according to the total period for 2 typical starting time values.

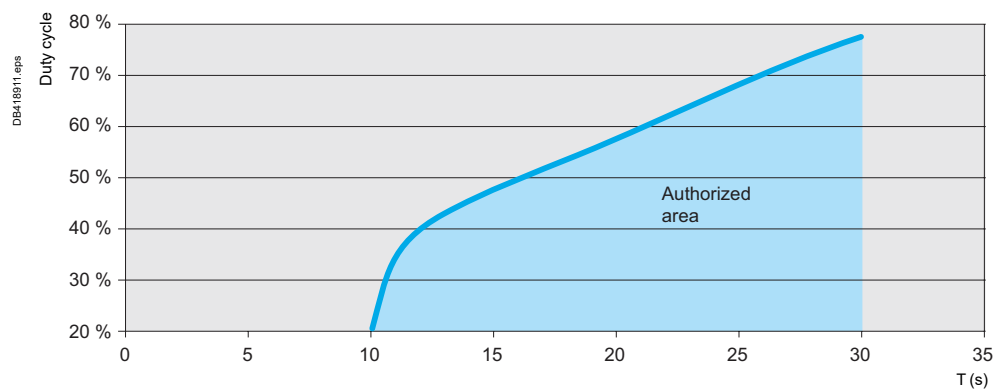
##### With a starting time = 100 ms



##### Example for starting time of 100 ms with period $T = 10$ s.



##### With a starting time = 150 ms





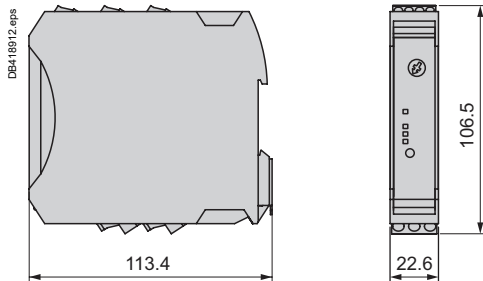
# TeSys

## TeSys H Ultra-compact starters

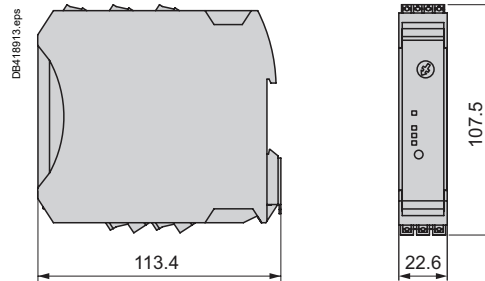
### Dimensions, schemes

#### Dimensions mm

LZ●H●●●●●

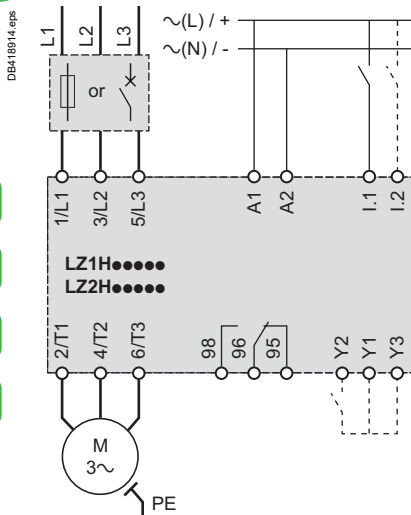


LZ●H●●●●3●●

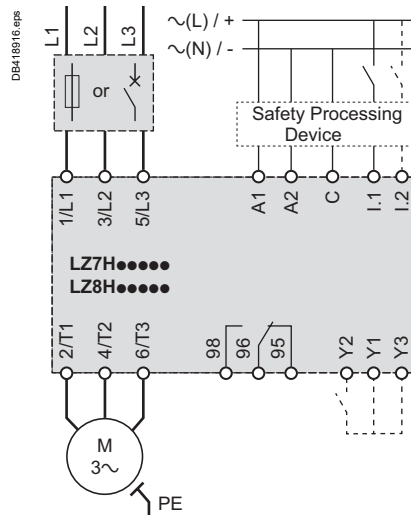


#### Wiring diagrams

##### Motor control by standard starter



##### Motor control by safety starter



#### Power terminals

T1, T2, T3 Motor connection  
L1, L2, L3 Power inputs

#### Control terminals


A1, A2 Auxiliary power unit  
I.1 Control input, direction 1  
I.2 Control input, direction 2  
(LZ2H and LZ8H only)  
C Control inputs common point  
(LZ7H and LZ8H only)  
Y1 Reset mode, common point  
Y2 Reset mode, remote, manual  
Y3 Reset mode, automatic  
98, 96, 95 Trip or error signaling contact



### Introduction

A4/2

### TeSys U - Power bases, control modules, connectors


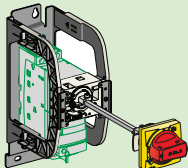
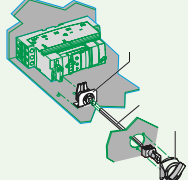

Type of product	Range		Page
Standard power base, basic control functionalities Direct and reversing	Up to 18.5 kW		A4/10

### TeSys U - Communication components

Parallel type cabling system Principle and components		A4/16
Bus type cabling systems Principle, panorama and components		A4/21
LUFP communication gateway		A4/30

TeSys U

### TeSys U - Accessories

Short circuit current limiter		A4/31
Handles and accessories for rotary control		A4/32
Handles and accessories for integration into a MCC drawer		A4/33
TeSys U with Altistart U01 Soft starters and Variable speed controllers		A4/34

### Technical Data for Designers

A4/41



## From traditional solution to ...

Motor circuit  
breaker:  
**TeSys GV2L**



Magnetic protection  
 > short-circuit protection

Contactor:  
**TeSys D**

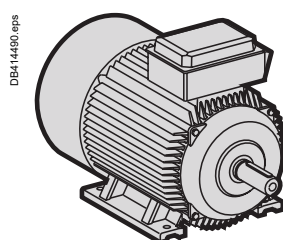


Control  
 > Start /Stop  
 Status monitoring  
 > signaling  
 > alarm monitoring

Protection  
relay:  
**TeSys LRD**



Thermal protection  
 > overload





## ...TeSys U starter-controller



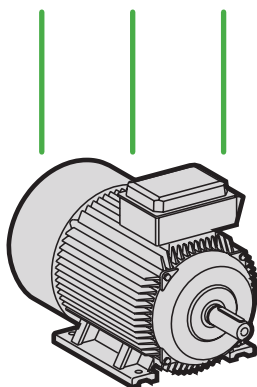
DB432795.eps

TeSys U

### TeSys U starter-controller

> All basic or advanced protection and control functions in one block and more...

- > Overload indication and alarm
- > Status report, remote control via communication bus



DB41480.eps

✓ **TeSys U**  
can be used in  
**80 %**  
of motor protection  
and control  
applications.





## 1 All in one

- Optimising space in enclosures.
- Total coordination (No contact welding on short circuit).
- Reduces installation times.

## 2 Simplicity of choice

- Controlled power.
- Protection functions ensured.
- Signaling functions, communication with PLC ensured.

## 3 Universal mounting

- On DIN rail or grid.

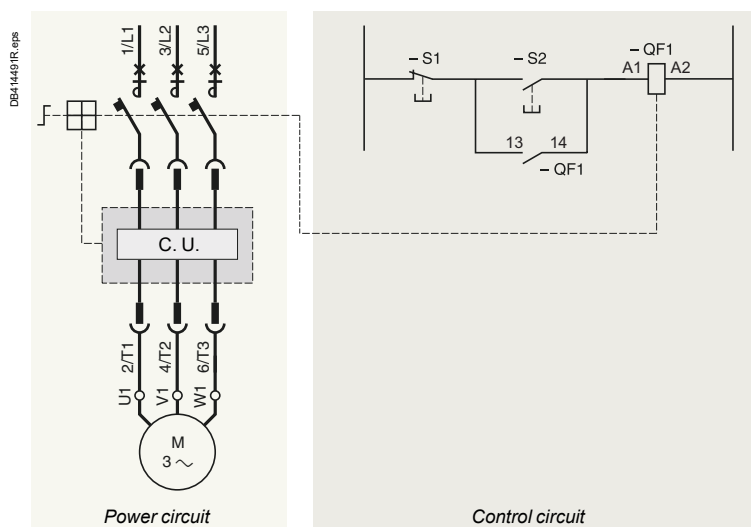
## 4 Conventional projet design

- Conventional control scheme with start , stop push buttons.

## 5 Electrically simple

Basic scheme of a TeSys U starter-controller

- Protection and power control functions acting on a single set of contact (QF1).
- The control unit (CU) monitors the voltage and current. In case of fault, it releases the coil, causing tripping.
- The coil is controlled by manual orders from an operator. Automatic control from a PLC is achieved with other diagrams.





# TeSys

## TeSys U All-in-one motor starters

### Introduction



#### Motor up to

- 7.5 kW / 1-phase 230 V / 50-60 Hz.
- 18.5 kW / 3-phase 400-440 V / 50-60 Hz.
- 18.5 kW / 3-phase 500 V / 50-60 Hz.
- 22 kW / 3-phase 690 V / 50-60 Hz.
- Non-reversing or reversing.

## Common characteristics

### Short-circuit protection

- I<sub>sc</sub>:
  - 50 kA at ≤ 400 V
  - 10 kA at 500 V
  - 4 kA at 690 V.
- Up to 690 V AC.

### Overload protection

- From 0.15 to 38 A, 6 setting ranges (tripping 14.2 x I setting).
- Test button.
- Adjustment lock.
- Coil choice: 24 V, 48...72 V, 110...240 V DC/AC.

### 3 power contacts

- For non-reversing (reversing with reverser block).
- I<sub>max</sub>, for 12 A power base (direct - reversing):
  - 12 A at up to 500 V / 50 Hz
  - 9 A > 500 V, up to 690 V.
- I<sub>max</sub>, for 38 A power base (direct - reversing):
  - 38 A at up to 500 V / 50 Hz
  - 21 A > 500 V, up to 690 V.

### 1 NO contact

### 1 NC contact

- 5 A / max. 690 V AC or 250 V CC.

### Other monitoring contacts

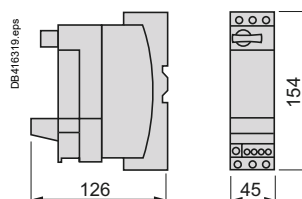
- 5 A / max. 690 V AC or 250 V DC.

### Communication modules

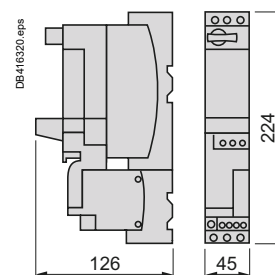
- Modbus,
- Ethernet,
- CANopen,
- DeviceNet,
- Advantys stb,
- Profibus DP,
- AS-interface.

### Dimensions

#### ■ Base:



#### ■ Base + reverser block:





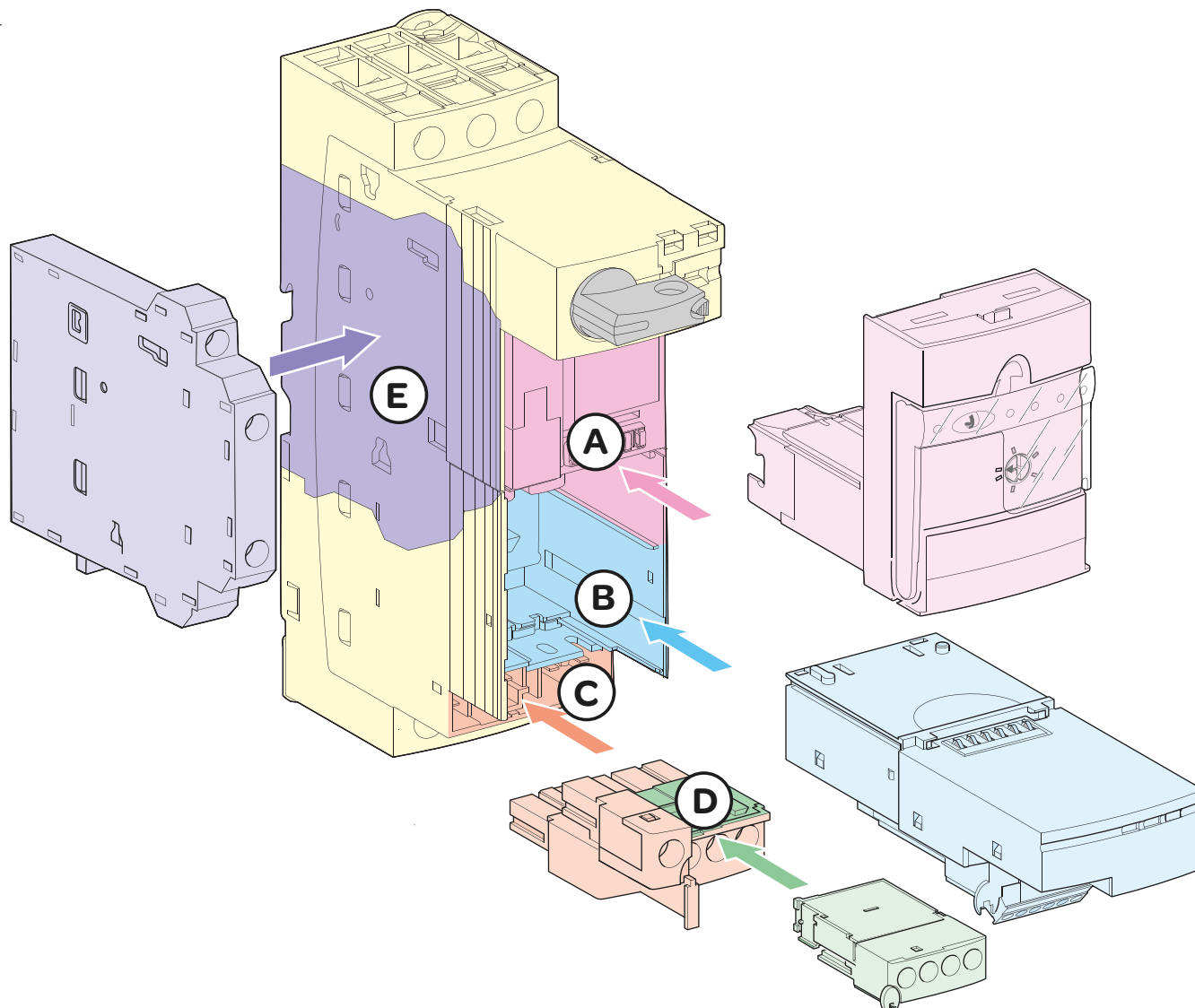
# TeSys

## TeSys U All-in-one motor starters

### Introduction

DB 414483 eps

TeSys U



## The modularity principle

- Power base
- (A) Cavity for control unit
- (B) Cavity for auxiliary module
- (C) Cavity for control terminal block
- (D) Cavity for additional contact block or shutter
- (E) Space for additional block fastening

### Power Base

This is the basic constituent of the motor starter, it is composed of the power contacts, the control coil, the opening / closing mechanism of the protection device and the control pad.

### Additional lateral block

Composed of the protection device signaling contacts.

### Control unit

Composed of the power base management processor and setting knobs.

### Auxiliary module

Depending on its type, it integrates load status contacts or a communication processor or an alarm processor.

### Control terminal block

It is composed of two terminals "coil control", 1 NO auxiliary contact, 1 NC auxiliary contact. It can be eventually connected to an auxiliary communication module via a dedicated cable.

### Additional block

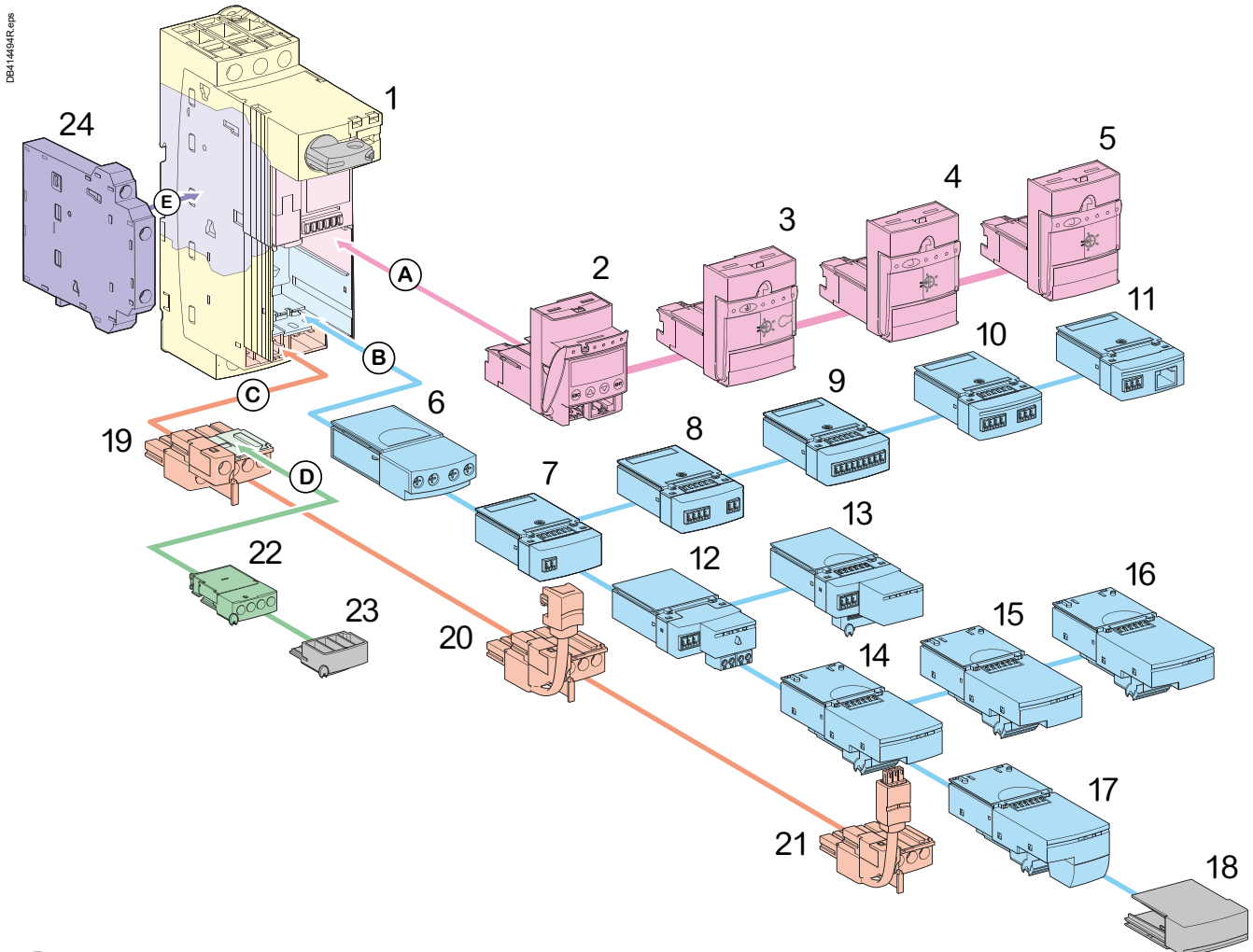
It includes protection device additional signaling contacts. By default, this is a simple shutter.



# TeSys

## TeSys U All-in-one motor starters

### Introduction



## Components overview

### Power base

- 1- LUB  
Non reversing power base -  
1 rotation direction

### Control units

- 2- LUCM  
Multifunctional control unit
- 3- LUCB/LUCC/LUCD  
Advanced control units
- 4- LUCA  
Standard control unit
- 5- LUCL  
Magnetic protection  
control unit

### Auxiliary module

- 6- LUFN  
Auxiliary contacts module

### Load monitoring auxiliary modules

- 7- LUFW10  
Overload alarm module
- 8- LUFDH11  
Overload alarm module with  
manual reset
- 9- LUFDA01/LUFAD10  
Overload alarm module with  
automatic reset/remote reset
- 10- LUFV2  
Motor load indication  
module

### Communication auxiliary modules

- 11- LUFC00  
Telefast parallel liaison  
module, with RJ45 connector
- 12- ASILUFC5/ASILUFC51  
AS-Interface c. m.
- 13- LULC033  
Modbus c. m
- 14- LULC07 Profibus DP c. m
- 15- LULC08 CANopen c. m.
- 16- LULC09 DeviceNET c. m.
- 17- LULC15 Advantys STB c. m.

### Shutters

- 18- LU9C1  
Shutter for module cavity
- 23- Shutter for contacts  
additional block cavity

### Control terminal blocks

- 19- LU9BN11  
Terminal block for imbedded  
auxiliary contacts
- 20- LU9BN11C  
Coil terminal block with its  
connecting cable
- 21- LU9BN11L  
Coil terminal block with its  
connecting cable

### Additional contacts blocks

- 22- LUA1  
Additional contacts
- 24- LUA8  
side-mounting additional  
contacts



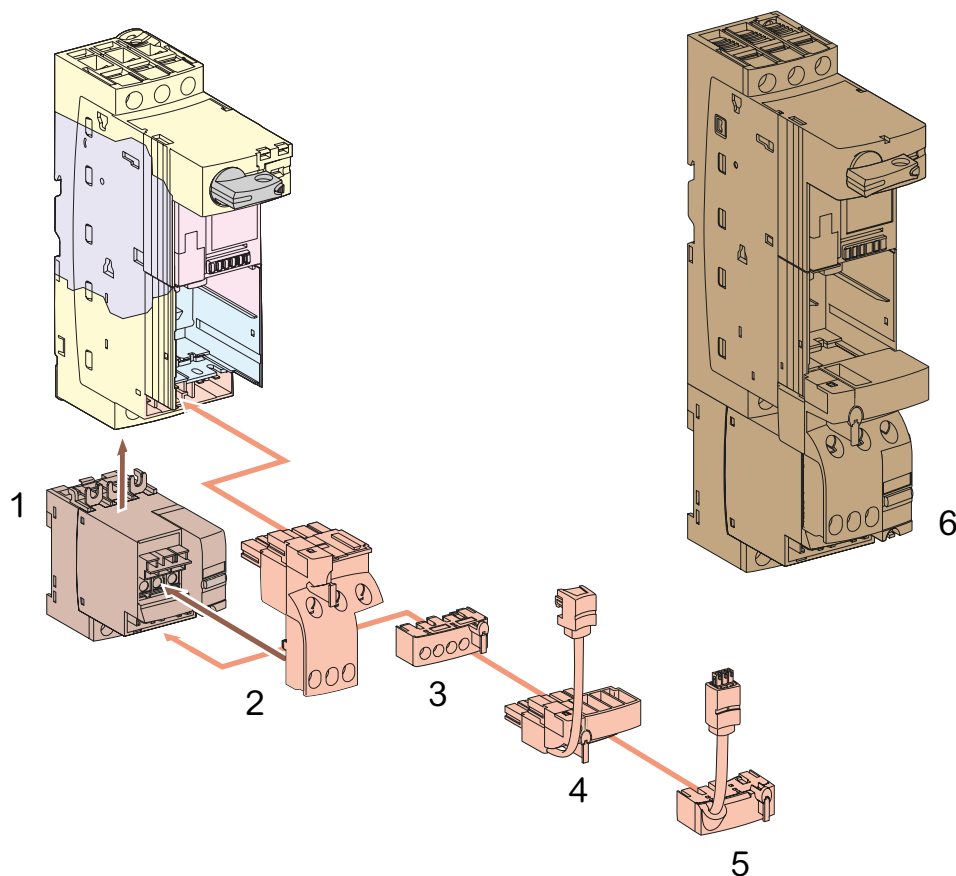
# TeSys

## TeSys U All-in-one motor starters

### Introduction

DB114/6R.eps

TeSys U



## Additional components overview

### Reverser block

- 1- LU2MB0●●  
vertical-mounting reverser block

### Evolving reversing power base

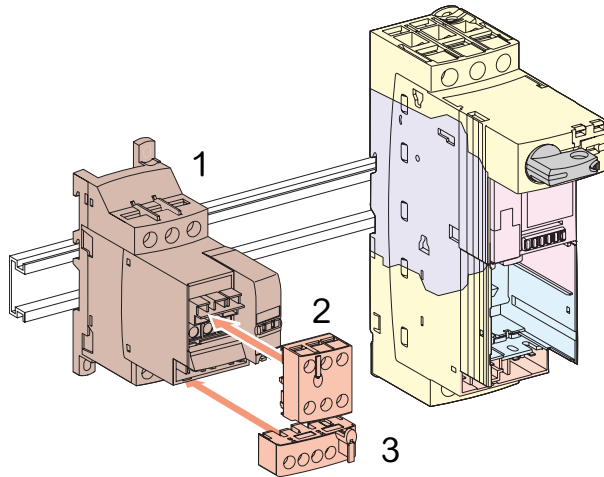
- 6- Pre-assembled reversing  
power base LU2B12

### Control terminal blocks

- 2- LU9MR1C  
Base/block assembling connector, with  
terminal block for imbedded auxiliary  
contacts
- 3- LU9M1  
Coil terminal block for wired control
- 4- LU9MRC  
Coil terminal block with its connecting  
cable for communicating control (only  
compatible with a selection of com.  
modules).
- 5- LU9MRL  
Coil terminal block with its connecting  
cable for communicating control (only  
compatible with a selection of com.  
modules).



DB414497 eps



TeSys U

## Additional components overview

### Reverser block

- 1- LU6MB0●●  
Side-mounting reverser block

### Terminal blocks for electrical remote control

- 2- LU9MR1  
Terminal block for 2 direction control (pulse or maintained control)
- 3- LU9M1  
Terminal block for power base coil interlocking.  
With direction of rotation monitoring contacts



# TeSys

## TeSys U All-in-one motor starters - Power bases

### Product references



### Power bases

TeSys U starters are composed with separate elements: power component + control units + auxiliary components.

The power base includes the electro mechanical parts. It is selected according to:

- Motor power to be handled
- Number of direction of rotation to be controlled: 1 or 2
- Type of control to be achieved: Basic or Advanced.

#### Basic control

1- direction rotation control  
2 - direction rotation control  
Overload + Short circuit protection  
Main power monitoring  
Status signaling contacts

#### Advanced control

Functions of basic control  
+ Digital display of electrical values  
+ Overload alarms  
+ Network/bus communication

Function	Max motor standard power (400 V) kW	Lip_in (400 V) A	References	
			Basic ctrl	Advanced ctrl
1-direction rotation	5.5	12	LUB12	LUB120
	15	32	LUB32	LUB320
	18.5	38	LUB38	LUB380
2-direction rotation	5.5	12	LU2B12●● <sup>(1)</sup>	LUB120 + reverser block ass.
	15	32	LU2B32●● <sup>(1)</sup>	LUB320 + reverser block ass.
	18.5	38	LU2B38●● <sup>(1) (2)</sup>	LUB380 + reverser block ass.

(1) Replace the 2 dots by the coil voltage code below – AC is 50-60 Hz.

(2) With BL or FU code only.

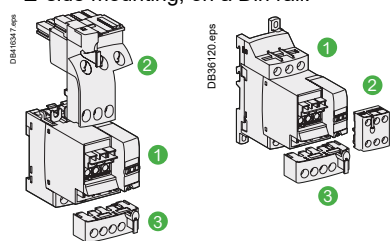
Coil voltage (V)	24---	24~	48...72 --- or ~	110...220 --- and 110...240~
Code	BL	B	ES	FU

### Reverser blocks - assemblies

A reverser block assembly has to be added to the power base (LUB120 to 380) to build an 'Advanced control' with '2-direction of rotation' TeSys U starter.

Reverser blocks with 2 mounting possibilities:

- vertical mounting– mounted aspect: refer to LU2B12, 32, 38
- side mounting, on a Din rail.



Vertical mounting Side mounting

Blocks	References	
	Vertical mounting	Side mounting
1 Reverser block	LU2MB0●● <sup>(1)</sup>	LU6MB0●● <sup>(1)</sup>
2 Aux. contacts connector	LU9MR1C	LU9MR1
3 Coil supply connector	LU9M1	LU9M1

(1) Replace the 2 dots by the coil voltage code below – AC is 50-60 Hz.

Coil voltage (V)	24---	24~	48...72 --- or ~	110...220 --- and 110...240~
Code	BL	B	ES	FU

### Main technical characteristics

#### Power bases

1-direction power base overall dimensions (HxWxD) : 154 x 45 x 126 mm  
2-direction power base (assembly with vertical mounting reverser block) overall dimensions (HxWxD): 224 x 45 x 126 mm  
Power bases are delivered with protective blanking plates.

3 power poles, for connections of a 1-phase or 3-phase motor  
Screw clamp power terminals, for up to 2 x 6 mm<sup>2</sup> conductors  
Screw clamp control terminals, for up to 2 x 1.5 mm<sup>2</sup> conductors

LUB12,32,38 imbedded terminals:

- coil supply,
- NO (13-14) contact (for control push button)
- NC (21-22) contact (for control push button).

Additional signaling contact modules provide more possibilities.

#### Reversing assemblies

LU2MB0, LU6MB0:

3 power poles, for connections of a 1-phase or 3-phase motor, screw clamp power terminals, for up to 2 x 6 mm<sup>2</sup> conductors  
LU9 connectors: screw clamp control terminals, for up to 2 x 1.5 mm<sup>2</sup> conductors

LU2MB0●●, LU6MB0●● provide terminals for power circuits.

LU9MR1C, LU9MR1 provide signalling contact terminals (82-81-84) that indicate the direction of rotation.

LU9M1 provides coil supply terminals (A2-A1-A3) and 2 NO contact terminals (A1-B1, A3-B3) for direction control.



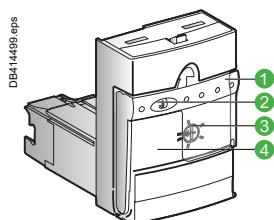
# TeSys

## TeSys U All-in-one motor starters - Control units

### Product references



LUCA, LUCB, LUCC, LUCD, LUCL series



#### LUCA.....

- ① Extraction and locking handle.
- ② Sealing of locking handle.
- ③ Ir adjustment dial.
- ④ Locking of settings by sealing the transparent cover.

TeSys U starters are composed with separate elements: power component + control units + auxiliary modules. The control unit includes electronic components and the current adjustment dial. The control unit is selected according to:

- Motor power to be handled.

Type of protection: thermal+magnetic or magnetic only.

### Control units for power bases with basic control

#### LUCA - thermal + magnetic (standard) units

- Protection against overload:  $14.2 \times I_r$  (setting current).
- Protection against short circuit:  $13 \times I_r \text{ max}$  (max setting current).
- Protection against missing or unbalanced phases.
- Protection against insulation fault (protection of equipment only).
- Class 10 tripping.
- Frequency 50...60 Hz.

#### LUCL - magnetic units

- Protection against short circuits.
- To be used when a standard power base is connected to a motor drive or a soft starter, as they provide the overload protection.

**Note:** both LUCA and LUCL units can be used in the advanced power bases LUB120 and LUB320.

Maximum standardized power ratings of 3 phases motors 50/60 Hz			Setting range	Lip_in mounting on the power base - Rating	Control unit product reference <sup>(1)</sup>	
400/440 V	500 V	690 V			Thermal + magnetic	Magnetic
kW	kW	kW	A	A	LUCA	LUCL
0.09	-	-	0.15...0.6	12 and 32	LUCAX6●●	LUCLX6●●
0.25	-	-	0.35...1.4	12 and 32	LUCA1X●●	LUCL1X●●
1.5	2.2	3	1.25...5	12 and 32	LUCA05●●	LUCL05●●
5.5	5.5	9	3...12	12 and 32	LUCA12●●	LUCL12●●
7.5	9	15	4.5...18	32	LUCA18●●	LUCL18●●
15	15	18.5	8...32	32	LUCA32●●	LUCL32●●
18.5	18.5	22	9.5...38	38	LUCA38●● <sup>(2)</sup>	LUCL38●● <sup>(2)</sup>

<sup>(1)</sup> Replace the 2 dots by the coil voltage code below – AC is 50-60 Hz.

<sup>(2)</sup> With BL or FU code only.

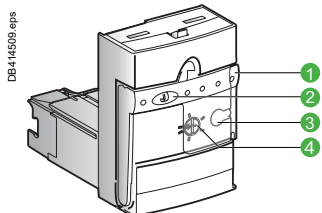
Coil voltage (V)	24---	24~	48...72 --- or ~	110...220 --- and 110...240~
Code	BL	B	ES	FU



# TeSys

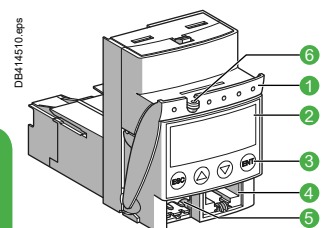
## TeSys U All-in-one motor starters - Control units

### Product references



LUCB●●●●, LUCC●●●●, LUCD●●●● control units

- 1 Extraction and locking.
- 2 Handle sealing of locking.
- 3 Handle
- 4 Ir adjustment dial test push button.



LUCM●●BL control unit

- 1 Extraction and locking handle.
- 2 Built-in LCD display (2 lines, 12 characters).
- 3 4 button keyboard.
- 4 RJ45 connector for RS485 Modbus communication
- 5 Connector for external 24 V DC power supply.
- 6 Sealing of locking handle.



LUCM12BL



XBTNU400

### Control units for power bases with advanced control

#### LUCB, LUCC, LUCD control and diagnostic units

Motor protection, fault diagnostic.

Protection against

- overload:  $14.2 \times I_r$  (setting current).
- Simulation of an overload by depressing the test push button.
- short circuit:  $13 \times I_r \text{ max}$  (max setting current).
- missing or unbalanced phases.
- insulation fault (protection of equipment only).

Overload alarm management:

- locally: with one of the LUF family module
- Remotely: with LULC031, LULC033, LULC07, LULC08, LULC09 or LULC15 (thermal alarm only) communication module.

Reset:

- manual
- automatic, with a communication module.

#### LUCM multifunctional control unit

Motor protection, operational values display and diagnostic.

To be associated with 24 V DC coil only.

LUCM●●BL: tripping class 5 to 30, single phase, three phase

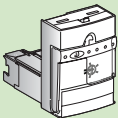
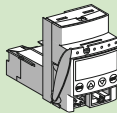
Same functions as LUCB●●●● with complementary functions:

- in working mode: display of electrical values, setting parameters and events
- in configuration mode: display of protection and alarm settings.

These functions are available for local display on a display panel, and for remote display via a RJ45 Modbus connector.

**LUCM is not compatible with LUB38.**

*Note: a 24 V DC power supply is required during the configuration process.*

Maximum standardized power ratings of 3 phases motors 50/60 Hz						Lip_in mounting on the power base - Rating	<div>DB114499 eps</div> 	Protection type: - overload - short-circuit - Main power fault - alarm	<div>DB114504 eps</div> 	Multifunctional
400/440 V	500 V	600 V	Setting range							
kW	kW	kW	A	A		Class 10	Class 10	Class 20	Class 5...30	
1P	3P	3P	3P			3P	1P	3P	1 - 3P	
-	0.09	-	-	0.15...0,6	12 and 32	LUCBX6●●	LUCCX6●●	LUCDX6●●	LUCMX6BL	
0.09	0.25	-	-	0.35...1,4	12 and 32	LUCB1X●●	LUCC1X●●	LUCD1X●●	LUCM1XBL	
0.55	1.5	2.2	3	1.25...5	12 and 32	LUCB05●●	LUCC05●●	LUCD05●●	LUCM05BL	
2.2	5.5	5.5	9	3...12	12 and 32	LUCB12●●	LUCC12●●	LUCD12●●	LUCM12BL	
4	7.5	9	15	4.5...18	32	LUCB18●●	LUCC18●●	LUCD18●●	LUCM18BL	
7.5	15	15	18.5	8...32	32	LUCB32●●	LUCC32●●	LUCD32●●	LUCM32BL	
18.5	18.5	22	9.5...38	38		LUCB38●● <sup>(1)</sup>		LUCD38●● <sup>(1)</sup>		

Cial. ref. of the control unit: replace dots by the coil code.

Coil voltage (V)	24---	24~	48...72 --- and 48~	110...220 --- and 110...240~
Coil code	BL	B	ES	FU

Cial. ref. of the control unit: replace dots by the coil code.

Coil voltage (V)	24...	24~	48...72 ... and 48~	110...220 ... and 110...240~
Coil code	BL	B	ES	FU

#### Magelis XBT NU HMI terminal (optional)

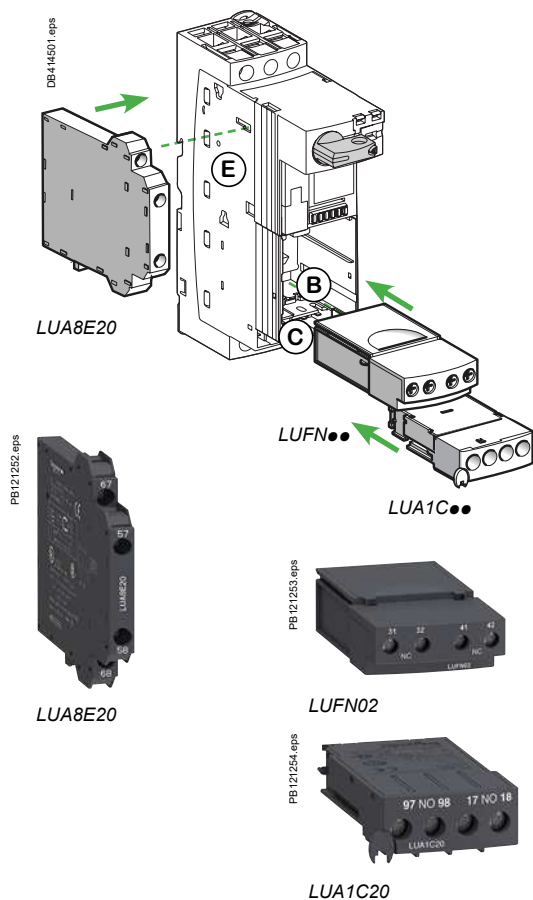
Provides display and modification of the LUCM multifunctional control unit settings. Modbus protocol – dialog up to 8 TeSys U<sup>(2)</sup>- Pre-loaded application and alarm pages, multi-language.

Designation	References
Magelis TeSys U terminal	XBTNU400
Connecting cable XBTNU400 to LUCM ●●BL, L = 2.50 m <sup>(2)</sup>	XBTZ938

<sup>(1)</sup> With BL or FU code only.

<sup>(2)</sup> A Modbus hub or - junction must be used when connecting several TeSys U.





### Signaling module and blocks

They provide dry contacts of Normally Open (NO) or Normally Closed (NC) type for signaling purpose. The monitored status can be either the motor running status or the protection device status, depending on the commercial reference of the module or block.

#### Common electrical characteristics

Standard operating voltage: 24...250 V AC/DC.

Maximum current: 5 A.

#### Compatibility - Positioning

The signaling module and blocks can be used in any power base

LUA8E20 is clipped on the E side of the power base

LUFN11, LUFN02, LUFN02 inserted into B cavity

LUA1C20, LUA1C11 inserted into C cavity

**Note:** B and C cavities may be already used for reverse-starters, communication.

Signaling module and blocks	Output	References
Module	1 NO + 1 NC	LUFN11
Motor running status: ON / OFF	2 NC	LUFN02
	2 NO	LUFN20
Block	2 NO	LUA1C20
Protection status: OPEN / CLOSED (OF) STANDBY / TRIPPED (SD)	1 NO + 1 NC	LUA1C11
Side block	2 NO	LUA8E20
Protection status: OPEN / CLOSED (OF)		

### Function modules

They provide analog output or dry contacts of Normally Open (NO) or Normally Closed (NC) type for measurement or signaling purpose.

#### Common electrical characteristics

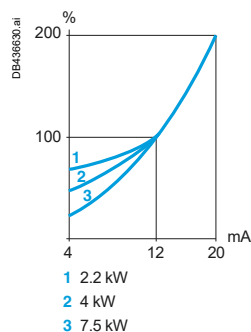
Standard operating voltage: 24...250 V AC/DC.

Maximum current: 5 A.

#### Compatibility - Positioning

The function modules can only be used in a LUB120, LUB320 or LUB380 power base, in cavity B.

Function modules	Output type	References
Electrical value: average current in each phase. The signal is the image of the percentage of $I_n$ . External 24 V DC power supply needed	Analog: 4-20 mA	LUFV2
Contact closes if average current in the phases = 105 % of $I_n$	1 NO	LUFW10
Contacts change state if tripping is caused by overload	1 NO + 1 NC	LUFDA11
Contact opens if overload tripping is reset with control pad or remotely	1 NC	LUFDA01
Contact closes if overload tripping is reset with control pad or remotely	1 NO	LUFDA10



LUFV2 typical response curve



# TeSys

## TeSys U All-in-one motor starters - Communication modules

### Product references



LUFC00



LULC033



LULC07



LU9BN11C



LU9MRC



ASILUFC51



LULC15



LU9BN11L



LU9MRL

### Auxiliary parallel wiring module <sup>(1)</sup>

#### Auxiliary parallel wiring module for Modicon Telefast system

##### Inputs

They collect the FWD, REV controls from an automation process.

An RJ45 parallel port is used, for connection to the 24 V DC outputs of a PLC.

##### Outputs

They give the position of the control pad and the state of the poles,

They provide 24 V DC controls to the LUB120, 320 or 380 power base coil via the LU9BN11C adapter (A2, A1) or to the LU2B12, 32, 38 power base coil with a LU9MRC adapter (A2, A1, A3).

#### Compatibility - Positioning

The parallel wiring module can only be used in any TeSys U power base,

**with LUC●● control unit with coil voltage**

Compatible with:

- Modicon TM3 (map I/O controllers for RJ45 M221, M241, M25)
- Modicon STB modules (I/O for automation island)
- Modicon Telefast (interfaces RJ45/HE10).

The parallel wiring module is inserted in cavity B.

**Note:** the parallel wiring module must be connected to a **LU9G02** or **LU9G03** Telefast distribution

**Note:** more details on parallel wiring page A4/16.

Designation	References
TeSys U power base parallel wiring module	LUFC00

### Communication modules

#### Communication modules

These modules send the control pad position and pole state to a communicating system (PLC, monitoring system,...)

They collect the Forward, Reverse motor controls from an automation process.

The status and controls are coded according to an industrial communication protocol, depending on the communication module.

Bus cable connection, external power supply by crew clamp terminals.

Connector for coil control (to A1-A3-A2) via a prewired connection (LU9BN● for 1-direction control, LU9MR● for 2-direction control)

#### Compatibility - Positioning

The communication modules can only be used in a LUB120, LUB320 or LUB380 power base, in cavity B.

Designation	References
TeSys U Modbus communication module	LULC033
TeSys U AS-Interface communication module	ASILUFC51
TeSys U Profibus DP communication module	LULC07
TeSys U CANopen communication module	LULC08
TeSys U DeviceNet communication module	LULC09
TeSys U Advantys STB communication module	LULC15

**Note:** Ethernet communication can be achieved with **LULC033** + **ConneXium TeSys Port** (ref. **TCSEQM113M13M**)

**Note:** more details on bus-type communication page A4/21.

### Prewired connectors

They provide the necessary electrical link between a parallel or communication module and the coil supply connector, on the power base or reverser block. Thus, ON-OFF (1 direction) or FORWARD-REVERSE (2 direction) controls can be achieved.

Prewired connection			References	Compatibility with modules
1 direction	Short cable	Side connection	LU9BN11C	LUFC00, LULC033, ASILUFC51
		Bottom connection	LU9BN11L	LULC07, 08, 09, 15
2 direction	Long cable	Side connection	LU9MRC	LUFC00, LULC033, ASILUFC51
		Bottom connection	LU9MRL	LULC07, 08, 09, 15

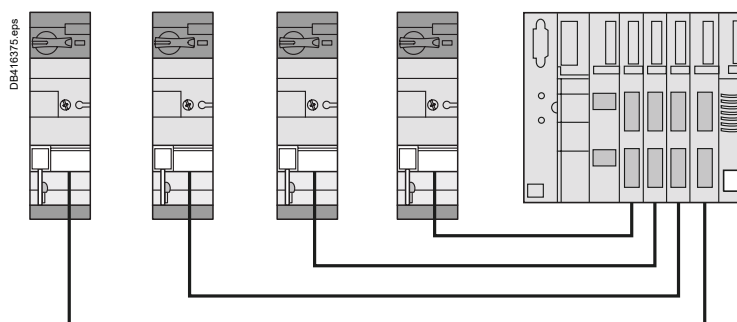








### Point-to-point wiring

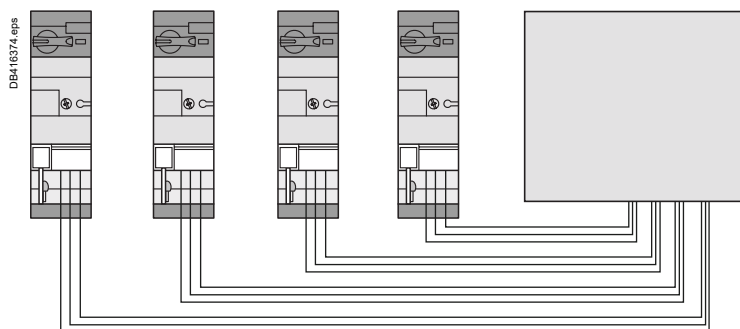


- The control inputs and signaling outputs of the starter are grouped in a single socket, usually RJ45. They are individually connected to PLC outputs and inputs.
- The wires run in parallel in a multicore cable equipped with a multipin connectors, RJ45 in the case of Telefast type system.
- 3 parallel wiring systems are available:
  - Modicon TM3, based on a RJ45 I/O module for M221, M241, M25 PLC
  - Modicon STB, based on I/O modules for automation island
  - Modicon Telefast: RJ45 / HE10 interfaces.
- Simple way of proximity wiring. Quick cabling. It is suitable for machine control panels when a large number of TeSys U starter-controller are installed.

### informations

- The control and signaling terminals of the starters are connected to the output and input terminals of a PLC. No specific connectors or cables are required.
- Conventional wiring mode, without optimization of the cabling time. May be suitable when a very small number of starters is used, with a very small number of links.

### Parallel cabling systems

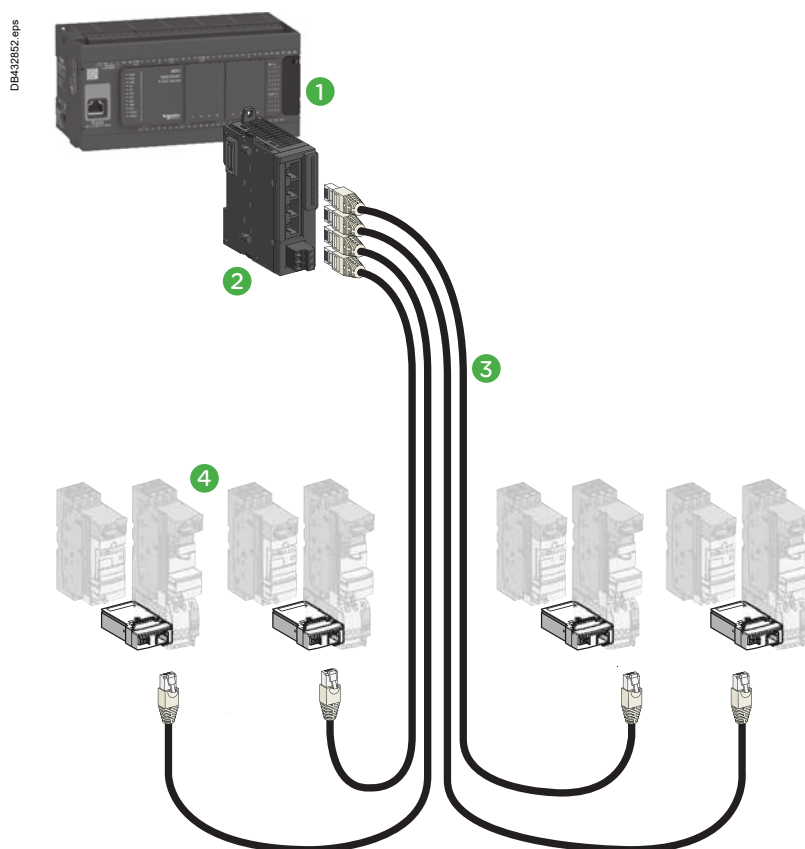




#### Integration in the Modicon TM3 wiring system

The TeSys U starter-controller are directly connected to a I/O module equipped with RJ45 connectors.

- ① Modicon M221, M241, M251 PLC's
- ② TM3XTY I/O module for 4 starters
- ③ LU9R●● cables with RJ45 connectors,
- ④ LUFC00 module for TeSys parallel connection (1 or 2 direction of rotation).





#### Integration in the Modicon Advantys STB system

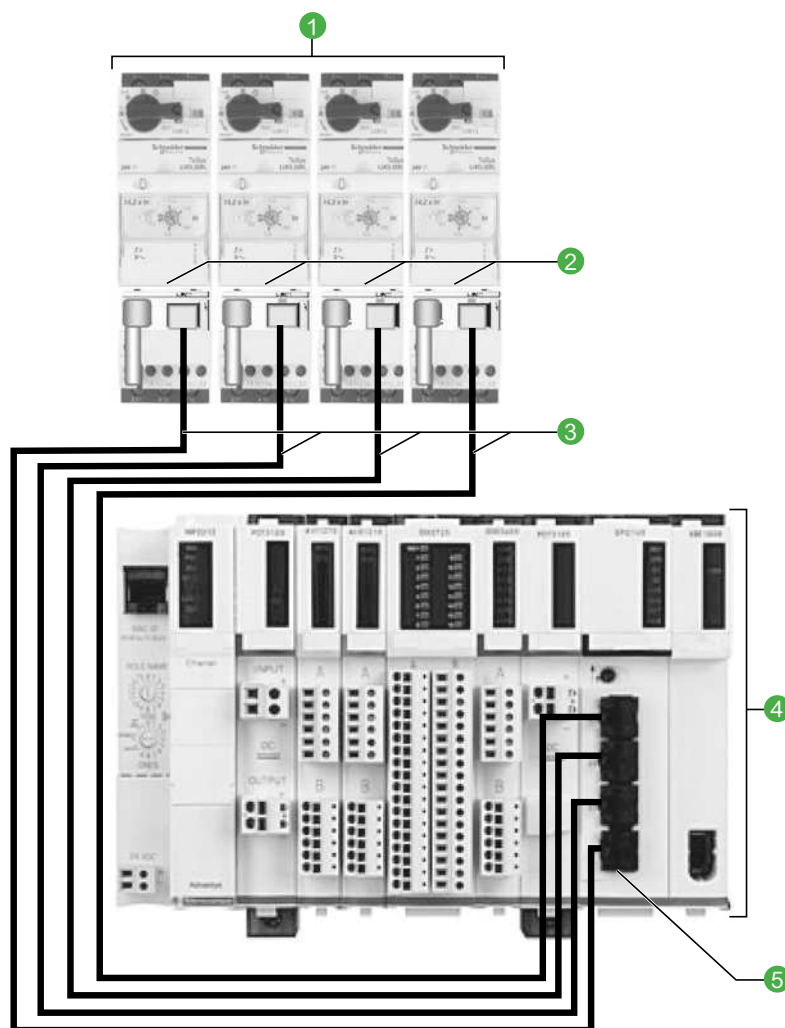
Advantys STB is a solution for remote I/O modules.

These communicate with the Modicon PLCs range thanks to a serial liaison, using the Advantys STB protocol.

In this example an Advantys I/O module is used to facilitate wiring.

Each of its four terminals receives a preassembled RJ45 cable connected to a TeSys U starter-controller.

- ❶ TeSys U LUB120, 320 or 380 power base (equipped with 24 V DC LUC●●●●BL control modules)
- ❷ TeSys module for parallel RJ45 wiring: LUFC00 + LU9BN11C (one direction) or LU9MRC (2 directions for LU2B12, 32 or 38 power base)
- ❸ RJ45 cables (2 connectors):  
 $\leq 3$  m: LU9R●●  
 $> 3$  m: 490 NTW000●● (5, 12, 40 or 80 m)
- ❹ PLC: Modicon range
- ❺ I/O Modicon Advantys module: STB EPI 2145K





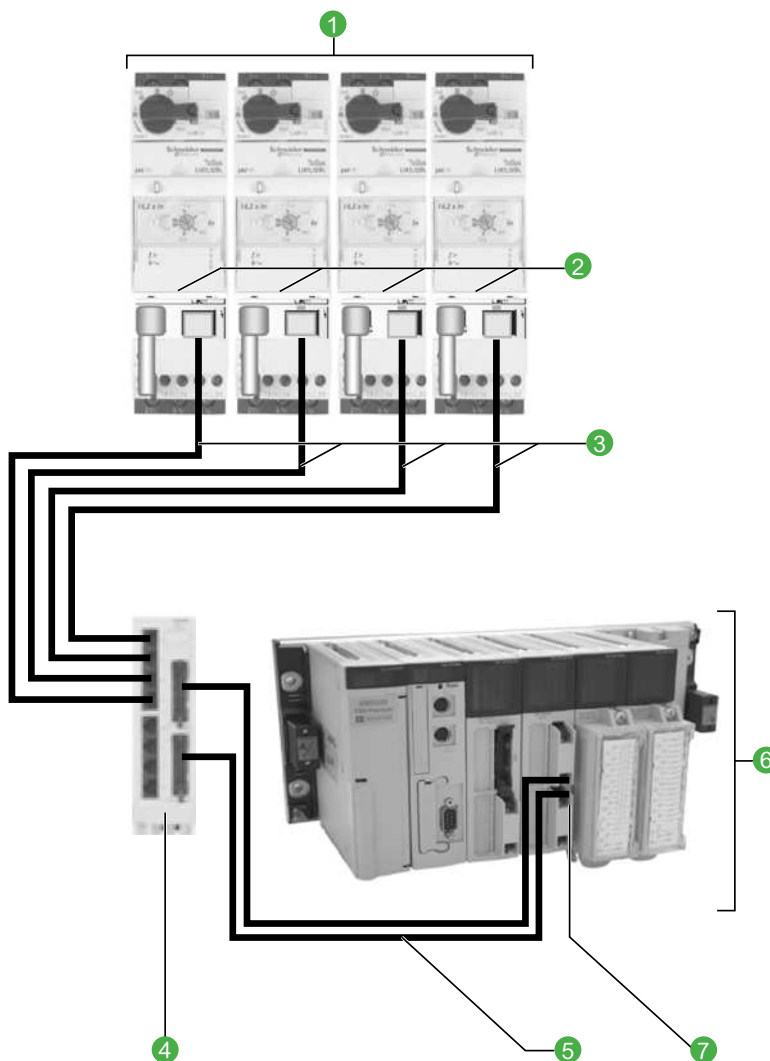
#### Integration in the Modicon Telefast system

The wiring hubb **LU9G0●** facilitates the connection to Modicon Premium PLCs.

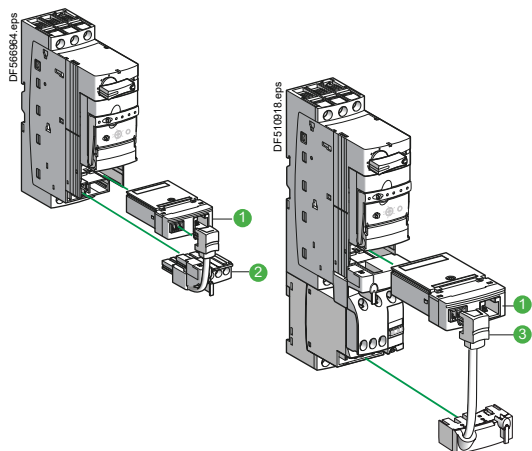
It adapts RJ45 connectors to HE10 available on the Telefast I/O modules.

Connection: up to 8 TeSys U per hubb.

- ① TeSys U LUB120, 320 or 380 power base (equipped with 24 V DC LUC●●●●BL control units)
- ② TeSys Module for parallel wiring RJ45: LUFC00 + LU9BN11C (one direction) or LU9MRC (2 directions for LU2B12, 32 or 38 power base)
- ③ RJ45 cables (2 connectors):  
 $\leq 3$  m: LU9R●●  
 $> 3$  m: 490 NTW000●● (5, 12, 40 or 80 m)
- ④ Telefast RJ45 / HE10 splitter box: LU9G02 or LU9G03 (different TeSys U connection capacities)
- ⑤ HE10 cables (2 connectors): TSXCDP●●●
- ⑥ PLC: Modicon Premium range
- ⑦ I/O module: TSX DMY 28FK







#### Components for connection of a starter - 1 direction of rotation

Designation	Reference
① Parallel connection module, RJ45 output 2 coil control inputs, 3 signal outputs	LUFC00
② Pre wired connector, one direction of rotation, for LUB120, 320 or 380 power base coil connection and one contact for emergency stop	LU9BN11C

#### Components for connection of a starter - 2 directions of rotation

Designation	Reference
① Parallel connection module, RJ45 output	LUFC00
③ Pre wired connector, 2 directions of rotation, for LU2B12, 32 or 38 power base coil connection and one contact for emergency stop	LU9MRC

TeSys U



LU9G02



LU9G03

#### Telefast RJ45/ HE10 splitter box

Designation	Reference
<b>Splitter box</b> Connection to TeSys U: 4 RJ45 connectors: for 1 to 4 TeSys U, 1 or 2 directions 4 RJ45 connectors: for 1 to 4 TeSys U, 1 direction Connection to PLC: 1 x HE10 connector - 20 channels, for pole status, alarms 1 x HE10 connector - 20 channels, for control. 24 V DC auxiliary power supply required	LU9G02
<b>Splitter box</b> Connection to TeSys U: 8 RJ45 connectors: for 1 to 8 TeSys U, 1 or 2 directions Connection to PLC: 1 x HE10 connector - 20 channels, for pole status, alarms 1 x HE10 connector - 20 channels, for control. 24 V DC auxiliary power supply required.	LU9G03

#### RJ45 connection cables, with 2 RJ45 connectors

0.3 m	LU9R03
1 m	LU9R10
3 m	LU9R30

#### HE10 connection cables, with 2 HE10/20 way connectors

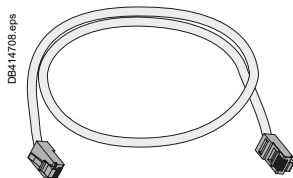
Section: AWG 22 / 0.324 mm <sup>2</sup>	
0.5 m	TSXCDP053
1 m	TSXCDP103
2 m	TSXCDP203
3 m	TSXCDP303
5 m	TSXCDP503
Section: AWG 28 / 0.080 mm <sup>2</sup> (flat cable)	
1 m	ABFH20H100
2 m	ABFH20H200
3 m	ABFH20H300

#### HE10 connection cables, with 1 x HE10/40 way connector (PLC side) and 1x HE10/20 way connector (Splitter box side)

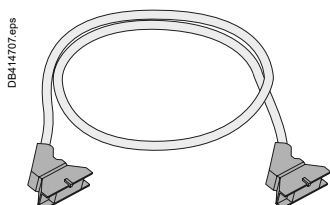
Section: 0.324 mm <sup>2</sup>	
0,5 m	BMXFCC053
1 m	BMXFCC103
2 m	BMXFCC203
3 m	BMXFCC303
5 m	BMXFCC503
10 m	BMXFCC1003

#### Cable with stripped wires (PLC side) 1 x HE10/20 ways connector (Splitter box side)

Section: AWG 22 / 0.324 mm <sup>2</sup>	
3 m	TSXCDP301
5 m	TSXCDP501



RJ45 cables.



HE10 cables.





## > Application functionality, topology

### ① Geographically expanded process

Many motors are scattered on the site, the process control requires individual control to ensure safety and proper operation.

TeSys U is a suitable communicating actuator. The integration of a bus communication module in the starter-controller saves space in the control board and simplifies wiring, compared to solutions based on conventional components (circuit breaker + contactor).

### ② Application: automatic motor control / monitoring

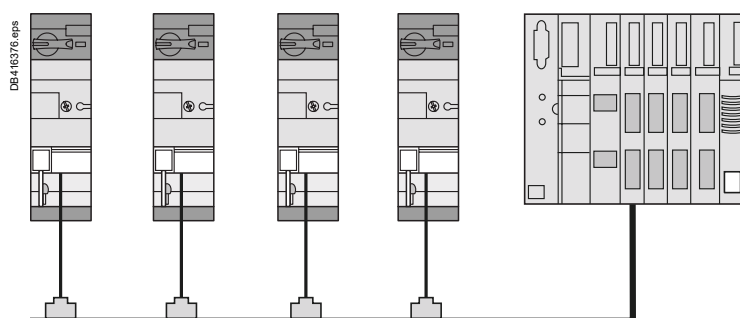
Thanks to a communication bus, starter-controllers are part of an automation system controlled by a PLC and (or) various communicating controllers.

These equipment can then share the status and alarm information related to each motor control and perform specific treatments.

### ③ Bus-type connection

This type of connection allows different topologies (star, ring ...) and supports various protocols dialogue. It is therefore recommended for geographically expanded process, in order to simplify wiring and ensure multiple-controller management.

- The bus wiring interconnects TeSys U starters controllers and components of the installation via a single the cable.
- Commands and status are coded according to the selected protocol and transmitted on the communication bus.
- This wiring is simple, usually a shielded (or not) pair of wires, suitable for monitored automation, regardless of the number of TeSys U and their locations.



### Available TeSys U status and controls via a communication module

Control unit	LUCA	LUCB LUCC LUCD	LUCM
Starter status (ready, running, fault)	■	■	■
Start and Stop commands	■	■	■
Thermal overload alarm		■	■
Remote reset via the bus		■	■
Indication of motor load		■	■
Fault signalling and differentiation		■	■
Remote programming and monitoring of all functions			■
"Log" function			■
"Monitoring" function			■
Alarms (overcurrent, ...)			■



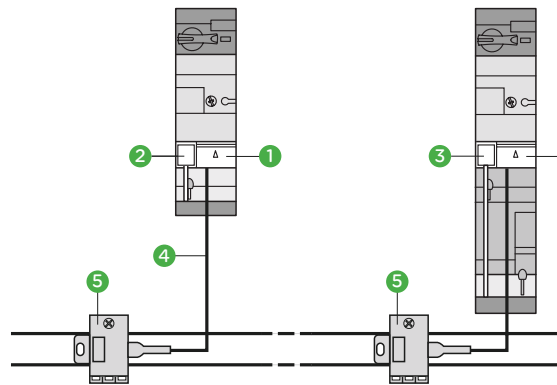
## Network

## Architecture

## Component references

## AS Interface

Cabling system for rapidly connecting sensors and actuators to the controller.  
A single cable provides both data transmission and power to sensors.



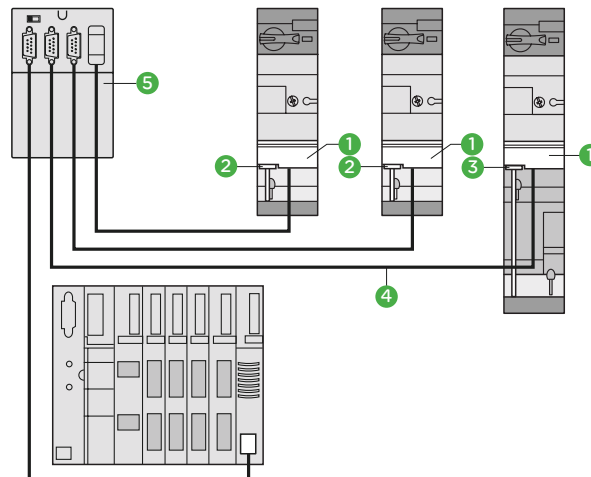
- 1 ASILUFC5 or ASILUFC51
- 2 LU9BN11C
- 3 LU9MRC
- 4 XZCG0142
- 5 TCSATV01N2

[Details page](#)

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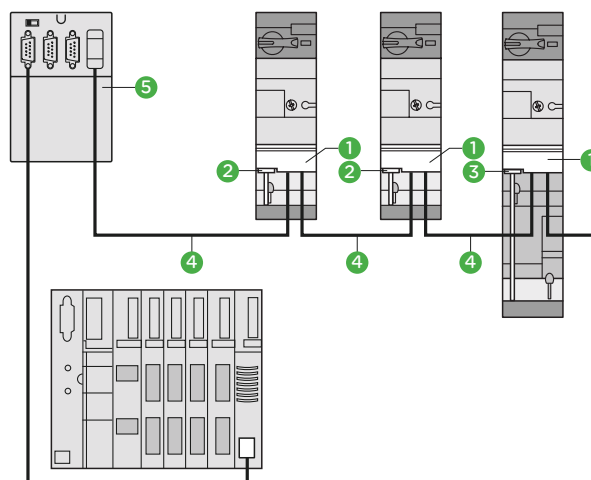
## CANopen

Etoile



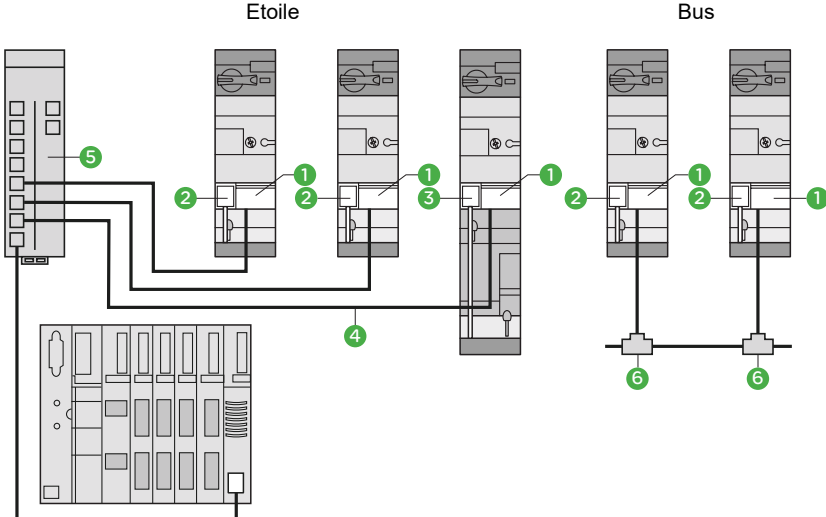
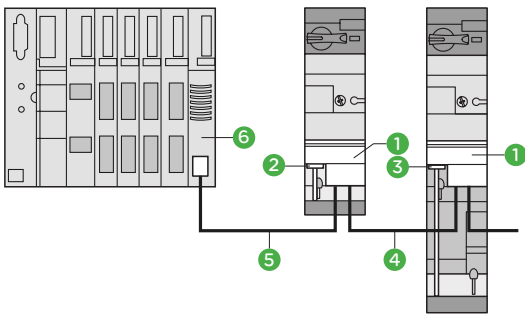
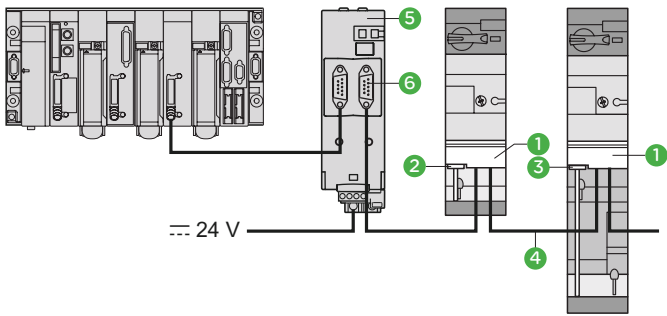
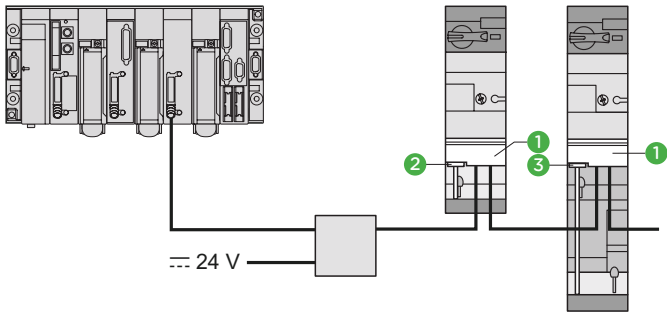
- 1 LULC08
- 2 LU9BN11L
- 3 LU9MRL
- 4 TSXCANC●●●
- 5 TSXCANTDM4
- 6 TSXCPP110

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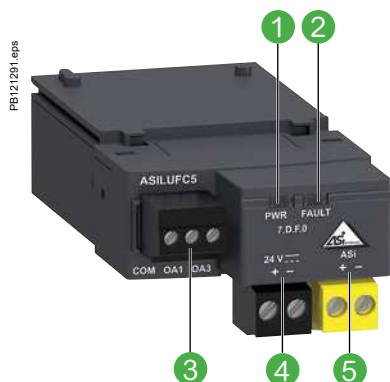
Bus[Details page](#)

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Network	Architecture	Component references
Modbus		<ol style="list-style-type: none"> <li>1 LULC033</li> <li>2 LU9BN11C</li> <li>3 LU9MRC</li> <li>4 VW3A8306R...</li> <li>5 LU9GC3</li> <li>6 VW3A8306TF</li> </ol>
<p>Details page <a href="#">A4/26</a></p>	Advantys STB	
<p>Starter-controllers communicate using ADVANTYS STB protocol to fit into a remote I/O architecture.</p>		<ol style="list-style-type: none"> <li>1 LULC15</li> <li>2 LU9BN11L</li> <li>3 LU9MRL</li> <li>4 LU9RDD...</li> <li>5 LU9RCD</li> <li>6 STBxBE1100</li> </ol>
<p>Details page <a href="#">A4/27</a></p>	Profibus-DP (Decentralized Peripherals)	
<p>is used for connecting actuators and sensors to a central controller for applications in industrial production. The standard bus provides a number of diagnostic means</p>		<ol style="list-style-type: none"> <li>1 LULC07</li> <li>2 LU9BN11L</li> <li>3 LU9MRL</li> <li>4 LU9RPB010 LU9RPB100 LU9RPB400</li> <li>5 LU9AD7</li> <li>6 LU9GC7</li> </ol>
<p>Details page <a href="#">A4/28</a></p>	DeviceNet	
<p>is used for connecting actuators and sensors to a central controller for applications in industrial production. The standard bus provides a number of diagnostic means</p>		<ol style="list-style-type: none"> <li>1 LULC09</li> <li>2 LU9BN11L</li> <li>3 LU9MRL</li> </ol>
<p>Details page <a href="#">A4/29</a></p>		





- 1 Green LED: AS-Interface voltage present
- 2 Red LED: AS-Interface or module fault
- 3 Outputs for starter commands
- 4 Black connector for connection to 24 V auxiliary power supply
- 5 Yellow connector for connection to the AS-Interface system

The ASILUFC5 communication module, combined with the power base and control unit is used to control TeSys U starters-controllers via DeviceNet bus.  
The LULC09 communication module is slave type.

### Module Specifications

#### I/O terminal block

- Powered by external 24 V DC (power supply not included):
- 2 x configurable inputs for binary sensors
- 1 x 24 V DC output - 0.5 A local auxiliary command.

#### Connectors

- For TeSys U 24 V DC coil (common, direction 1, direction 2).
- For AS-Interface bus.

#### Signaling

- Module Status - Error - 24 V, by LED.

### Tesys components

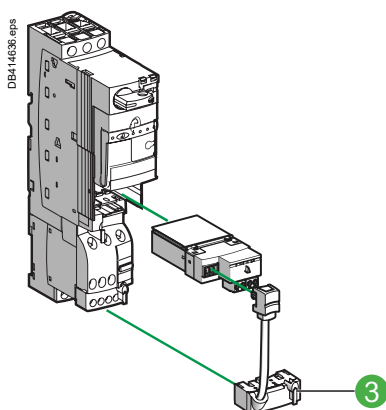
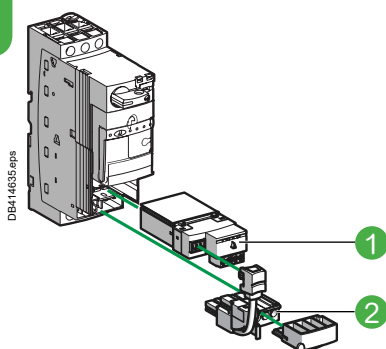
Description	Mark	Max number of slaves	References
AS-Interface communication module	1	31	ASILUFC5
		62	ASILUFC51
Pre-wired connector: coil - LUB powerbase	2	-	LU9BN11C
Pre-wired connector: coil - LUB2B powerbase	3	-	LU9MRC

### Connection of the communication module

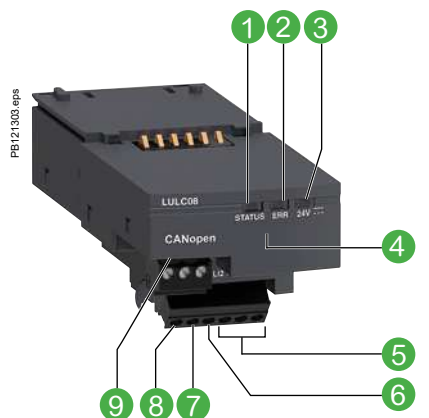
By a "Y" cable with:

- TeSys U side, 2 connectors (bus + power),
- Bus side, one connector to be connected to the AS-Interface TCSATV01N2 tap-off.

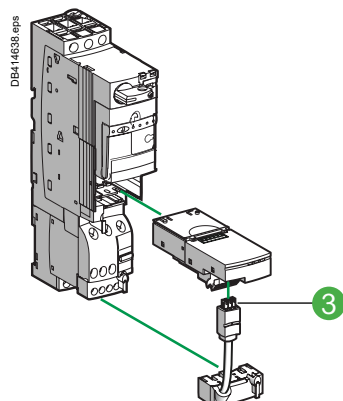
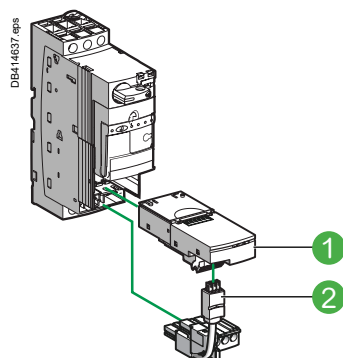
Description	References
AS-Interface / TeSys U branch cable, L = 2 m	XZCG0142
AS-Interface Tap-off	TCSATV01N2







- 1 LED indicating module status
- 2 Fault signalling LED
- 3 LED indicating 24 V supply ON for outputs OA1, OA3 and LO1
- 4 SUB-D connector for bus link
- 5 24 V supply connection
- 6 Discrete input
- 7 Discrete input
- 8 Discrete output
- 9 Outputs for starter commands



The LULC08 communication module, combined with the power base and control unit is used to control TeSys U starters-controllers via CANopen bus. The LULC08 communication module is slave type.

### Module Specifications

#### I/O terminal block

- Powered by external 24 V DC (power supply not included):
  - 2 x configurable inputs for binary sensors
  - 1 x 24 V DC output - 0.5 A local auxiliary command.

#### Connectors

- For TeSys U 24 V DC coil (common, direction 1, direction 2).
- For CANopen bus.

#### Signaling

- Module Status - Error - 24 V, by LED.

### Tesys components

Description	Item	References
CANopen communication module	1	LULC08
Pre-wired connector: coil - LUB powerbase	2	LU9BN11L
Pre-wired connector: coil - LUB2B powerbase	3	LU9MRL

### Compatibility of CANopen communication module with control units

LUCA●●BL / B●●BL / C●●BL / D●●BL	All versions marketed after 2T0481 <sup>(1)</sup>
LUCM●●BL	All versions ≥ V3.2
LUCMT1BL	All versions ≥ V3.2

(1) This "date code" is made up as follows:  
 2T or 2C: factory code.  
 04, 05, 06 and so on: year of manufacture.  
 08: week.  
 1: 1st day of the week.

### How to get information on the design of a CANopen architecture and the choice of network accessories

Consult the library of downloadable documents on [schneider-electric.com](http://schneider-electric.com) by searching on the name of the communication protocol.

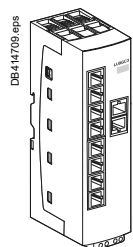
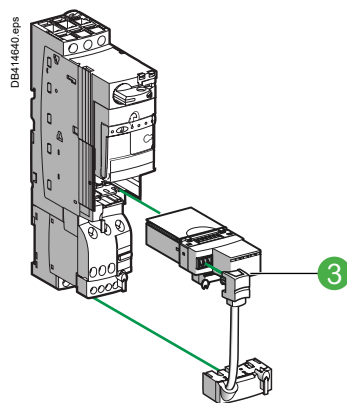
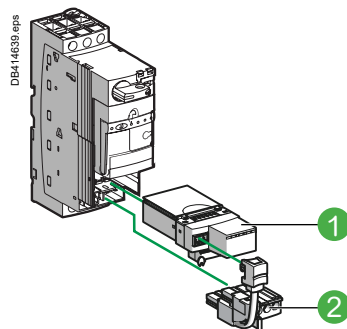


## LULC033



- ① Module status signalling LED
- ② 24 V supply connection
- ③ RJ45 connector for RS485 Modbus link
- ④ 2 discrete inputs
- ⑤ 1 discrete output
- ⑥ Outputs for starter commands

TeSys U



LULC033 communication module, combined with the power base and control unit is used to control TeSys U starters-controllers via Modbus.

## Module Specifications

## I/O terminal block

- Powered by external 24 V DC (power supply not included):
- 2 x configurable inputs for binary sensors (on LULC033 only)
- 1 x 24 V DC output - 0.5 A local auxiliary command.

## Connectors

For TeSys U 24 V DC coil (common, direction 1, direction 2).

- RJ45, For Modbus line.

## Signaling

- Module Status - Error - 24 V, by LED.

## Tesys components

Description	Item	Bin. input	References
Modbus communication module	①	2	LULC033
Pre-wired connector: coil - LUB powerbase	②	-	LU9BN11C
Pre-wired connector: coil - LUB2B powerbase	③	-	LU9MRC

## Modbus hub

Description	Length (m)	References
Modbus communication distributor	-	LU9GC3
Cables fitted with 2 x RJ45 connectors	0.3	VW3A8306R03
	1	VW3A8306R10
	3	VW3A8306R30
Tees derivations	0.3	VW3A8306TF03
	1	VW3A8306TF10
Description	References	
RS 485 line terminator	VW3A8306R	

## Compatibility of Modbus communication modules

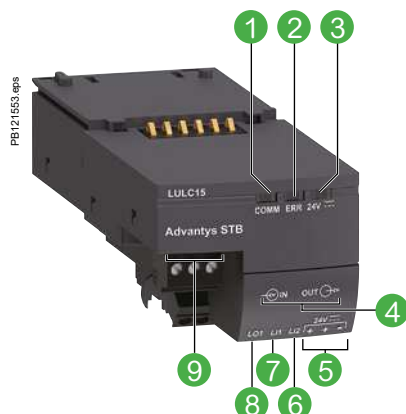
Communication modules (software version)		LUCLC033 from V2.1	LUCLC033 from V2.2
Power base	LUB●● / LU2B●2	■	■
	LUTM●●BL	■	■
Control unit	LUCA●●BL		■
	LUCB●●BL		■
	LUCC●●BL		
	LUCD●●BL		
	LUCM●●BL		■ <sup>(1)</sup>
	LUCBT●●BL	■	
	LUCDT●●BL		
	LUCMT●●BL	■	

(1) Except LUCM●●BL V1.04 and V1.06.

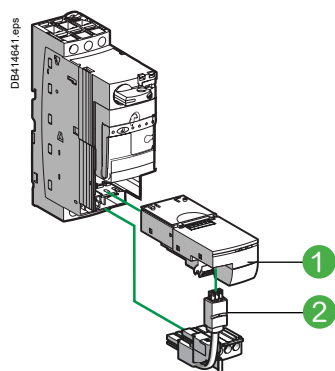
## How to get information on the design of a Modbus architecture and the choice of network accessories

Consult the library of downloadable documents on [schneider-electric.com](http://schneider-electric.com) by searching on the name of the communication protocol.

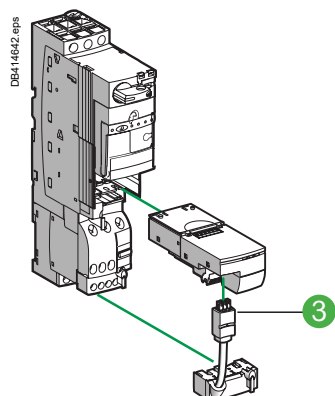




- 1 Two-colour LED indicating module status
- 2 Fault signalling LED
- 3 LED indicating that 24 V supply is ON
- 4 Bus connectors
- 5 24 V supply connection
- 6 Discrete input
- 7 Discrete input
- 8 Discrete output
- 9 Outputs for starter commands



LUB + LULC15 + LU9BN11L



LU2B + LULC15 + LU9MRL

Communication module LULC15 allows direct connection of TeSys U starter-controllers and controllers on an Advantys STB island, between two segments or at the end of a segment. The starter-controller will then be able to make use of the services provided by Advantys STB: self-addressing, autobaud, fallback positions.

### Module Specifications

#### I/O terminal block

- Powered by external 24 V DC (power supply not included):
- 2 x configurable inputs for binary sensors (on LULC033 only)
- 1 x 24 V DC output - 0.5 A local auxiliary command.

#### Connectors

- For TeSys U 24 V DC coil (common, direction 1, direction 2).
- For Advantys STB bus.

#### Signaling

- Com - Error - 24 V, by LED.

### Tesys components

Description	Item	References
Advantys STB communication module	1	LULC15
Pre-wired connector: coil - LUB powerbase	2	LU9BN11L
Pre-wired connector: coil - LUB2B powerbase	3	LU9MRL

### Cables

Description	Length (m)	References
Cables fitted with connectors, one straight and one elbowed	0.3	LU9RCD03
	1	LU9RCD10
	3	LU9RCD30
	5	LU9RCD50
Cables fitted with two straight connectors	0.3	LU9RDD03
	1	LU9RDD10
	3	LU9RDD30

### Compatibility of Advantys STB communication module with control units

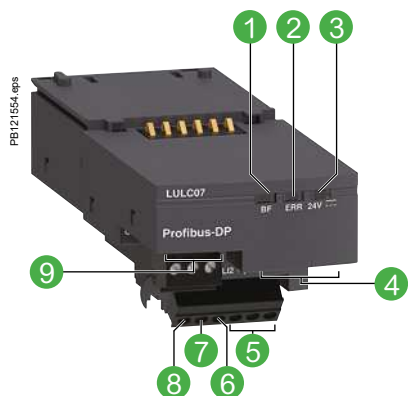
LUCA●●BL / B●●BL / C●●BL / D●●BL	All versions marketed after 2T0481 <sup>(1)</sup>
LUCM●●BL	All versions ≥ V3.2
LUCMT1BL	All versions ≥ V3.2

(1) This "date code" is made up as follows:  
 2T or 2C: factory code.  
 04, 05, 06 and so on: year of manufacture.  
 08: week.  
 1: 1st day of the week.

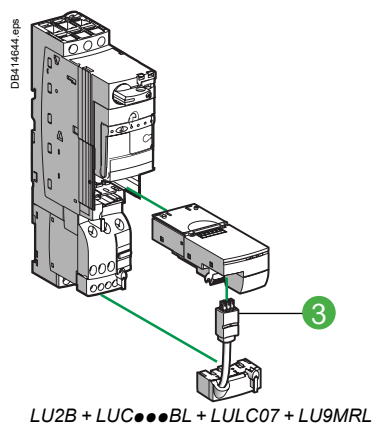
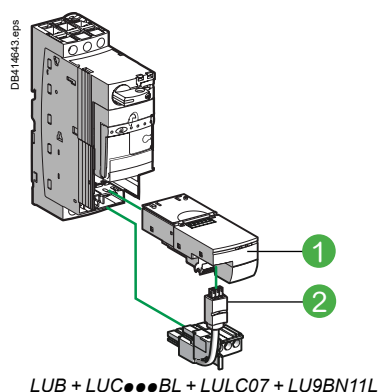
### How to get information on the design of a Advantys STB architecture and the choice of network accessories

Consulter la librairie des documents téléchargeables sur le site [schneider-electric.com](http://schneider-electric.com) en faisant une recherche sur le nom du protocole de transmission.





- ① Two-colour LED indicating module status
- ② Fault signalling LED
- ③ LED indicating 24 V supply ON for outputs OA1, OA3 and LO1
- ④ SUB-D connector for bus link
- ⑤ 24 V supply connection
- ⑥ Discrete input
- ⑦ Discrete input
- ⑧ Discrete output
- ⑨ Outputs for starter-controller commands (non-reversing and reversing)



When used in conjunction with the power base and control unit, communication module LULC07 allows TeSys U starter-controllers to be controlled via Profibus DP (Deported Periphery) bus.

Communication module LULC07 is of the slave type.

### Module Specifications

#### I/O terminal block

- Powered by external 24 V DC (power supply not included):
  - 2 x configurable inputs for binary sensors
  - 1 x 24 V DC output - 0.5 A local auxiliary command.

#### Connectors

- For TeSys U 24 V DC coil (common, direction 1, direction 2).
- For Profibus DP bus.

#### Signaling

- Com - Error - 24 V, by LED.

### Tesys components

Description	Item	References
Profibus DP communication module	①	LULC07
Pre-wired connector: coil - LUB powerbase	②	LU9BN11L
Pre-wired connector: coil - LUB2B powerbase	③	LU9MRL

### Components for connection to the bus and to the installation

The 24 V DC -Aux supply to Profibus DP modules LULC07 must pass through power supply module LU9GC7.

LULC07 modules must be connected to the LU9GC7 splitter box in order to be powered.

The number of TeSys U starter-controllers that can be powered by an LU9GC7 module is limited by the maximum current (1.5 A) which it can deliver.

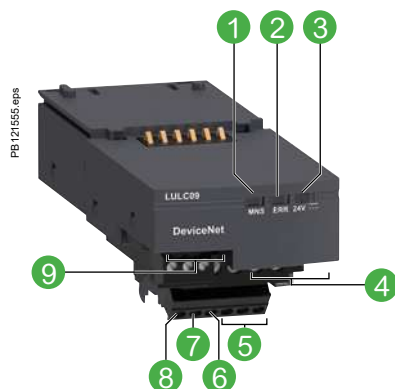
The 24 V supply for the inputs/outputs must be provided separately..

Description	Length (m)	References
Profibus DP power supply module	-	LU9GC7
Profibus DP connector	-	LU9AD7
Profibus DP cables 2-wire	100	TSXPBSCA100
	400	TSXPBSCA400
Profibus DP cables 4-wire	10	LU9RPB010
	100	LU9RPB100
	400	LU9RPB400

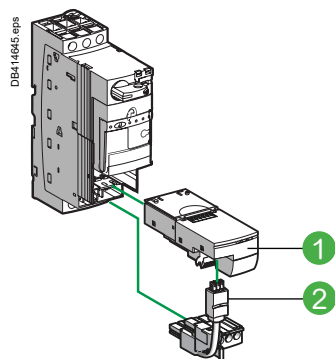
### How to get information on the design of a Profibus DP architecture and the choice of network accessories

Consult the library of downloadable documents on [schneider-electric.com](http://schneider-electric.com) by searching on the name of the communication protocol.

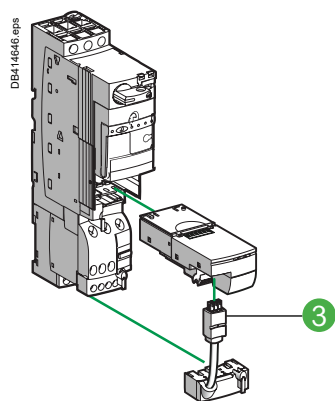




- 1 LED indicating module status
- 2 Fault signalling LED
- 3 LED indicating 24 V supply ON for outputs OA1, OA3 and LO1 and 24 V bus
- 4 DeviceNet connector for bus link
- 5 24 V supply connection
- 6 Discrete input
- 7 Discrete input
- 8 Discrete output
- 9 Outputs for starter-controller commands (non-reversing and reversing)



LUB + LUC...BL + LULC07 + LU9BN11L



LU2B + LUC...BL + LULC07 + LU9MRL

When used in conjunction with the power base and control unit, communication module LULC09 allows TeSys U starter-controllers to be controlled via DeviceNet bus. Communication module LULC09 is of the slave type.

### Module Specifications

#### I/O terminal block

- Powered by external 24 V DC (power supply not included):
  - 2 x configurable inputs for binary sensors
  - 1 x 24 V DC output - 0.5 A local auxiliary command.

#### Connectors

- For TeSys U 24 V DC coil (common, direction 1, direction 2).
- For DeviceNet bus.

#### Signaling

- Com - Error - 24 V , by LED.

### Tesys components

Description	Item	References
DeviceNet communication module	1	LULC09
Pre-wired connector: coil - LUB powerbase	2	LU9BN11L
Pre-wired connector: coil - LUB2B powerbase	3	LU9MRL

### How to get information on the design of a DeviceNet architecture and the choice of network accessories

Consult the library of downloadable documents on [schneider-electric.com](http://schneider-electric.com) by searching on the name of the communication protocol.



PB 121537 eps



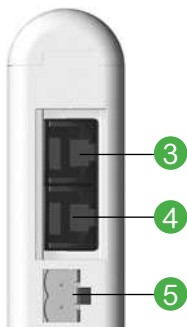
TeSys U



DF526109-17-M eps



561512 eps



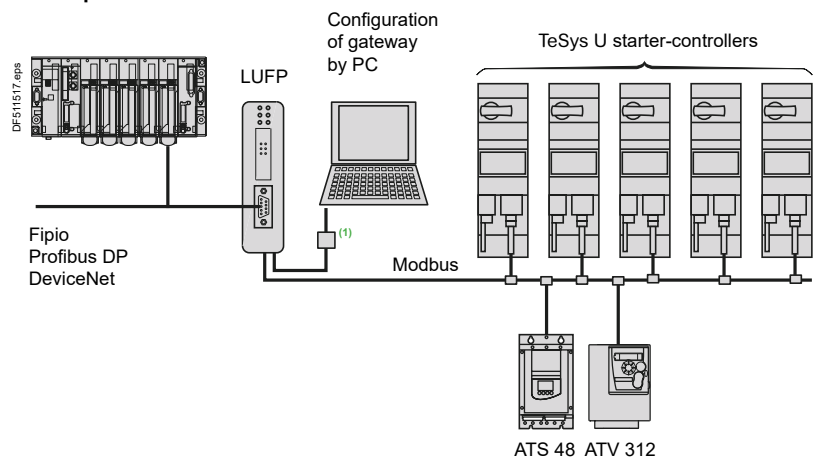
### Introduction

LUFP communication gateways allow connection between the Modbus serial link and Fipio, Profibus DP or DeviceNet field buses.

After configuration, these gateways manage information which can be accessed by the Modbus serial link and make this information available for read/write functions (command, monitoring, configuration and adjustment) on the field buses.

An LUFP communication gateway consists of a box which can be clipped onto a 35 mm omega rail, allowing connection of up to 8 Slaves connected on the Modbus serial link.

### Example of architecture



### Communication gateway LUFP

Description	Reference
Fipio / Modbus gateway	LUFP1
Profibus DP / Modbus gateway	LUFP7
DeviceNet / Modbus gateway	LUFP9

### Description

#### Front panel of the product

- ① LED indicating :
  - communication status of the Modbus serial links,
  - gateway status,
  - communication status of the Fipio, Profibus DP or DeviceNet bus.
- ② Connectors for connection to Fipio, Profibus DP or DeviceNet buses.

#### Underside of product

- ③ RJ45 connector for connection of the Modbus serial link
- ④ RJ45 connector for link to a PC
- ⑤ 24 V power supply

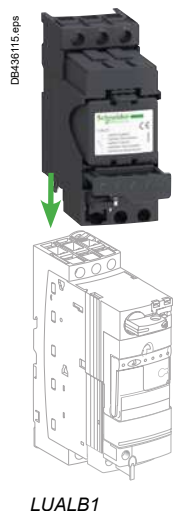
### Software set-up

For the Fipio bus, software set-up of the gateway is performed using either PL7 Micro/Junior/Pro software or ABC Configurator software. For the Profibus DP and DeviceNet buses, software set-up is performed using ABC Configurator.

This software is included in the TeSys U user's manual.

(1) Connection kit for PowerSuite software workshop.





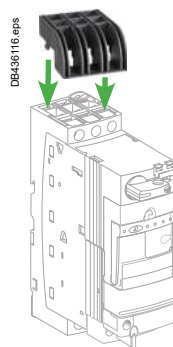
LUALB1



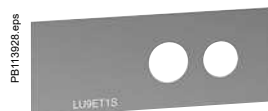
LUALF1



LA9LB920



LU9SP0



LU9ET1S

### Short-circuit current limiter block

To be connected in series and upstream of a TeSys U starter-controller. It increases its ability to withstand the short circuit current from 50 kA to 100 or 130 kA under 400 V.

Principle: under the action of a short-circuit, the opening of two contacts of each phase of the limiter creates a resistive arc. The current then decreases to a value tolerable by a TeSys U power base.

#### Limiter blocks and accessories

Description	Breaking capacity I <sub>q</sub> (kA)		I <sub>e</sub> (A)	I <sub>th</sub> (A)	Mounting	Unit reference
	≤ 440 V	690 V				
Limiter-disconnector (1 x LUALF1 cartridge supplied)	130	70	-	32	Direct on power base up to 15 kW/32 A	LUALB1 <sup>(1)</sup>
Limiter	100	35	32	63	Separate	LA9LB920 <sup>(2)</sup>
limiter cartridge for LUALB1	130	70	-	-	Limiter-disconnector	LUALF1

<sup>(1)</sup> Must be connected to one power base only.

<sup>(2)</sup> Can be connected to multiple TeSys U power bases in parallel with limitation :

- Total I<sub>th</sub> max 63 A
- Total nominal current (I<sub>e</sub>) 32 A from motor with simultaneous start (LA9LB920 could not withstand higher inrush peak current)

### Phase barrier

Ensures a complementary electrical insulation between phases.

690 V AC network: compulsory.

440 V AC network: compulsory when assembling a UL508 type E compliant motor starter (Self Protected Starter).

Description	Use	Mounting	Reference
Phase separator	LUB or LU2B 12 or 120 LUB or LUB2B 32 or 320 LUALB1	Live terminals L1, L2, L3	LU9SP0

### Clip-in labels

Can be clipped on any TeSys U power base, on LU6MB0●● inverter block, and Linergy HK busbar system.

#### Marking accessory

Description	Sold by lot of	Reference per unit
Clip-in label 8 x 18 mm	100	LAD90

### Safety-chain identification - Red label

The red sticker is dedicated to TeSys U LUCA, LUCB, LUCC, LUCD and LUCL control units.

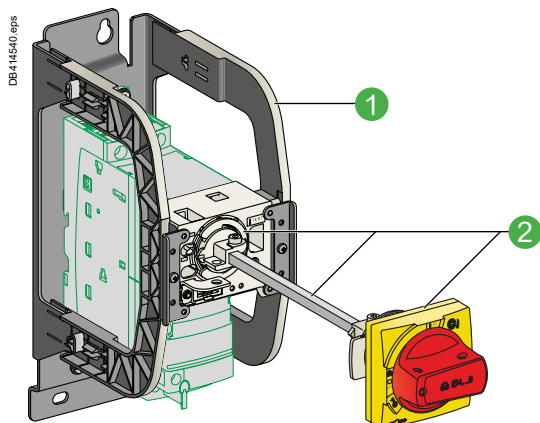
Description	Reference per unit
Retrofit safety-chain identification sticker	LU9ET1S



# TeSys

## TeSys U All-in-one motor starters - Rotary handles

### Product references



LU9APN21 mounting kit



GVAPA1 long shaft



GVAPK12 shaft support plate for deep enclosure



GVAPP1 spacer base (retrofit accessory)



GVAPR54 red handle, IP 54



GVAPYPHP external handle protection frame



GVAPL01 "Laser square" plotting tool

### Extended rotary handle

Allows a circuit breaker or a TeSys U starter-controller installed in back of an enclosure to be operated from the front panel.

The rotary handle can be black or red/yellow, IP54 or IP65. It includes a function for locking the circuit breaker or the starter in the O (OFF) or I (ON) position (depending on the type of rotary handle) by means of up to 3 padlocks with a shank diameter of 4 to 8 mm.

The extension shaft must be adjusted to the depth of the enclosure.

The IP54 rotary handle is fixed with a nut (Ø22) to make it easier to assemble.

### Mounting kit

① TeSys U Power base bracket; its horseshoe shaped sides hold the rotary mechanism facing the original handle.

② Mechanism, shaft and handle; the shaft enters the handle attached to the door during closing.

### Long shaft

■ to be cut to the required length. Equipped with a connection endpiece.

### Shaft support plate for deep enclosure

■ Provides horizontal guiding of the shaft, when the door is open.

### Spacer base (retrofit accessory)

■ Fixed on a side of the box, for heightening an GVAP●●● handle.

### Handle

■ Delivered as a single unit, to be fitted on a side of the enclosure.

*Note: references below are suitable for TeSys U power bases after 2004.*

### "Laser Square" Tool

■ On the principle of an angle extended with a laser beam, the "Laser Square" facilitates tracing the piercing marks on the door or the sides of an enclosure.

### "Safety" stickers

■ Marking: Electrical hazard, etc.

Description		Tripping indication	Reference
Mounting kit	Black handle, with error status, IP54	●	LU9APN21
	Red handle, with error status, IP54	●	LU9APN22
	Red handle, without error status, IP65	-	LU9APN24
Separate elements	Long shaft = 315 mm	-	GVAPA1
	Shaft (≥ 300 mm) support plate for deep enclosure	-	GVAPK12
	Spacer base	-	GVAPP1
	Black handle, IP54	●	GVAPB54
	Red handle, IP54	●	GVAPR54
	Black handle, IP65		GVAPB65
	Red handle, IP65		GVAPR65
Tool	"Laser square" plotting tool		GVAPL01
"Safety" stickers	French (x10)		GVAPSFR
	English (x10)		GVAPSEN
	German (x10)		GVAPSD
	Spanish (x10)		GVAPSES
	Chinese (x10)		GVAPSCN
	Portuguese (x10)		GVAPSP
	Russian (x10)		GVAPSRU
	Italian (x10)		GVAPSIT
External handle protection frame for TeSys U	Yellow frame		GVAPYPHP
	Black frame		GVAPBPHP



# TeSys

## TeSys U All-in-one motor starters - Handle mounting kit for MCC drawers

### Product references



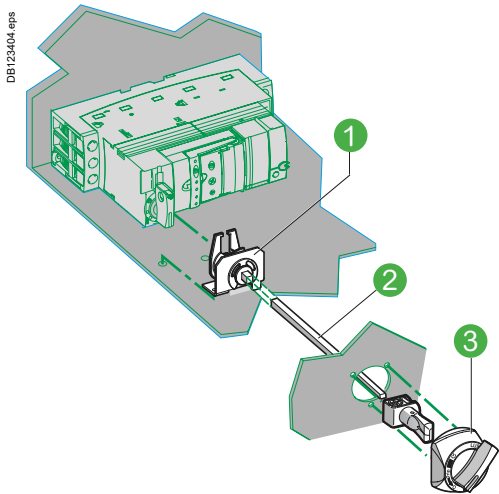
#### MCC drawers (Motor Control Center)

The drawers are composed of:

- a fixed part, in the frame of the panel,
- a fully withdrawable part, integrating the protection, control and automation components.

With a height of 3/4/6/8/12/18/24/36 modules, they allow the assembling of motor protection/control feeders:

- Direct, one direction of rotation
- Direct, 2 directions of rotation
- Star-delta
- Dahlander (2 speeds)
- 2-speed, separate winding
- Motor drives from 0 to 500 kW
- Soft starters of 0 to 75 kW.



#### Mounting kit and handle for MCC drawer

Together, this provides manual control of a TeSys U starter-controller from the front face of the drawer.

As the clamping part on top of TeSys U control pad is open, the kit may be used on TeSys U power bases before 2005.

##### Mounting kit + small handle

Description	Item	Reference
Handle with mounting kit for MCC drawer	1 + 2 + 3	LU9AP20

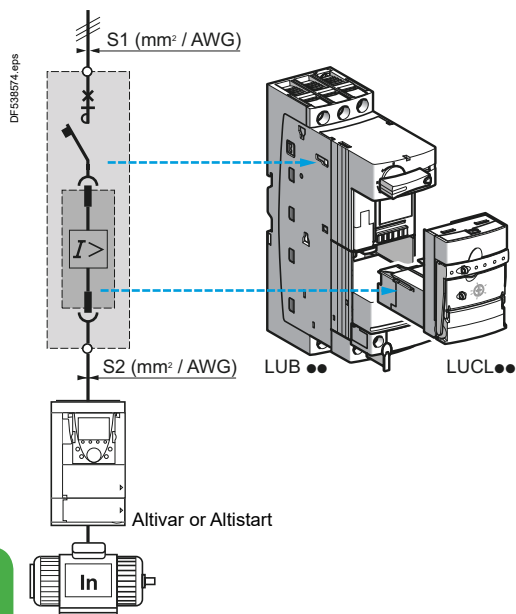




# TeSys

## TeSys U All-in-one motor starters - Use with soft starter / Variable Speed Drive - LUCL control module

### Product references



### Introduction

When installed upstream of a variable speed controller or soft start unit, control unit LUCL●●, used in conjunction with an LUB12 or LUB32 power base, provides:

- isolation,
  - short-circuit protection of the motor starter.
- (variable speed controller-based or soft start unit-based motor starters).

**Note:** control unit LUCL, when used in conjunction with power base LUB12 or LUB32, conforms to standard IEC 60947-6-2.

### Installation regulations

When the length of the cable between the TeSys U starter and the variable speed controller is more than 1.5 m, the c.s.a. of the cable between the variable speed controller and the TeSys U starter (S2) must be equal to the c.s.a. of the cable upstream of TeSys U (S1).

### Description of LUCL magnetic control unit

- ① Extraction and locking handle
- ② Sealing of locking handle
- ③ Dial for magnetic adjustment of motor In
- ④ Locking of settings by sealing the transparent cover

### References

Description	Line current of the variable speed controller or soft start unit	Reference <sup>(1)</sup>
	A	
Magnetic control unit	0.15...0.6	LUCLX6●●
	0.35...1.4	LUCL1X●●
	1.25...5	LUCL05●●
	3...12	LUCL12●●
	4.5...18	LUCL18●●
	8...32	LUCL32●●

<sup>(1)</sup> Standard control circuit voltage:

Volts	24	48...72	110...240
---	BL <sup>(2) (3)</sup>	—	—
~	B	—	—
--- or ~	—	ES <sup>(4)</sup>	FU <sup>(5)</sup>

<sup>(2)</sup> Voltage code to be used for a starter-controller with communication module.

<sup>(3)</sup> d.c. voltage with maximum ripple of ±10 %.


<sup>(4)</sup> ---: 48...72 V, ~: 48 V.


<sup>(5)</sup> ---: 110...220 V, ~: 110...240 V.



Control unit and associated power base selection						
Functions provided	Maximum motor power ratings 50/60 Hz			Power base reference	Control unit reference	Line current
	< 400/415 V	500 V	690 V			
	KW	KW	KW			A
■ Short-circuit protection	0.09	–	–	LUB12 or LUB32	LUCLX6●●	0.15...0.6
■ Manual reset	0.25	–	–	LUB12 or LUB32	LUCL1X●●	0.35...1.4
	1.5	2.2	3	LUB12 or LUB32	LUCL05●●	1.25...5
	5.5	5.5	9	LUB12 or LUB32	LUCL12●●	3...12
	7.5	9	15	LUB32	LUCL18●●	4.5...18
	15	15	18.5	LUB32	LUCL32●●	8...32

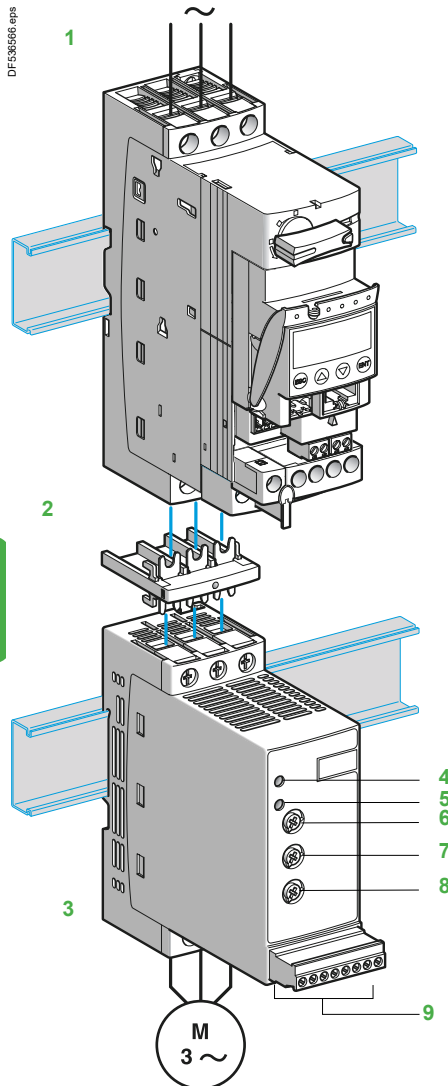
Operating characteristics						
Control units	Standard					Multifunction
	LUCA	LUCB	LUCC	LUCD	LUCL	LUCM
Thermal overload protection						
Over current protection	14.2 x the setting current					3 to 17 x the setting current
Short-circuit protection	13 x I <sub>r</sub> max (max current setting)					
Protection against phase loss						
Protection against phase imbalance						
Earth fault protection (equipment protection only)						
Tripping class	10		10	20		5...30
Motor type	3-phase		Single-phase	3-phase	Single-phase and 3-phase	
Thermal overload test function						
Overtorque						
No-load running						
Long starting time						
Reset method	Manual					Parameters can be set
	Automatic or remote	With function module, or parameters can be set via the bus with a communication module (see page 24614/2).				Parameters can be set
						Parameters can be set via the bus with a communication module (see page 24614/2).

 Integrated function

 Function provided with accessory

Compatibility			
Compatibility of control unit LUCL●● with		References	Functions
The controller	No	LUTM	Controller (without thermal overload protection)
Add-on contact blocks with fault signalling and auxiliary contacts	Yes	LUA1C11 LUA1C20 LUFN20 LUFN11 LUFN02	Add-on contact blocks with fault signalling (1 N/O + 1 N/C) Add-on contact blocks with fault signalling (2 N/O) Auxiliary contacts (2 N/O) Auxiliary contacts (1 N/O + 1 N/C) Auxiliary contacts (2 N/C)
Communication modules	Yes	ASILUFC5 and ASILUFC51 LUF00 LULC07 LULC08 LULC09 LULC15 LULC033	AS-Interface communication modules Parallel wiring module Profibus DP communication module (1 output/2 inputs) CANopen communication module (1 output/2 inputs) DeviceNet communication module (1 output/2 inputs) Advantys STB communication module (1 output/2 inputs) Modbus communication module (1 output/2 inputs)
Function modules	No	LUFW10 LUFDH11 LUFDA01 LUFDA10 LUFV2	Alarm function module Thermal overload signalling module with manual reset Thermal overload signalling module with automatic or remote reset (1 N/C) Thermal overload signalling module with automatic or remote reset (1 N/O) Motor load indication module





### Introduction

The Altistart U01 is a soft start/soft stop unit for asynchronous motors. It is designed primarily for combinations with TeSys U controller-starters.

When combined with a TeSys U 1 controller by means of a connector 2, the Altistart U01 3 is a power option which provides the "Soft start/soft stop" function. The result is a unique, innovative motor starter.

Using the Altistart U01 starter enhances the starting performance of asynchronous motors by allowing them to start gradually, smoothly and in a controlled manner. It prevents mechanical shocks, which lead to wear and tear, and limits the amount of maintenance work and production downtime.

The Altistart U01 limits the starting torque and current peaks on starting, on machines which do not require a high starting torque.

The Altistart U01 is designed for the following simple applications:

- Conveyors
- Conveyor belts
- Pumps
- Fans
- Compressors
- Automatic doors and gates
- Small cranes
- Belt-driven machines, etc.

The Altistart U01 is compact and easy to install. It complies with standards IEC/EN 60947-4-2, carries UL, CSA, C-Tick, CCC certifications and CE marking.

#### ■ ATSU01N2●●LT soft start/soft stop units

- Control two phases of the motor power supply to limit the starting current and for deceleration
- Internal bypass relay
- Motor power ratings ranging from 0.75 kW to 15 kW
- Motor supply voltages ranging from 200 V to 480 V, 50/60 Hz.

An external power supply is required for controlling the starter.

### Description

■ Altistart U01 soft start/soft stop units are equipped with:

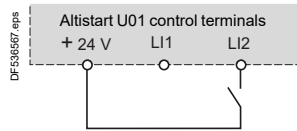
- A potentiometer for setting the starting time 6
- A potentiometer for setting the deceleration time 8
- A potentiometer for adjusting the start voltage threshold according to the motor load 7
- 1 green LED 4 to indicate that the unit is switched on
- 1 yellow LED 5 to indicate that the motor is powered at nominal voltage, if it is connected to the starter
- A connector 9:
  - 2 logic inputs for Run/Stop commands
  - 1 logic input for the BOOST function
  - 1 logic output to indicate the end of starting
  - 1 relay output to indicate the starter has a power supply fault or the motor has reached a standstill at the end of the deceleration stage



#### ATSU01N2●●●LT soft start unit functions

##### ■ 2-wire control

The run and stop commands are controlled by a single logic input. State 1 of logic input LI2 controls starting and state 0 controls stopping.



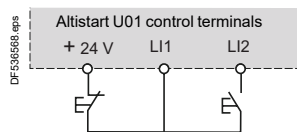
Wiring diagram for 2-wire control

##### ■ 3-wire control

The run and stop commands are controlled by 2 different logic inputs.

Stopping is achieved when logic input LI1 opens (state 0).

The pulse on input LI2 is stored until input LI1 opens.



Wiring diagram for 3-wire control

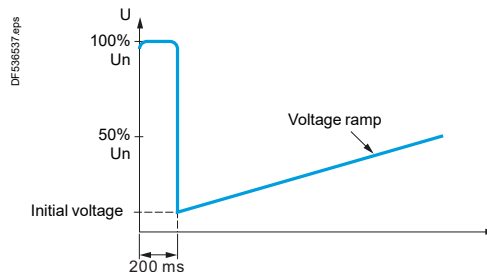
##### ■ Starting time

Controlling the starting time means that the time of the voltage ramp applied to the motor can be adjusted to obtain a gradual starting time, dependent on the motor load.

##### ■ Voltage boost function via logic input

Activating the BOOST logic input enables the function for supplying a starting overtorque capable of overcoming any mechanical friction.

When the input is at state 1, the function is active (input connected to the + 24 V) and the starter applies a fixed voltage to the motor for a limited time before starting.



Application of a voltage boost equal to 100% of the nominal motor voltage

##### ■ End of starting

- application function for logic output LO1

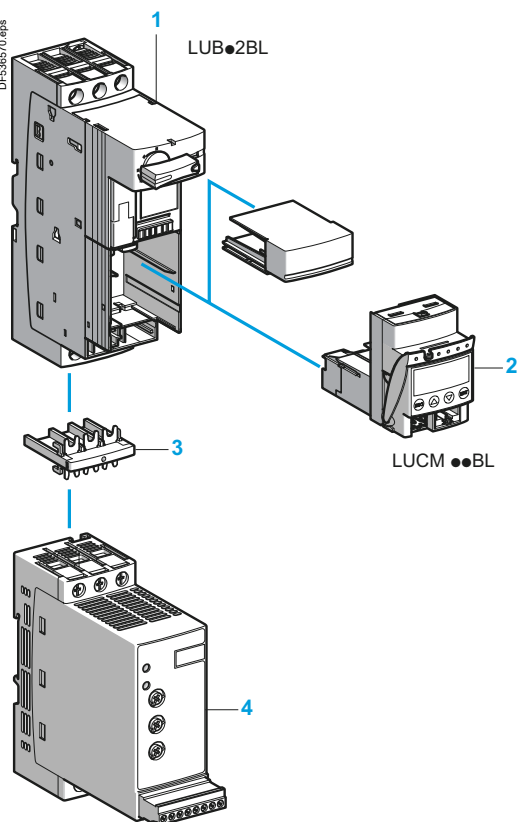
ATSU01N2●●●LT soft start/soft stop units are equipped with an open collector logic output LO, which indicates the end of starting when the motor has reached nominal speed.





ATSU01N222LT

TeSys U



ATSU 01N2●●LT

### Soft start/soft stop units for 0.75 to 15 kW motors (can be combined with the TeSys U starter)

Motor				Starter	
Motor power <sup>(1)</sup>				Nominal current	Reference
230 V	230 V	400 V	460 V	A	
kW	HP	kW	HP		
3-phase supply voltage: 200...480 V 50/60 Hz					
0.75	1	1.5	2	6	ATSU01N206LT
1.1	1.5	2.2	3		
		3			
1.5	2	—	5	9	ATSU01N209LT
—	—	4	—		
2.2	3	5.5	7.5	12	ATSU01N212LT
3	—	—	—		
4	5	7.5	10	22	ATSU01N222LT
5.5	7.5	11	15		
7.5	10	15	20	32	ATSU01N232LT

### Accessories

Description	Used for starter	Reference
Power connector between ATSU01N2●●LT and TeSys U	ATSU01N2●●LT	VW3G4104

### TeSys U starter and soft start unit combinations

Numerous possibilities for combinations and options are offered.  
Please consult the "TeSys U Starters-open version" specialist catalogue.

Motor power			Soft starter	TeSys U	
230 V	400 V	460 V		Power base	Control unit <sup>(2)</sup>
Voltage	kW	HP			
0.75/1	1.5	2	ATSU01N206LT	LUB12	LUC●05BL
1.1/1.5	2.2/3	3	ATSU01N206LT	LUB12	LUC●12BL
1.5/2	—	—	ATSU01N209LT	LUB12	LUC●12BL
—	4	5	ATSU01N209LT	LUB12	LUC●12BL
2.2/3	—	—	ATSU01N212LT	LUB12	LUC●12BL
3/—	5.5	7.5	ATSU01N212LT	LUB32	LUC●18BL
4/5	7.5	10	ATSU01N222LT	LUB32	LUC●18BL
5.5/7.5	11	15	ATSU01N222LT	LUB32	LUC●32BL
7.5/10	15	20	ATSU01N232LT	LUB32	LUC●32BL

Example of a starter-motor combination with:

- 1 non-reversing power base for DOL starting (LUB●2BL)
- 2 control unit (LUCM●●BL)
- 3 power connector (VW3G4104)
- 4 Altistart U01 soft start/soft stop unit (ATSU01N2●●LT)

<sup>(1)</sup> Standard motor power ratings, HP power ratings indicated according to standard UL508.

<sup>(2)</sup> Depending on the configuration of the chosen TeSys U starter, replace the ● with A for standard, B for expandable, and M for multifunction.





#### Coordination

The standard defines tests at different levels of current; the purpose of these tests is to place the equipment in extreme conditions.

The standard defines 2 types of coordination, according to the condition of the components after testing: type 1 and type 2.

Type 1 coordination requires that in a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and must not be able to resume operation without repair or the replacement of parts.

**The product combinations given below provide type 1 coordination**

#### Soft start-soft stop unit/TeSys U starter controller combination with magnetic protection

##### TeSys U / Altistart 48: type 1 coordination

Power 400 V (kW)	TeSys U references (protection + power switching)	Soft start unit reference	
		Class 10	Class 20
5.5	LUB32 + LUCL32 or LUCL18	–	ATS48D17
7.5	LUB32 + LUCL32	ATS48D17	ATS48D22
11	LUB32 + LUCL32	ATS48D22	ATS48D32
15	LUB32 + LUCL32	ATS48D32	ATS48D38

#### Variable speed controller/TeSys U starter controller combination with magnetic protection

##### TeSys U / Altivar 21 UL Type 1/IP 20: type 1 coordination

Power 400 V (kW)	TeSys U references (protection + power switching)	Variable speed controller reference	
		Class 10	Class 20
0.75	LUB12 + LUCL05	ATV21H075N4	ATV21HU15N4
2.2	LUB12 + LUCL12	ATV21HU22N4	
3	LUB12 + LUCL12	ATV21HU30N4	
4	LUB12 + LUCL12	ATV21HU40N4	
5.5	LUB32 + LUCL32 or LUCL18	ATV21HU55N4	
7.5	LUB32 + LUCL32 or LUCL18	ATV21HU75N4	
11	LUB32 + LUCL32	ATV21HD11N4	
15	LUB32 + LUCL32	ATV21HD15N4	

##### TeSys U / Altivar 21 IP 54: type 1 coordination

Power 400 V (kW)	TeSys U references (protection + power switching)	Variable speed controller reference	
		Class 10	Class 20
0.75	LUB12 + LUCL05	ATV21W075N4/N4C	
1.5	LUB12 + LUCL12 or LUCL05	ATV21WU15N4/N4C	
2.2	LUB12 + LUCL12	ATV21WU22N4/N4C	
3	LUB12 + LUCL12	ATV21WU30N4/N4C	
4	LUB12 + LUCL12	ATV21WU40N4/N4C	
5.5	LUB32 + LUCL32 or LUCL18	ATV21WU55N4/N4C	
7.5	LUB32 + LUCL32 or LUCL18	ATV21WU75N4/N4C	
11	LUB32 + LUCL32	ATV21WD11N4/N4C	
15	LUB32 + LUCL32	ATV21WD15N4/N4C	





+



+



+

#### Variable speed controller/TeSys U starter controller combination with magnetic protection (continued)

##### TeSys U / Altivar 31: type 1 coordination

Power 400 V (kW)	TeSys U references (protection + power switching)	Variable speed controller reference
0.37	LUB12 + LUCL05	ATV31H037N4
0.55	LUB12 + LUCL05	ATV31H055N4
0.75	LUB12 + LUCL05	ATV31H075N4
1.1	LUB12 + LUCL12	ATV31HU11N4
1.5	LUB12 + LUCL12	ATV31HU15N4
2.2	LUB12 + LUCL12	ATV31HU22N4
3	LUB32 + LUCL18	ATV31HU30N4
4	LUB32 + LUCL18	ATV31HU40N4
5.5	LUB32 + LUCL32	ATV31HU55N4
7.5	LUB32 + LUCL32	ATV31HU75N4

##### TeSys U / Altivar 61: type 1 coordination

Power 400V (kW)	TeSys U references (protection + power switching)	Variable speed controller reference
0.75	LUB12 + LUCL05	ATV61H075N4
1.5	LUB12 + LUCL12	ATV61HU15N4
2.2	LUB12 + LUCL12	ATV61HU22N4
3	LUB32 + LUCL18	ATV61HU30N4
4	LUB32 + LUCL18	ATV61HU40N4
5.5	LUB32 + LUCL32	ATV61HU55N4
7.5	LUB32 + LUCL32	ATV61HU75N4

##### TeSys U / Altivar 71: type 1 coordination

Power 400V (kW)	TeSys U references (protection + power switching)	Variable speed controller reference
0.75	LUB12 + LUCL05	ATV71H075N4
1.5	LUB12 + LUCL12	ATV71HU15N4
2.2	LUB12 + LUCL12	ATV71HU22N4
3	LUB32 + LUCL18	ATV71HU30N4
4	LUB32 + LUCL18	ATV71HU40N4
5.5	LUB32 + LUCL32	ATV71HU55N4



# Technical Data for Designers

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Altistart U01 Soft starter .....	A4/75 to A4/81

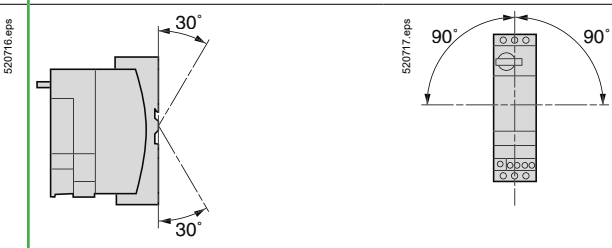


# TeSys

## TeSys U All-in-one motor starters

### Characteristics

#### Environment

Product certifications			UL, CSA, CCC, GOST, ASEAFA. ABS, BV, DNV, GL, LROS. ATEX.
Conforming to standards			IEC/EN 60947-6-2, CSA-22.2 N° 60947-4-1-14 UL 60947-4-1: with phase barrier LU9 SP0
Rated insulation voltage (Ui)	Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution: 3	V	690
	Conforming to UL508, CSA C22-2 n°14	V	600
Rated impulse withstand voltage (Uimp)	Conforming to IEC/EN 60947-6-2	kV	6
Degree of protection Conforming to IEC/EN 60947-1 (protection against direct finger contact)	Front panel outside connection zone		IP 40
	Front panel and wired terminals		IP 20
	Other faces		IP 20
Protective treatment	Conforming to IEC/EN 60068		"TH"
	Conforming to IEC/EN 60068-2-30	Cycles	12
	Conforming to IEC/EN 60068-2-11	h	48
Ambient air temperature around the device	Storage	°C	-40...+85
	Operation	°C	Power bases and standard and advanced control units: -25... +70. (At temperatures above 60 °C and up to 70 °C, for starter-controller LUB32, LUB38, leave a minimum gap of 9 mm between products).  Power bases and multifunction control units: -25...+60. (At temperatures above 45 °C, leave a minimum gap of 9 mm between products. At temperatures above 55 °C and up to 60 °C, leave a gap of 20 mm between products.)
Ref.	Maximum operating altitude	m	2000
	Operating positions	In relation to normal vertical mounting plane	
Flame resistance	Conforming to UL 94		V2
	Conforming to IEC/EN 60695-2-12	°C	960 (parts supporting live components) °C 650
Environmental restrictions			Cadmium and silicone-free, recyclable
Shock resistance 1/2 sine wave = 11 ms	Conforming to IEC/EN 60068-2-27 <sup>(1)</sup>		Power poles open: 10 gn Power poles closed: 15 gn
Vibration resistance 5...300 Hz	Conforming to IEC/EN 60068-2-6 <sup>(1)</sup>		Power poles open: 2 gn Power poles closed: 4 gn <sup>(2)</sup>
Resistance to electrostatic discharge	Conforming to IEC/EN 61000-4-2	kV	In open air: 8 - Level 3
		kV	On contact: 8 - Level 4
Immunity to radiated high-frequency disturbance	Conforming to IEC/EN 61000-4-3	V/m	10 - Level 3
Immunity to fast transient currents	Conforming to IEC/EN 61000-4-4	kV	All circuits except for serial link: 4 - Level 4
		kV	Serial link: 2 - Level 3
Immunity to dissipated shock waves	Conforming to IEC/EN 60947-6-2		Common mode                      Serial mode
	Uc ~ 24...240 V, Uc --- 48...220 V	kV	2    1
	Uc = 24 V ---		Not applicable
Immunity to conducted high-frequency disturbance	Conforming to IEC/EN 61000-4-6	V	10
Radiated emission and conducted	Conforming to CISPR 11 and EN 55011		Class A

(1) Without modifying the contact states, in the most unfavourable direction.

(2) 2 gn with Advantys STB or CANopen communication modules.



## Power circuit connection characteristics

### Connection to Ø4 mm screw clamp terminals

Power base, control unit or reverser block type			LUB12 + LUCA or LUCB or LUCC or LUCD	LUB32/LUB38 + LUCA or LUCB or LUCC or LUCD	LUB12 + LUCM	LUB32 + LUCM	LU2B LU2M LU6M
Flexible cable without cable end	1 conductor	mm <sup>2</sup>	2.5...10	2.5...10	2.5...10	2.5...10	2.5...10
	2 conductors	mm <sup>2</sup>	1.5...6	1.5...6	1.5...6	1.5...6	1.5...6
Flexible cable with cable end	1 conductor	mm <sup>2</sup>	1...6	1...6	1...6	1...6	1...6
	2 conductors	mm <sup>2</sup>	1...6	1...6	1...6	1...6	1...6
Solid cable without cable end	1 conductor	mm <sup>2</sup>	1...10	1...10	1...10	1...10	1...10
	2 conductors	mm <sup>2</sup>	1...6	1...6	1...6	1...6	1...6
Screwdriver			Philips n° 2 or flat screwdriver: Ø6 mm				
Tightening torque			N.m	1.9...2.5	1.9...2.5	1.9...2.5	1.9...2.5

## Control circuit connection characteristics

### Connection to Ø3 mm screw clamp terminals

Flexible cable without cable end	1 conductor	mm <sup>2</sup>	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5
	2 conductors	mm <sup>2</sup>	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5
Flexible cable with cable end	1 conductor	mm <sup>2</sup>	0.34...1.5	0.34...1.5	0.34...1.5	0.34...1.5	0.34...1.5
	2 conductors	mm <sup>2</sup>	0.34...1.5	0.34...1.5	0.34...1.5	0.34...1.5	0.34...1.5
Solid cable without cable end	1 conductor	mm <sup>2</sup>	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5
	2 conductors	mm <sup>2</sup>	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5
Screwdriver			Philips n° 1 or flat screwdriver: Ø5 mm				
Tightening torque			N.m	0.8...1.2	0.8...1.2	0.8...1.2	0.8...1.2

## Control circuit characteristics

Rated voltage of control circuit	~ 50/60 Hz	V	24...240	24...240	—	—	—
	—	V	24...220	24...220	24	24	—
Voltage limits	— 24 V <sup>(1)</sup>	V	20...27	20...27	20...28	20...28	—
	Operation	V	20...26.5	20...26.5	—	—	—
Drop-out	~ or — 48...72 V	V	~ 38.5...72, — 38.5...93	—	—	—	—
	~ 110...240 V	V	~ 88...264	~ 88...264	—	—	—
	— 110...220 V	V	— 88...242	— 88...242	—	—	—
	— 24 V	V	14.5	14.5	14.5	14.5	—
	~ 24 V	V	14.5	14.5	—	—	—
	~ or — 48...72 V	V	29	29	—	—	—
Typical consumption I max while closing	~ 110...240 V, — 110...220 V	V	55	55	—	—	—
	— 24 V	mA	130	220	150	200	120
	~ 24 V	mA	140	220	—	—	2360
	~ or — 48...72 V	mA	280	280	—	—	2300
	~ 110...240 V, — 110...220 V	mA	280	280	—	—	1000
	I rms sealed	mA	60	80	70	75	120
Heat dissipation	~ 24 V	mA	70	90	—	—	<sup>(2)</sup>
	~ or — 48...72 V	mA	35	45	—	—	<sup>(2)</sup>
	~ 110...240 V, — 110...220 V	mA	35	25	—	—	<sup>(2)</sup>
		W	2	3	1.7	1.8	—
Operating time	Closing	ms	24 V: 70; 48 V: 60; ≥ 72 V: 50		75	65	—
	Opening	ms	35	35	35	35	—
Resistance to micro-breaks			ms	3	3	3	—
Resistance to voltage dips			IEC/EN 61000-4-11				
Mechanical durability			In millions of operating cycles				
Maximum operating rate			In operating cycles per hour				

## Main pole characteristics

Number of poles			3	3	3	3	—
Isolation conforming to IEC/EN 60947-1	Possible		Yes	Yes	Yes	Yes	—
	Padlocking		1 padlock with Ø6.9 mm shank				
Rated thermal current		A	12	32/38	12	32	—
Rated operational current (U <sub>e</sub> ≤ 440V)	To IEC/ Category AC-41		θ ≤ 70°C: 12 A	θ ≤ 70°C: 32/38 A	θ ≤ 55°C: 12 A	θ ≤ 55°C: 32 A	—
	EN 60947-6-2 Category AC-43		θ ≤ 70°C: 12 A	θ ≤ 70°C: 32/38 A	θ ≤ 55°C: 12 A	θ ≤ 55°C: 32 A	—
Rated operational voltage		V	690 <sup>(3)</sup>	690 <sup>(3)</sup>	690 <sup>(3)</sup>	690 <sup>(3)</sup>	—
Frequency limits		Hz	40...60	40...60	40...60	40...60	—
Power dissipated in the power circuits	Operational current	A	3 6 9 12	18 25 32 38			—
	Power dissipated in all three poles	W	0.1 0.3 0.6 1.1	2.4 4.6 7.5 10.6			—
Rated breaking capacity on short-circuit		V	230 440 500 690				—
		kA	50 50 (25 for LUB38) 10 4				—
Total breaking time		ms	2 2 2				—
Thermal limit		With I <sub>sc</sub> max on 440 V	kA <sup>2</sup> s	90 120	90 120		—

<sup>(1)</sup> Voltage with maximum ripple of ±10 %.

<sup>(2)</sup> No consumption sealed.

<sup>(3)</sup> For 690 V, use phase barrier LU9SP0.

References:  
pages A4/10 to A4/14

Curves:  
pages A4/54 to A4/59

Dimensions:  
pages A4/60 and A4/61

Schemes:  
pages A4/62 to A4/74



# TeSys

## TeSys U All-in-one motor starters

### Characteristics

#### Specific characteristics of power bases LU2B and reverser blocks LU2M or LU6M

Duration of inrush phase	~ 50/60 Hz	<b>ms</b>	25
	---	<b>ms</b>	15
Maximum operating time	Without change of direction	<b>ms</b>	75
	With change of direction	<b>ms</b>	150

#### General characteristics of auxiliary contacts

Conventional thermal current (I <sub>th</sub> )	For ambient temperature $\theta < 70\text{ }^{\circ}\text{C}$	<b>A</b>	5
Frequency of the operational current		<b>Hz</b>	Up to 400
Minimum switching capacity $\lambda = 10^{-8}$	U min	<b>V</b>	17
	I min	<b>mA</b>	5
Short-circuit protection	Conforming to IEC/EN 60947-5-1	<b>A</b>	gG fuse: 4
Short-time rating	Permissible for	1 s	<b>A</b> 30
		500 ms	<b>A</b> 40
		100 ms	<b>A</b> 50
Insulation resistance		<b>mΩ</b>	10
Non-overlap time	Guaranteed between N/C and N/O contacts	<b>ms</b>	2 (on energisation and on de-energisation)

#### Specific characteristics of auxiliary contacts built-into the power base

Linked contacts	Conforming to IEC/EN 60947-4-1		Each power base has 1 N/O contact and 1 N/C contact which are mechanically linked
Mirror contact	Conforming to IEC/EN 60947-1		The N/C contact fitted in each power base reliably represents the state of the power contacts (safety scheme)
Rated operational voltage (U <sub>e</sub> )		<b>V</b>	Up to ~ 690; --- 250
Rated insulation voltage (U <sub>i</sub> )	Conforming to IEC/EN 60947-5-1	<b>V</b>	690
	Conforming to UL, CSA	<b>V</b>	600

#### Specific characteristics of auxiliary contacts in modules LUFN, of auxiliary contacts LUA1 and of reverser blocks LU2M and LU6M

Rated operational voltage (U <sub>e</sub> )		<b>V</b>	Up to ~ 250; --- 250
Rated insulation voltage (U <sub>i</sub> )	Conforming to IEC/EN 60947-5-1	<b>V</b>	250
	Conforming to UL, CSA	<b>V</b>	250

#### Rated operational power of contacts

Conforming to IEC/EN 60947-5-1

#### a.c. supply, categories AC-14 and AC-15

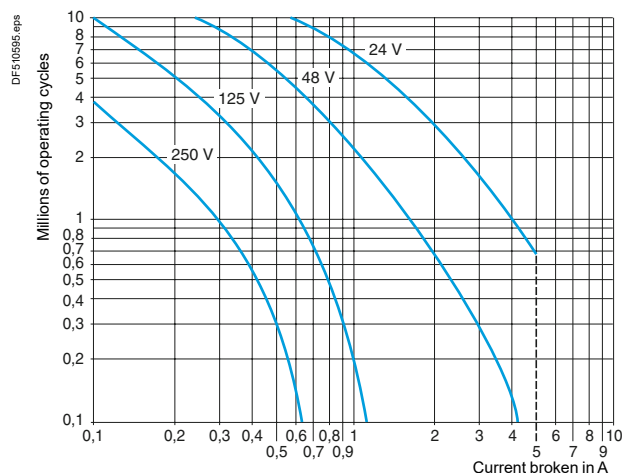
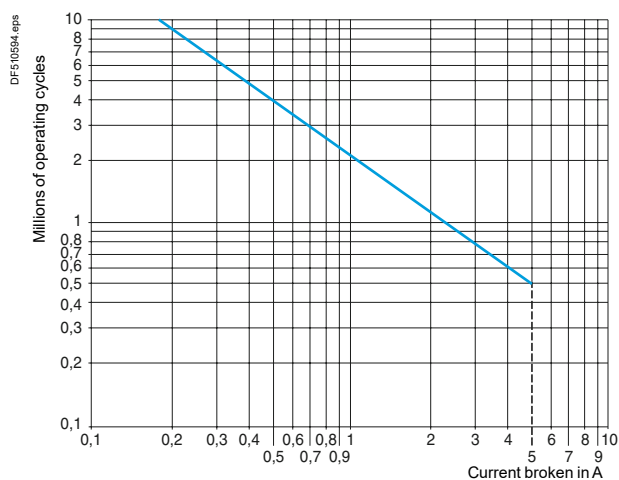
Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current ( $\cos \varphi 0.7$ ) = 10 times the power broken ( $\cos \varphi = 0.4$ )

	V	24	48	115	230	400	440	690
1 million operating cycles	VA	60	120	280	560	960	1050	1440
3 million operating cycles	VA	16	32	80	160	280	300	420
10 million operating cycles	VA	4	8	20	40	70	80	100

#### d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

V	24	48	125	250
W	120	90	75	68
W	70	50	38	33
W	25	18	14	12





## Characteristics of standard control units LUCA

Protection	Motor type		3-phase
	Conforming to standard		IEC/EN 60947-6-2, UL 60947-4-1, CSA C22-2 n°14
Overload protection	Tripping class conforming to UL 508, IEC/EN 60947-6-2		10
	Frequency limits of the operational current	Hz	40...60
	Temperature compensation	°C	-25...+70
	Protection against phase imbalance		Yes
Short-circuit protection	Tripping threshold		13 x I <sub>r</sub> max (max current setting)
	Tripping tolerance		±20 %

## Characteristics of advanced control units LUCB, LUCC and LUCD

Control unit type		LUCB	LUCC	LUCD
Protection	Motor type	3-phase	Single-phase	3-phase
	Conforming to standard	IEC/EN 60947-6-2, CSA C22-2 n°14	IEC/EN 60947-6-2, CSA C22-2 n°14	IEC/EN 60947-6-2, CSA C22-2 n°14
Overload protection	Tripping class conforming to UL 508, IEC/EN 60947-6-2	10	10	20
	Frequency limits of the operational current	Hz	40...60	40...60
	Temperature compensation	°C	-25...+70	-25...+70
	Protection against phase imbalance	Yes	—	Yes
Short-circuit protection	Tripping threshold	13 x I <sub>r</sub> max.	13 x I <sub>r</sub> max.	13 x I <sub>r</sub> max.
	Tripping tolerance	±20 %	±20 %	±20 %

## Characteristics of multifunction control units LUCM

Protection	Motor type		Parameters can be set: single-phase or 3-phase	
	Conforming to standard		IEC/EN 60947-6-2	
Overload protection	Tripping class conforming to IEC/EN 60947-6-2		5, 10, 15, 20, 25, 30 (selectable)	
	Frequency limits of the operational current	Hz	50...60	
	Temperature compensation	°C	-25...+55	
Communication interface for terminal on enclosure door	Physical interface		RS 485 multi-drop	
	Connections		RJ45 on front panel	
	Protocol		Modbus RTU	
	Maximum transmission speed	bit/s	19 200 (self-configuration up to this value)	
	Maximum return time	ms	200	
Display	Type		LCD, 2 lines of 12 characters	
	Language version		Multilanguage (English, French, German, Italian, Spanish)	
	Precision		±5 %	
	Resolution		1 % of I <sub>r</sub>	
Auxiliary supply	External type	V	--- 24, with maximum ripple of ±10 %.	
	Heat dissipation	W	0.8	

## Configuration table for protection devices and alarms on multifunction control units LUCM

	Tripping	Alarm	Adjustment of tripping threshold		Adjustment of time before tripping		Adjustment of alarm threshold	
	Factory setting	Factory setting	Range	Default value	Range	Default value	Range	Default value
Overcurrent	Activated <sup>(1)</sup>	—	3...17 I <sub>r</sub>	14.2	—	—	—	—
Overload	Activated <sup>(1)</sup>	Activated	0.5...32 A <sup>(2)</sup>	I <sub>r</sub> min	Class: 5...30	5	10...100 % of the thermal state	85 %
Earth fault	Activated	Activated	0.2...5 I <sub>r</sub> min	0.3 I <sub>r</sub> min	0.1...1.2 s	0.1 s	0.2...5 I <sub>r</sub> min	0.3 I <sub>r</sub> min
Phase imbalance	Activated	Activated	10...30 %	10 %	0.2...20 s	5 s	10...30 %	10 %
Torque limitation	Deactivated	Deactivated	1...8 I <sub>r</sub>	2 I <sub>r</sub>	1...30 s	5 s	1...8 I <sub>r</sub>	2 I <sub>r</sub>
No-load running	Deactivated	Deactivated	0.3...1 I <sub>r</sub>	0.5 I <sub>r</sub>	1...200 s	10 s	0.3...1 I <sub>r</sub>	0.5 I <sub>r</sub>
Long starting time	Deactivated	Deactivated	1...8 I <sub>r</sub>	I <sub>r</sub>	1...200 s	10 s	1...8 I <sub>r</sub>	I <sub>r</sub>

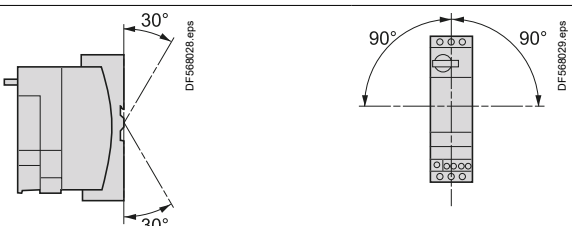
## Configuration of additional functions on multifunction control units LUCM

	Factory setting	Setting range
Reset	Manual	Manual, automatic or remote
Time before reset	120 s	1...1000 s
Type of load	3-phase motor	3-phase motor, single-phase motor
	Self-cooled	Self-cooled, force cooled
Language	English	English, French, German, Italian, Spanish
Display	Average current	Average current, thermal state of motor, current in phase 1 / 2 / 3, earth leakage current, phase imbalance, cause of last 5 faults

(1) This function cannot be deactivated.

(2) The setting range depends on the rating of the control unit used.



Characteristics of magnetic control unit LUCL			
Protection	Motor type		3-phase
	Conforming to standard		When used in conjunction with an LUB12, LUB32 or LUB38 power base, magnetic control unit LUCL conforms to standard IEC 60947-6-2.
Short-circuit protection	Tripping threshold		14.2 x I <sub>n</sub> (max. setting current)
	Tripping tolerance		±20 %
<b>Environment</b>			
Product certifications			CE
Conforming to standards			When used in conjunction an LUB power base, control unit LUCL conforms to standard 60947-6-2.
Rated insulation voltage (U <sub>i</sub> )	Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution: 3	V	690
Rated impulse withstand voltage (U <sub>imp</sub> )	Conforming to IEC/EN 60947-6-2	kV	6
Safety separation of circuits SELV	Conforming to IEC/EN 60947-1 appendix N	V	Between the control or auxiliary circuit and the main circuit: 400 Between the control and auxiliary circuits: 40
Degree of protection (protection against direct finger contact)	Front panel outside connection zone		IP 40
	Front panel and wired terminals		IP 20
	Other faces		IP 20
Protective treatment	Conforming to IEC/EN 60068		"TH"
	Conforming to IEC/EN 60068-2-30	Cycles	12
	Conforming to IEC/EN 60068-2-11	h	48
Ambient air temperature around the device	Storage	°C	- 40... + 85
	Operation	°C	Power bases and standard and advanced control units: - 25... + 70. (At temperatures above 60 °C and up to 70 °C, for I <sub>e</sub> = 32 A, leave a minimum gap of 9 mm between products).  Power bases and multifunction control units: - 25... + 60. (At temperatures above 45 °C, leave a minimum gap of 9 mm between products. At temperatures above 55 °C up to 60 °C, leave a gap of 20 mm between products.)
Maximum operating altitude		m	2000
Operating positions	In relation to normal vertical mounting plane		
Flame resistance	Conforming to UL 94		V2
	Conforming to IEC/EN 60695-2-12	°C	960 (parts supporting live components) °C 650
Environmental restrictions			Cadmium and silicone-free, recyclable
Shock resistance 1/2 sine wave = 11 ms	Conforming to IEC/EN 60068-2-27 <sup>(1)</sup>		Power poles open: 10 gn Power poles closed: 15 gn
Vibration resistance 5...300 Hz	Conforming to IEC/EN 60068-2-6 <sup>(1)</sup>		Power poles open: 2 gn Power poles closed: 4 gn <sup>(2)</sup>
Resistance to electrostatic discharge	Conforming to IEC/EN 61000-4-2	kV	In open air: 8 - Level 3
		kV	On contact: 8 - Level 4
Immunity to radiated high-frequency disturbance	Conforming to IEC/EN 61000-4-3	V/m	10 - Level 3
Immunity to fast transient currents	Conforming to IEC/EN 61000-4-4	kV	All circuits except for serial link: 4 - Level 4
		kV	Serial link: 2 - Level 3
Immunity to dissipated shock waves	Conforming to IEC/EN 60947-6-2		<b>Common mode</b>
	U <sub>c</sub> ~ 24...240 V, U <sub>c</sub> --- 48...220 V	kV	2
	U <sub>c</sub> = 24 V ---		Not applicable
Immunity to conducted high-frequency disturbance	Conforming to IEC/EN 61000-4-6	V	10

(1) Without modifying the contact states, in the most unfavourable direction.  
(2) 2 gn with Advantys STB or CANopen communication modules.



Power circuit connection characteristics of LUCL										
Power base and control unit type			LUB12 + LUCL		LUB32 + LUCL	LUB38 + LUCL				
Connection to Ø4 mm screw clamp terminals										
Flexible cable without cable end	1 conductor	mm²	2.5...10		2.5...10					
	2 conductors	mm²	1.5...6		1.5...6					
Flexible cable with cable end	1 conductor	mm²	1...6		1...6					
	2 conductors	mm²	1...6		1...6					
Flexible cable without cable end	1 conductor	mm²	1...10		1...10					
	2 conductors	mm²	1...6		1...6					
Screwdriver			Philips n° 2 or flat screwdriver: Ø6 mm							
Tightening torque			N.m	1.9...2.5		1.9...2.5				
Control circuit connection characteristics of LUCL										
Connection to Ø3 mm screw clamp terminals										
Flexible cable without cable end	1 conductor	mm²	0.75...1.5		0.75...1.5					
	2 conductors	mm²	0.75...1.5		0.75...1.5					
Flexible cable with cable end	1 conductor	mm²	0.34...1.5		0.34...1.5					
	2 conductors	mm²	0.34...1.5		0.34...1.5					
Flexible cable without cable end	1 conductor	mm²	0.75...1.5		0.75...1.5					
	2 conductors	mm²	0.75...1.5		0.75...1.5					
Screwdriver			Philips n° 2 or flat screwdriver: Ø5 mm							
Tightening torque			N.m	0.8...1.2		0.8...1.2				
Control circuit characteristics of LUCL										
Rated control circuit voltage	~ 50/60 Hz	V	24...240		24...240					
	---	V	24...220		24...220					
Voltage limits Operation	--- 24 V <sup>(1)</sup>	V	20...27		20...27					
	~ 24 V	V	20...26.5		20...26.5					
	~ or --- 48...72 V	V	~ 38.5...72, --- 38.5...93		~ 38.5...72, --- 38.5...93					
	~ 110...240 V	V	~ 88...264		~ 88...264					
	--- 110...240 V	V	--- 88...242		--- 88...242					
Drop-out	--- 24 V	V	14.5		14.5					
	~ 24 V	V	14.5		14.5					
	~ or --- 48...72 V	V	29		29					
	~ 110...240 V, --- 110...220 V	V	55		55					
	---	V	55		55					
Typical consumption I max while closing	--- 24 V	mA	130		220					
	~ 24 V	mA	140		220					
	~ or --- 48...72 V	mA	280		280					
	~ 110...240 V, --- 110...220 V	mA	280		280					
	---	mA	280		280					
I rms sealed	--- 24 V	mA	60		80					
	~ 24 V	mA	70		90					
	~ or --- 48...72 V	mA	35		45					
	~ 110...240 V, --- 110...220 V	mA	35		25					
	---	mA	35		25					
Heat dissipation		W	2		3					
Operating time	Closing	ms	24 V: 70; 48 V: 60; ≥ 72 V: 50		24 V: 70; 48 V: 60; ≥ 72 V: 50					
	Opening	ms	35		35					
Resistance to micro-breaks		ms	3		3					
Resistance to voltage dips		IEC/EN 61000-4-11	At least 70 % of U <sub>c</sub> for 500 ms							
Mechanical durability		In millions of operating cycles	15		15					
Maximum operating rate		In operating cycles per hour	3600		3600					
Main pole characteristics of LUCL										
Number of poles			3		3					
Isolation conforming to IEC/EN 60947-1	Possible		Yes		Yes					
	Padlocking		1 padlock with Ø6.9 mm shank		1 padlock with Ø6.9 mm shank					
Rated thermal current		A	12		32	(38 A for LUB38)				
Rated operational current (U <sub>e</sub> ≤ 440 V)	Conforming to IEC/EN 60947-6-2	Category AC-41	θ ≤ 70 °C: 12 A		θ ≤ 70 °C: 32 A	(38 A for LUB38)				
		Category AC-43	θ ≤ 70 °C: 12 A		θ ≤ 70 °C: 32 A	38				
Rated operational voltage		V	690 <sup>(3)</sup>		690 <sup>(3)</sup>	690				
Frequency limits		Hz	40...60		40...60	40...60				
Power dissipated in the power circuits	Operational current	A	3	6	9	12	18	25	32	38
	Power dissipated in all three poles	W	0.1	0.3	0.6	1.1	2.4	4.6	7.5	10.5
Rated breaking capacity on short-circuit		V	230		440		500		690	
		kA	50		50		10		4	
Total breaking time		ms	2		2		2			
Thermal limit		With I <sub>sc</sub> max on 440 V	kA²s	90						120

<sup>(1)</sup> d.c. voltage with maximum ripple of ± 10 %.

<sup>(2)</sup> No consumption sealed.

<sup>(3)</sup> For 690 V, use phase barrier LUGSP0.

(1) d.c. voltage with maximum ripple of ± 10 %.

(2) No consumption sealed.

(3) For 690 V, use phase barrier LU9SP0.



## Characteristics of limiter-disconnector LUALB1

Rated insulation voltage (Ui) conforming to standard IEC/EN 60947-1	V	690
Conventional thermal current (Ith) conforming to standard IEC/EN 60947-1	A	32
Operating threshold	I rms	kA 50
Breaking capacity	V	440 690
	kA	130 70
Mounting		Directly on the upstream terminals of the starter-controller
Cabling		
Solid cable	1 conductor	mm <sup>2</sup> 1.5...10
	2 conductors	mm <sup>2</sup> 1.5...6
Flexible cable without cable end	1 conductor	mm <sup>2</sup> 1...10
	2 conductors	mm <sup>2</sup> 1...6
Flexible cable with cable end	1 conductor	mm <sup>2</sup> 1...6
	2 conductors	mm <sup>2</sup> 1...6
Screwdriver		Phillips n°2 or flat screwdriver Ø6 mm
Tightening torque	N.m	1.9...2.5

## Characteristics of current limiter LA9LB920

Rated insulation voltage (Ui) conforming to standard IEC/EN 60947-1	V	690
Conventional thermal current (Ith) conforming to standard IEC/EN 60947-1	A	63
Operating threshold	I rms	A 1000
Breaking capacity	V	440 690
	kA	100 35
Mounting		Separate
Cabling		
Solid cable	1 conductor	mm <sup>2</sup> 1.5...25
	2 conductors	mm <sup>2</sup> 1.5...10
Flexible cable without cable end	1 conductor	mm <sup>2</sup> 1.5...25
	2 conductors	mm <sup>2</sup> 2.5...10
Flexible cable with cable end	1 conductor	mm <sup>2</sup> 1.5...16
	2 conductors	mm <sup>2</sup> 1.5...4
Screwdriver		Phillips n°2 or flat screwdriver Ø6 mm
Tightening torque	N.m	2.2

## Characteristics of thermal overload alarm function modules LUFW10

Activation threshold		Fixed at 88 % of the thermal tripping state
Hysteresis between activation and switching off		5 %
Display		By LED on front panel
Supply		Powered by the control unit
Discrete output characteristics	Type	N/O contact
	AC-15	230 V max; 400 VA 100 000 operating cycles
	DC-13	24 V; 50 W 100 000 operating cycles
Conventional thermal current (Ith)	For ambient temperature $\theta < 70\text{ }^{\circ}\text{C}$	A 2
Short-circuit protection	Conforming to IEC/EN 60947-5-1	A gG fuse: 2

## Characteristics of thermal overload fault signalling and reset modules

Module type		LUFDH11	LUFDA01	LUFDA10
Fault signalling		By LED on front panel		
External power supply	V	~/~ 24... 240		
Module consumption	mA	7 at ~ 24 1.1 at ~ 240		
Discrete outputs	Type	1 N/C+ 1 N/O	1 N/C	1 N/O
	AC-15	230 V max; 400 VA 100 000 operating cycles		
	DC-13	24 V; 50 W 100 000 operating cycles		
Conventional thermal current (Ith)	For ambient temperature $\theta < 70\text{ }^{\circ}\text{C}$	A 2		
Short-circuit protection	Conforming to IEC/EN 60947-5-1	A gG fuse: 2		
Reset input	Conductor c.s.a.	mm <sup>2</sup> 0.2 min		
	Length	m 500 (R = 50 $\Omega$ , L = 52.8 mH, Cp = 93 pF)		





Characteristics of motor load indication function module LUFV2				
Analogue output			4 - 20 mA	
Signal delivered			Value of I average/I <sub>r</sub> ratio within the range of 0 to 2 for LUCB and LUCD Value of I average/I <sub>r</sub> ratio within the range of 0 to 3 for LUCC	
Load impedance	Minimum	kΩ	–	
	Maximum	Ω	500	
	Typical	Ω	100	
Signal characteristics with advanced control unit	Precision		±6 %	
Signal characteristics with multifunction control unit	Precision		±10 %	
	Resolution		1 % of I <sub>r</sub>	
Supply			External 24 V	

Characteristics of AS-Interface communication modules ASILUFC5 and ASILUFC51				
Module type			ASILUF C5	ASILUF C51
Product certification			AS-Interface V2.1 n° 52901	AS-Interface V2.1 n° 52303
AS-Interface profile			7.D.F.0	7.A.7.E
Ambient air temperature		°C	Operation -25...+70	
Cycle time		ms	5	10
Addressing			31 slaves	62 slaves
AS-Interface supply		V	29.5...31.5	
Current consumption	On the AS-Interface bus	mA	Normal operation: 25	
		mA	Fault condition: 30	
	On 24 V supply for the outputs	mA	200	
Auxiliary supply		V	24 ±30 %	
Number of outputs			2 dedicated to starter-controller coil operation	
Switching capacity of the solid state outputs			0.5 A/24 V (outputs protected against short-circuits)	
Indication/diagnostics			By 2 LEDs on front panel	

Characteristics of Modbus communication module LULC033				
Physical interface			RS 485 multi-drop	
Connections			RJ45 on front panel	
Protocol			Modbus RTU	
Maximum transmission speed		bit/s	19 200 (self-configuration up to this value)	
Maximum return time		ms	30	
Addressing			By switches: from 0...31	
Ambient air temperature		°C	Operation -25...+55	
Discrete inputs	Number		2 (to be assigned according to the configuration)	
	Supply	V	24	
	Input current	mA	7	
Nominal input values	Voltage	V	24 (positive logic)	
	Current	mA	7	
Response time	Change to state 1	ms	10 (±30 %)	
	Change to state 0	ms	10 (±30 %)	
Input type			Resistive	
Solid state outputs	Number		3, of which 2 dedicated to starter-controller coil operation	
	Supply	V	24	
	Max. current	mA	500	
Protection	gl fuse	A	1	
Switching capacity			0.5 A/24 V	
Indication/diagnostics			By 3 LEDs on front panel	



## Characteristics of CANopen, Profibus DP and DeviceNet communication modules

Communication module				Profibus DP LULC07	CANopen LULC08	DeviceNet LULC09
Services	Conformity class			NA	S 20 (Schneider Electric)	NA
	Standard			Profibus DP	CIADS-301 V4.02 DR 303-2	IEC 62026-1, overvoltage category III, degree of pollution: 3
	Profile			LVSG V1.0 MS (Motor Starter) and MMS (Motor Management Starter)	–	ODVA (Open DeviceNet Vendor Association) MS (Motor Starter)
	Protocol			Profibus DP	CAN 2.0A (2B passive)	CAN 2.0A (2B passive)
	Address			1...125	0...127 (by switches)	0...63
Structure	Physical interface			9-way SUB-D male	9-way SUB-D female	“Open Style” connector
	Binary rate			9600 Kbits/s...12 Mbits/s	10, 20, 50, 125, 250, 500 and 1000 Kbits/s (by switches)	125...500 kbaud
	Cables			2 shielded twisted pairs		
Supply for the discrete outputs and control	⎓ 24 V		V	20...28		
	Current consumption		A	1.5 (max)		
	Protection by gl fuse		A	2		
Ambient air temperature			°C	Operation -25...+55		
Logic inputs	Number			2 (to be assigned according to the configuration)		
	Supply		V	⎓ 24		
	Input current		mA	7		
	Nominal input values	Voltage	V	⎓ 24 (positive logic)		
		Current	mA	7		
	Response time	Change to state 1	ms	10 (±30 %)		
		Change to state 0	ms	10 (±30 %)		
	Input type			Resistive		
Discrete outputs	Number			3, of which 2 dedicated to starter-controller coil operation		
	Max. current		mA	500		
	Short-circuit protection			Yes		
	Switching capacity			0.5 A/ ⎓ 24 V		
Indication/diagnostics				By 3 LEDs on front panel		















































## Characteristics of Advantys STB communication module LULC15



Physical interface			CAN
Connections			Fire Wire
Protocol			CAN 2.0 and CAN 2.B (passive mode)
Transmission speed		kbit/s	800
Addressing			Self-addressing
Supply for the discrete outputs and control	--- 24 V	V	20...28
	Current consumption	A	1.5 (max)
	Protection by gl fuse	A	2
Ambient air temperature		°C	Operation -25...+55
Discrete inputs	Number		2 (to be assigned according to configuration)
	Supply	V	--- 24
	Input current	mA	7
	Nominal input values	Voltage	V
		Current	mA
	Response time	Change to state 1	ms
		Change to state 0	ms
	Input type		Resistive
Discrete outputs	Number		3, of which 2 dedicated to starter-controller coil operation
	Max. current	mA	500
	Short-circuit protection		Yes
	Switching capacity		0.5 A / --- 24 V
Indication/diagnostics			By 3 LEDs on front panel



Connection characteristics						
Module type			LUFW10, LUFDH11, LUFDA01 and LUFDA10	LUFV2	ASILUFC5 and ASILUFC51	
					Inputs and 24 V auxiliary supply	Outputs
Connectors	Pitch		5.08	3.81	5.08	3.81
Flexible cable without cable end	1 conductor	mm <sup>2</sup>	0.2...1.5	0.14...1	0.2...1.5	0.14...1
	2 identical conductors	mm <sup>2</sup>	0.2...1	0.14...0.75	0.2...1	0.14...0.75
Flexible cable with cable end	Without insulated ferrule	1 conductor	mm <sup>2</sup>	0.25...1.5	0.25...1	0.25...1
		2 identical conductors	mm <sup>2</sup>	0.25...1	0.25...0.34	0.25...0.34
	With insulated ferrule	1 conductor	mm <sup>2</sup>	0.25...1.5	0.25...0.5	0.25...1.5
		2 identical conductors (Use a double cable end)	mm <sup>2</sup>	0.5...1	0.5	0.5
Solid cable without cable end	1 conductor	mm <sup>2</sup>	0.2...1.5	0.14...1	0.2...1.5	0.14...1
	2 identical conductors	mm <sup>2</sup>	0.2...1	0.14...0.5	0.2...1	0.14...0.5
Conductor size	1 conductor		AWG24... AWG16	AWG26... AWG16	AWG24... AWG16	AWG26... AWG16
Tightening torque		N.m	0.5...0.6	0.20...0.25	0.5...0.6	0.20...0.25
Flat screwdriver		mm	3.5	2.5	3.5	2.5
Module type			LULC033, LULC08 and LULC15	LUFC00	LULC09	
					Inputs and 24 V auxiliary supply	Connection on the bus
Connectors	Pitch		3.81	3.81	3.81	5 (Open Style) DeviceNet
Flexible cable without cable end	1 conductor	mm <sup>2</sup>	0.14...1	0.14...1	0.14...1	0.2...2.5
	2 identical conductors	mm <sup>2</sup>	0.14...0.75	0.14...0.75	0.14...0.75	0.5...1.5
Flexible cable with cable end	Without insulated ferrule	1 conductor	mm <sup>2</sup>	0.25...1	0.25...1	0.25...2.5
		2 identical conductors	mm <sup>2</sup>	0.25...0.34	0.25...0.34	0.25...1
	With insulated ferrule	1 conductor	mm <sup>2</sup>	0.25...0.5	0.25...0.5	0.25...2.5
		2 identical conductors (Use a double cable end)	mm <sup>2</sup>	0.5	0.75	0.5...1.5
Solid cable without cable end	1 conductor	mm <sup>2</sup>	0.14...1	0.14...1	0.14...1	0.2...2.5
	2 identical conductors	mm <sup>2</sup>	0.14...0.5	0.14...0.5	0.14...0.5	0.14...0.5
Conductor size	1 conductor		AWG26... AWG16	AWG26... AWG16	AWG26... AWG16	AWG24... AWG16
Tightening torque		N.m	0.20...0.25	0.20...0.25	0.20...0.25	0.5...0.6
Flat screwdriver		mm	2.5	2.5	2.5	3.5



Knob positions - Poles and Signaling contact states								
TeSys U operating status	Position of rotary knob	Indication on front panel	N/O pole contact	N/C pole contact	N/O contact any fault	N/C contact any fault	ⓘ N/O contact product ready	N/C contact Rotary knob on OFF position
References of add-on contact blocks and auxiliary contact modules Terminal referencing	—	—	—	LUFN11 31-32	LUA1C20 97-98	LUA1C11 95-96	LUA1C20 17-18	—
	or	—	—	LUFN02 31-32 41-42	LUA1C200 No terminal block	LUA1C110 No terminal block	LUA1C200 No terminal block	LUA8E20 57/58 67/68
	or	—	LUFN20 33-34 43-44	LUB9N11 21-22	—	—	LUA1C11 17-18	—
	or	—	LUFN11 43-44	—	—	—	LUA1C110 No terminal block	—
	or	—	LUB9N11 13-14	—	—	—	—	—
Off	OFF 	0						
Ready to operate		0						
Start		1						
Tripped on short-circuit	TRIP 	I>>						
Tripped on thermal overload	Manual reset mode	TRIP 	0					
	Automatic reset on thermal overload fault mode		0					
	Remote reset mode		0					

N/O contact  in closed position.N/C contact  in open position.



Data profile under AS-Interface						
Control unit present in the product				Standard LUCA	Advanced LUCB, CC, CD	Multifunction LUCM
Status		D0	Ready (available)			
		D1	Poles closed (running)			
Commands		D0	Start - forward running			
		D1	Start - reverse running			

#### Main registers accessible with Modbus, CANopen, Advantys STB, Profibus DP and DeviceNet communication modules.


For other registers and for further information, please consult the User's Manual *Communication variables* on the website [www.schneider-electric.com](http://www.schneider-electric.com)

Control unit present in the product				Standard	Advanced	Multifunction
Marking	Register 0...Register 99	Words...Bits	Commercial reference, serial number, software version			
Log	Register 100...Register 450	Words...Bits	Fault log, Operating log, Log of last 5 trips			
Status	Register 451...Register 464	Words...Bits	Alarm signalling (bits), Fault signalling (bits)			
Values	Register 465...Register 473	Words	Irms phase 1, phase 2, phase 3. Motor load, thermal status Earth leakage current. Phase imbalance and phase failure			
	Register 474...Register 599	Words...Bits	Reserved			
Configuration	Register 600...Register 699	Words...Bits	Protection and alarm thresholds, fallback mode and reset mode			
Commands	Register 700...Register 714	Words...Bits	Commands			

Status and values	Register 452	Bit 0	Short-circuit fault			
		Bit 1	Overcurrent fault			
		Bit 2	Thermal overload fault			
	Register 455	Bit 0	Ready (available)			
		Bit 1	Poles closed			
		Bit 2	Fault			
		Bit 3	Alarms			
		Bit 4	Tripped ("TRIP" position)			
		Bit 5	Fault acknowledgement allowed			
		Bit 6	Reserved			
		Bit 7	Motor running			
		Bit 8	Motor current % (bit 0)			
		Bit 9	Motor current % (bit 1)			
		Bit 10	Motor current % (bit 2)			
		Bit 11	Motor current % (bit 3)			
		Bit 12	Motor current % (bit 4)			
		Bit 13	Motor current % (bit 5)			
		Bit 14	Reserved			
		Bit 15	Motor starting			
	Register 461	Bit 3	Thermal overload alarm			
	Register 465	Word	Thermal status value			
	Register 466	Word	Motor load value (Im/Ir)			

Configuration	Register 602	Bit 0	Manual reset on thermal overload fault			
		Bit 1	Remote reset on thermal overload fault			
		Bit 2	Automatic reset on thermal overload fault			
	Register 682	Value 0	Fallback mode validation			
		Value 1	Outputs OA1 and OA3 unchanged			
		Value 2	Outputs OA1 and OA3 forced to 0			
		Value 3	Outputs OA1 and OA3 unchanged, signalling existence of communication failure			
		Value 4	Outputs OA1 forced to 1 and OA3 unchanged			
		Value 5	Outputs OA3 forced to 1 and OA1 unchanged			

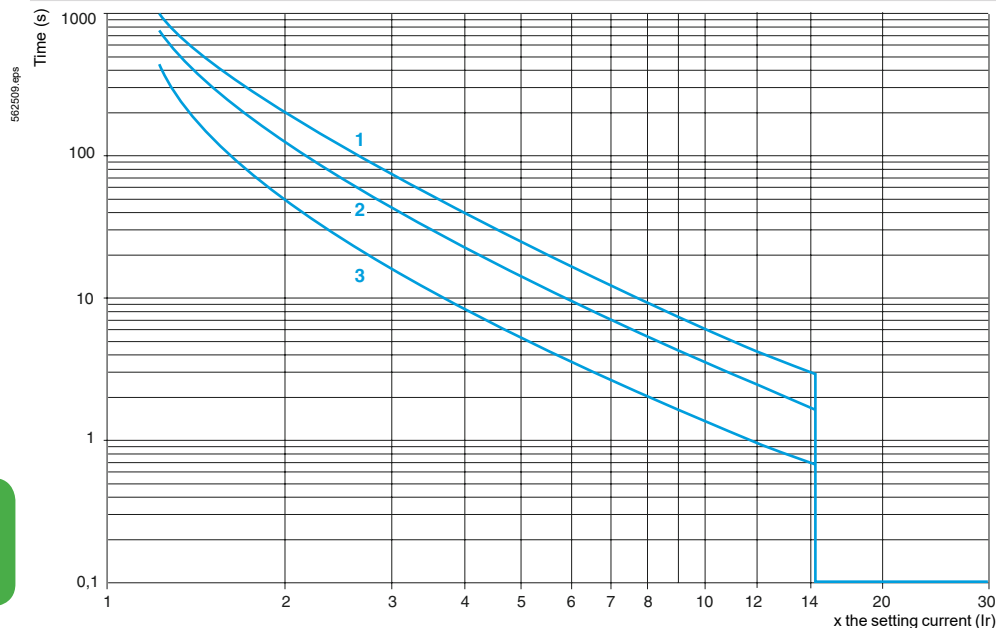
Commands	Register 700	Bit 0	LO1 output command			
	Register 704	Bit 0	OA1 output command			
		Bit 1	OA3 output command			
		Bit 2	Reserved			
		Bit 3	Fault acknowledgement			
		Bit 4	Reserved			
		Bit 5	Trip test			
		Bit 6...15	Reserved			

 Data accessible



### Tripping curves for control units LUCA, LUCB, LUCD

Average operating times at 20 °C according to multiples of the setting current, tolerance :  $\pm 20\%$ .

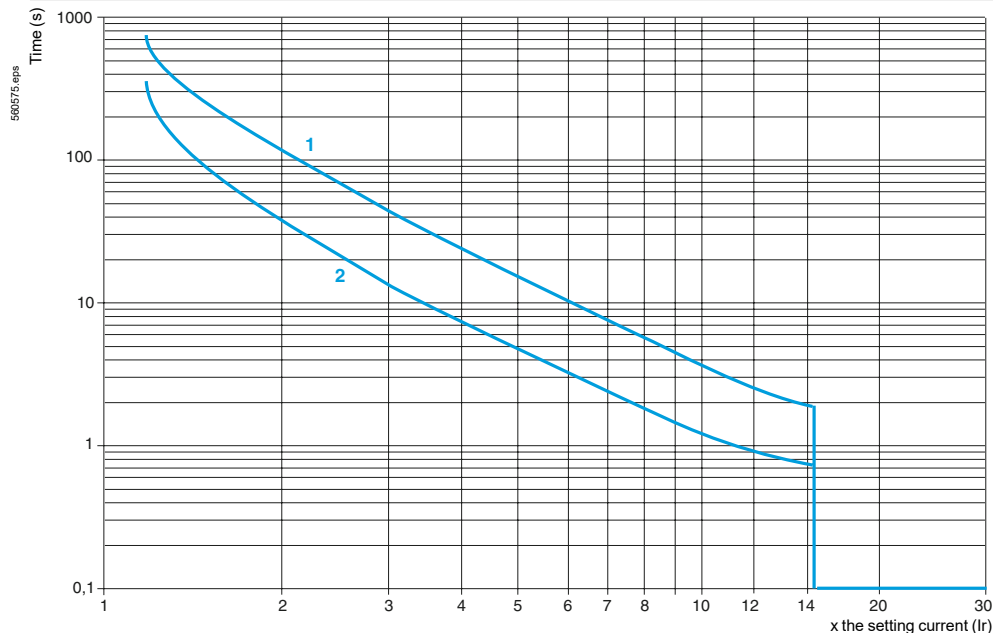


Ref.

- 1 LUCD, 3 poles from cold state, class 20.
- 2 LUCA, LUCB, 3 poles from cold state, class 10.
- 3 LUCA, LUCB, LUCD, 3 poles from hot state.

### Tripping curves for control units LUCC

Average operating times at 20 °C according to multiples of the setting current, tolerance :  $\pm 20\%$ .



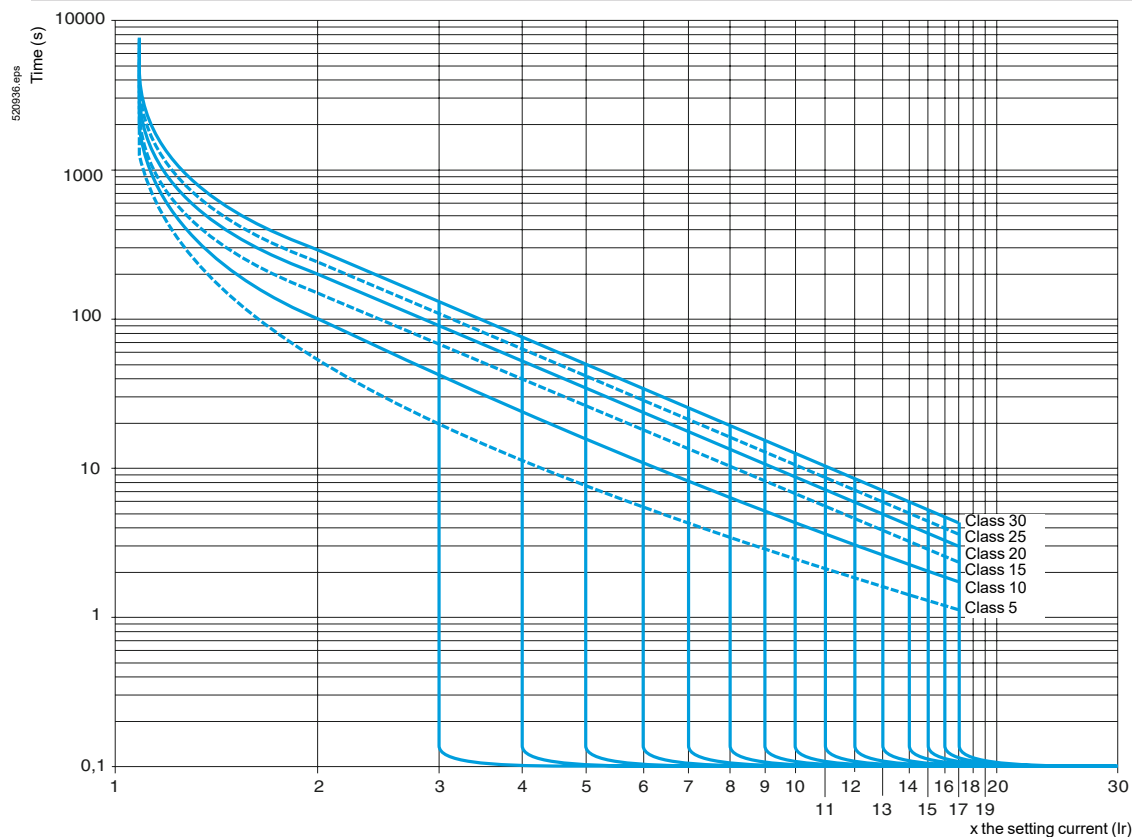
- 1 LUCC, single-phase, cold state.
- 2 LUCC, single-phase, hot state.



#### Tripping curves for control units LUCM

##### Cold state curves

Average operating times at 20 °C according to multiples of the setting current, tolerance :  $\pm 20\%$ .

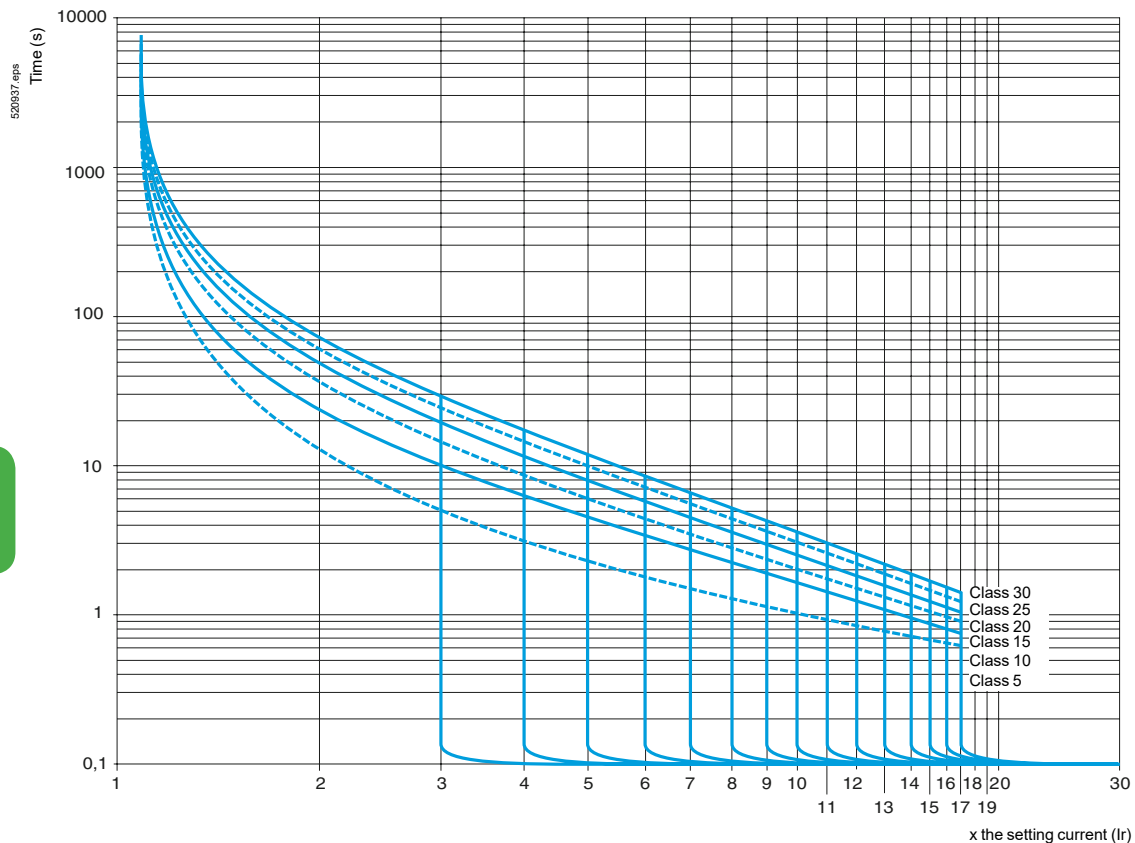




## Tripping curves for control units LUCM

### Hot state curves

Average operating times at 20 °C according to multiples of the setting current, tolerance :  $\pm 20\%$



TeSys U

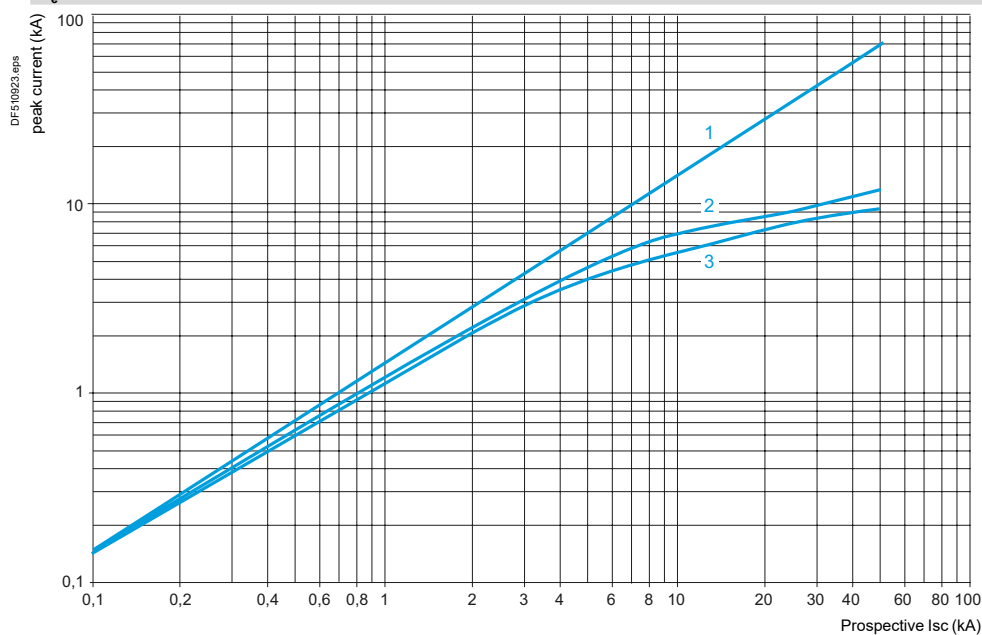
Ref.





#### Current limitation on short-circuit

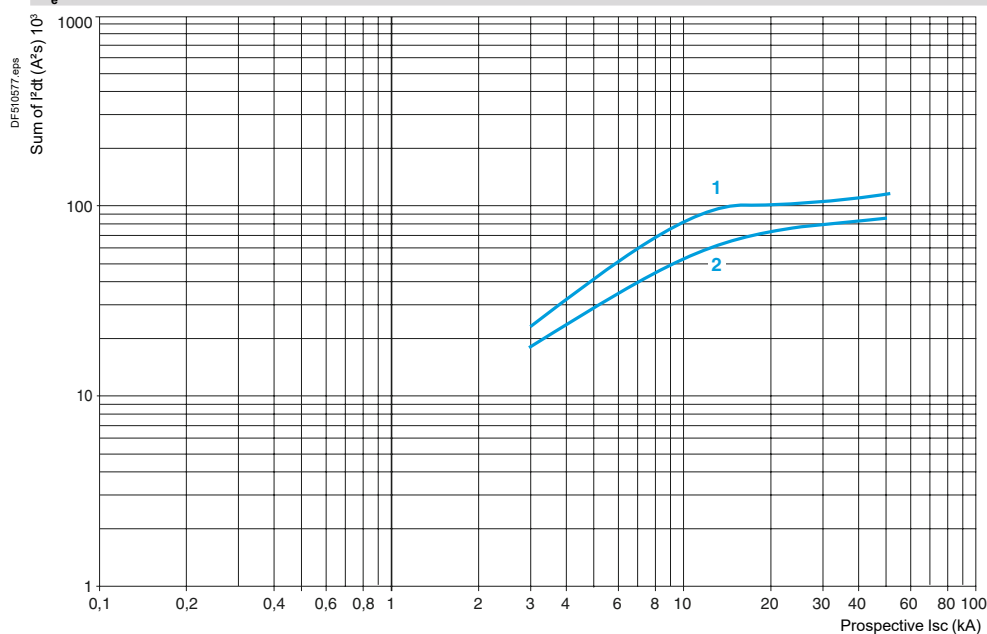
$U_n = 460 \text{ V}$



- 1 Maximum peak current
- 2 32 A, 38 A power base
- 3 12 A power base

#### Thermal limit on short-circuit

$U_n = 460 \text{ V}$



- 1 32 A, 38 A power base
- 2 12 A power base

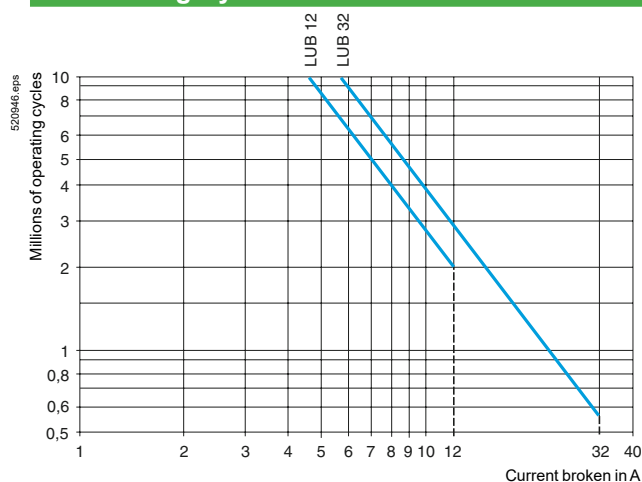


# TeSys

## TeSys U All-in-one motor starters

### Curves

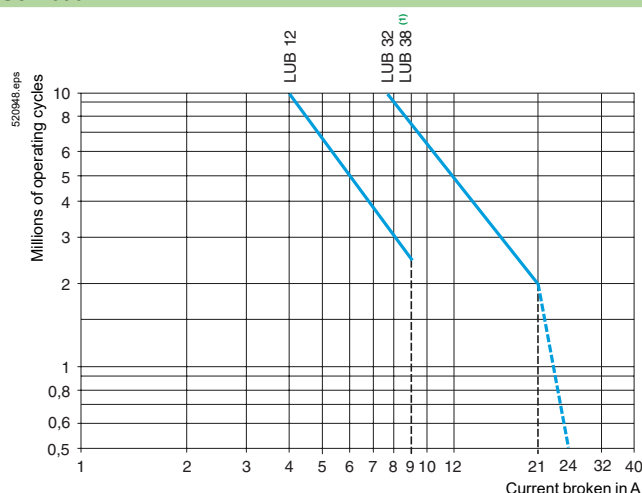
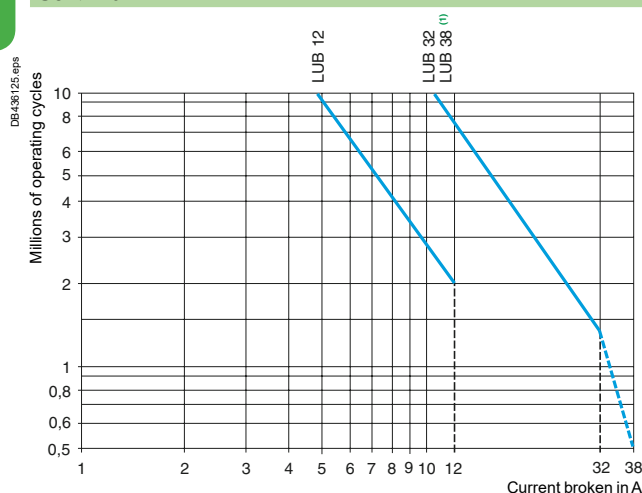
#### Use in category AC-41



#### Use in category AC-43

$U_e \leq 440 \text{ V}$

$U_e = 690 \text{ V}$



(1) Plain curve: LUB32 + LUB38, dotted curve: LUB38 only.



# TeSys

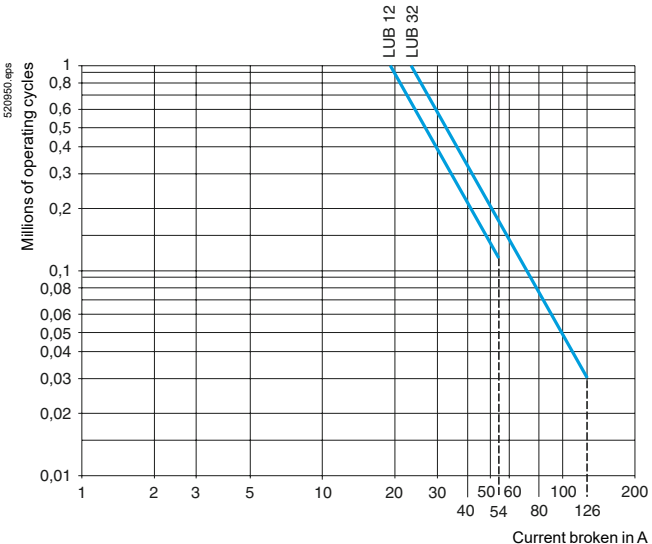
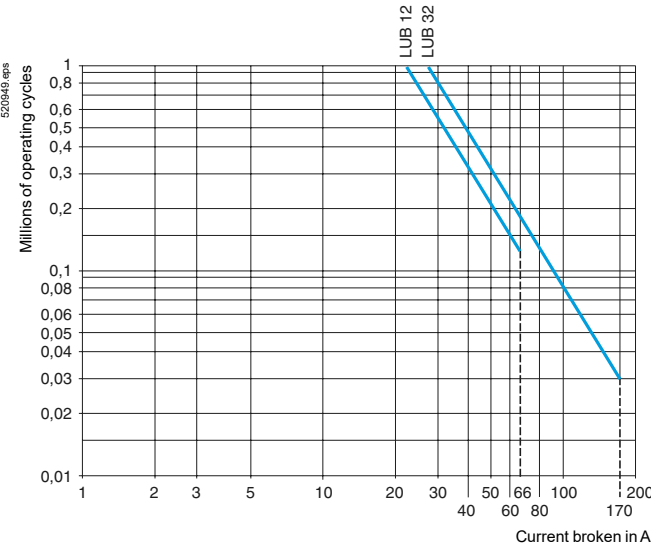
## TeSys U All-in-one motor starters

### Curves

Use in category AC-44

$U_e \leq 440 \text{ V}$

$U_e = 690 \text{ V}$



TeSys U

Ref.





# TeSys

## TeSys U All-in-one motor starters

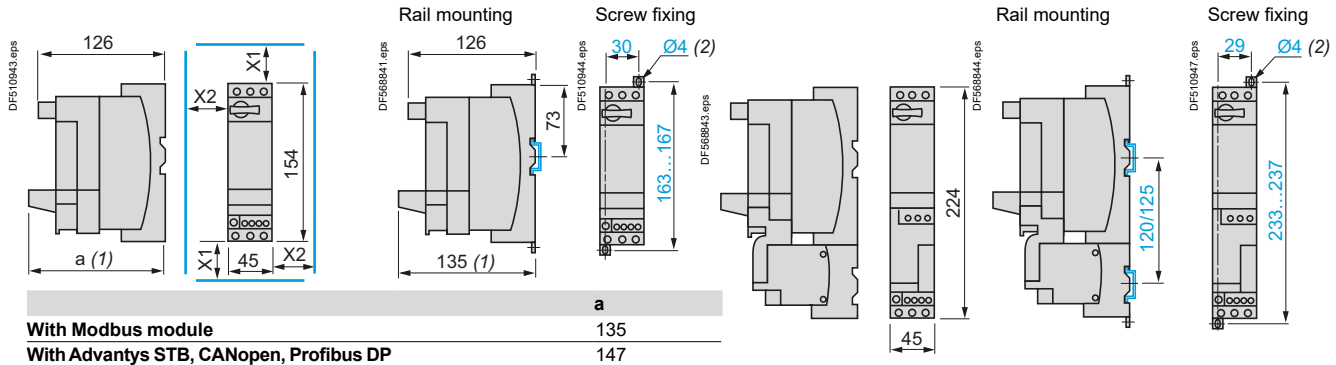
### Dimensions

#### Dimensions

##### Starter-controllers

LUB: non-reversing

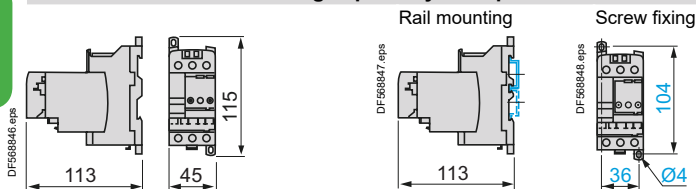
LU2B: reversing



Minimum electrical clearance:

X1 = 50 mm for Ue = 440 V and 70 mm for Ue = 500 and 690 V, X2 = 0

##### Reverser block for mounting separately from power base

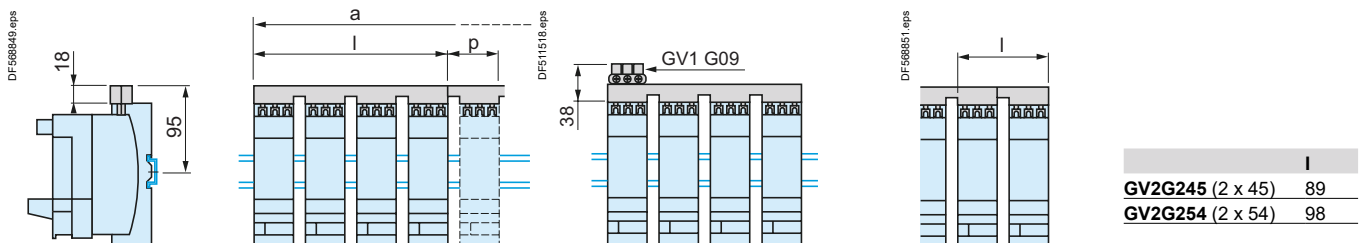


##### Sets of busbars and plug-in power sockets

GV2G445 and GV2G454

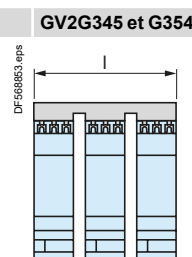
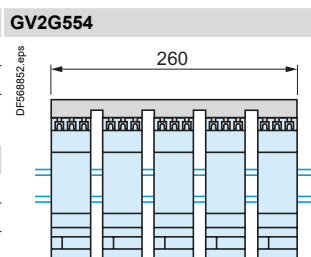
GV2G... with terminal block GV1G09

GV2G245 and G254



	I	P
GV2G445 (2 x 45)	179	45
GV2G454 (2 x 54)	206	54

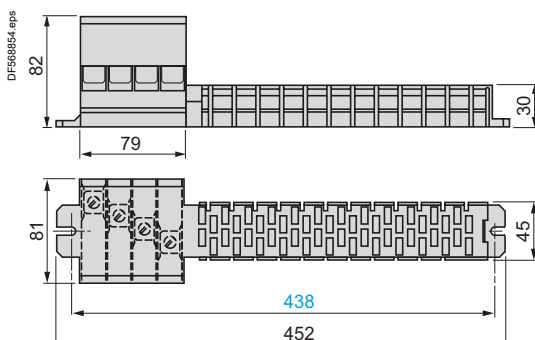
	a	5	6	7	8
Number of tap-offs		5	6	7	8
GV2G445 (2 x 45)	224	269	314	359	
GV2G454 (2 x 54)	260	314	368	422	



	I
GV2G345 (2 x 45)	134
GV2G354 (2 x 54)	152

AK5JB144

AK5PC13, PC33, PC33L



(1) Depth with communication module.

(2) Retractable fixing lugs.

References:  
pages A4/10 and A4/11

Characteristics:  
page A4/42

Curves:  
pages A4/54 to A4/59

Schemes:  
pages A4/61 to A4/74



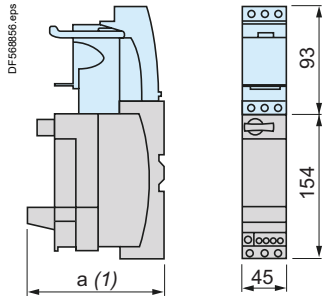
# TeSys

## TeSys U All-in-one motor starters

### Dimensions

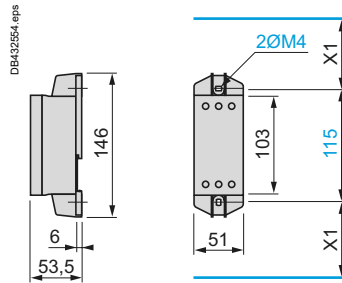
#### Dimensions, mounting

##### Limiter-disconnector LUALB1 Disconnecter LUALB10



a	
With Modbus module	135
With Advantys STB, CANopen, Profibus DP or DeviceNet modules	147

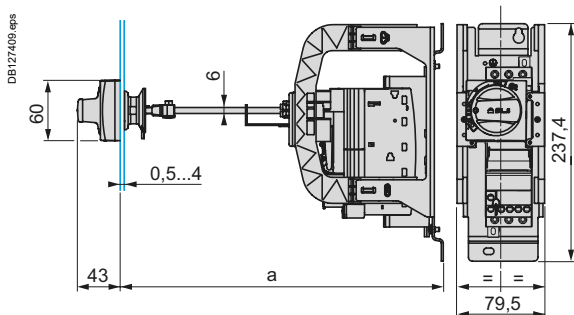
##### Current limiter LA9LB920



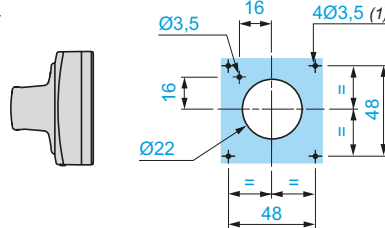
X1: Electrical clearance = 30 mm for  $U_e \leq 690$  V

#### Door interlock mechanisms

##### LU9APN21, LU9APN22, LU9APN24



##### Door cut-out

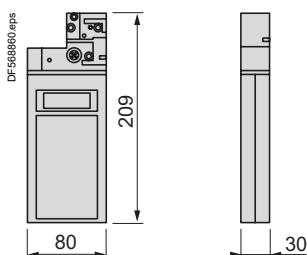


(1) For IP65 only.

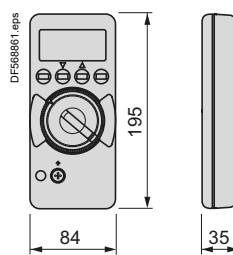
	a	
	Mini	Maxi
LU9APN●●	191	300
LU9APN●● + GVAPK12	300	483

#### Addressing consoles

##### XZMC11

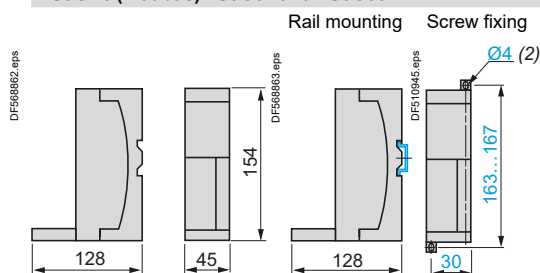


##### ASITERV2

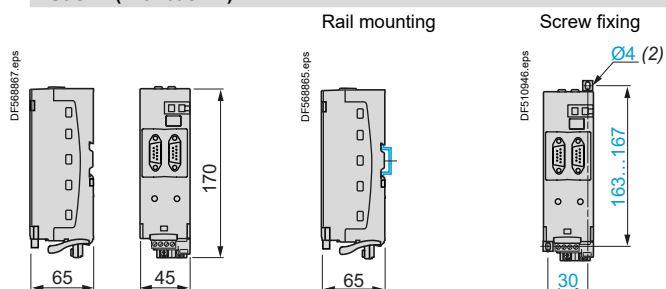


#### Splitter boxes

##### LU9GC3 (Modbus) LU9G02 and LU9G03



##### LU9GC7 (Profibus DP)



(1) Depth with communication module.

(2) Retractable fixing lugs.

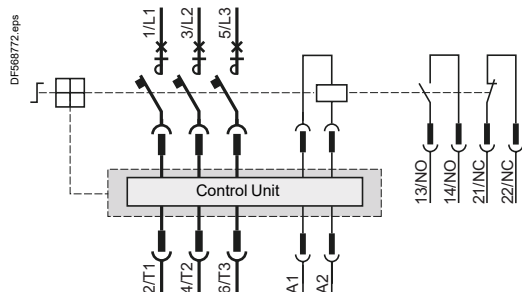
References:  
pages A4/20, A4/31, A4/32



#### 12, 32, 38 A power bases with standard, advanced or multifunction control unit

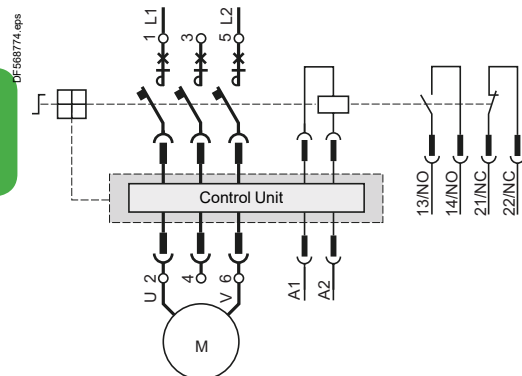
##### LUB

###### Non-reversing



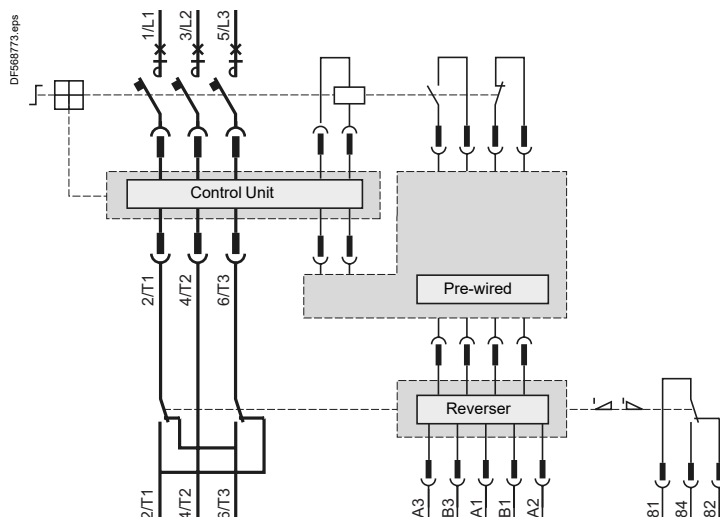
##### With control unit LUCC or LUCM

###### Connection of a single-phase motor

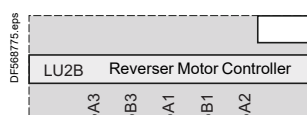


##### LU2B

###### Reversing

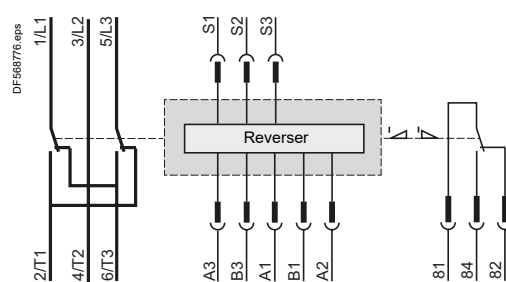


##### Control terminal block

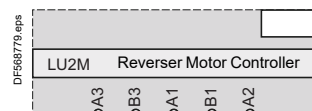


#### Reverser blocks

##### LU2M

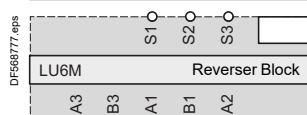


##### Control terminal block

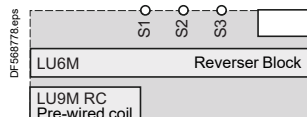


##### LU6M

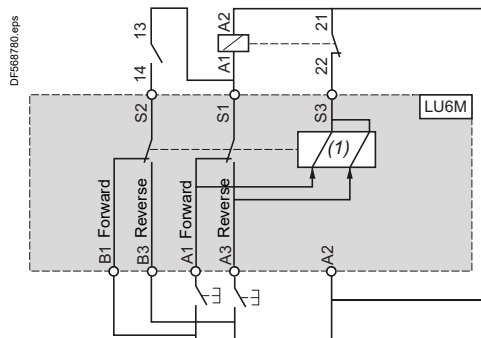
###### Control terminal blocks



###### With pre-wired connector LU9MRC



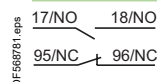
###### Basic scheme



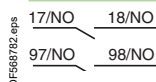
- S1 Start next stage
- S2 Electrical interlocking
- S3 Maintaining contact
- B1 Maintain forward running
- B3 Maintain reverse running
- A1 Pulse forward running
- A2 Common
- A3 Pulse reverse running
- (1) Electronically operated bistable electromagnet.

#### Add-on contact blocks

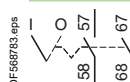
##### LUA1C11



##### LUA1C20

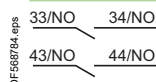


##### LUA8E20

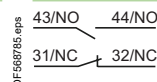


#### Add-on contact modules

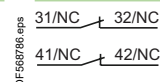
##### LUFN20



##### LUFN11



##### LUFN02

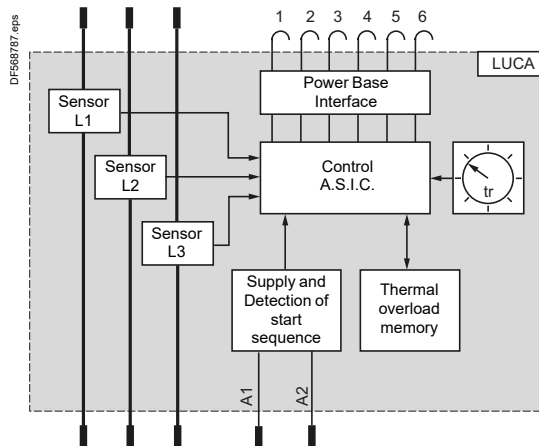




#### Control units

##### Standard control units LUCA

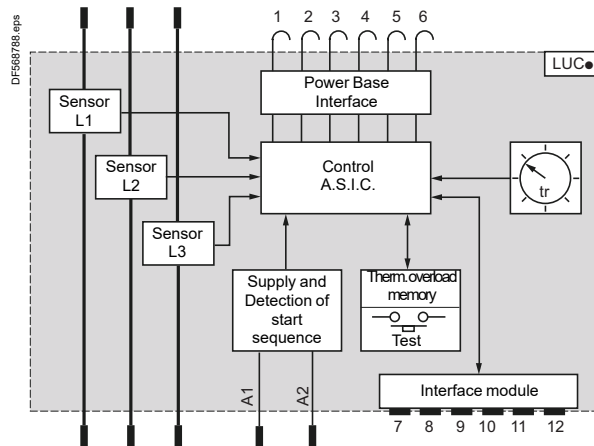
Basic scheme



- 1 and 2 Trips
- 3 and 4 Electromagnet
- 5 Power base rating
- 6 N/C

##### Advanced control units LUCB, LUCC, LUCD

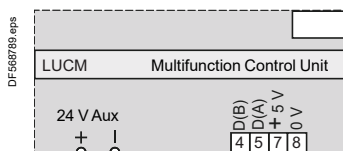
Basic schemehd



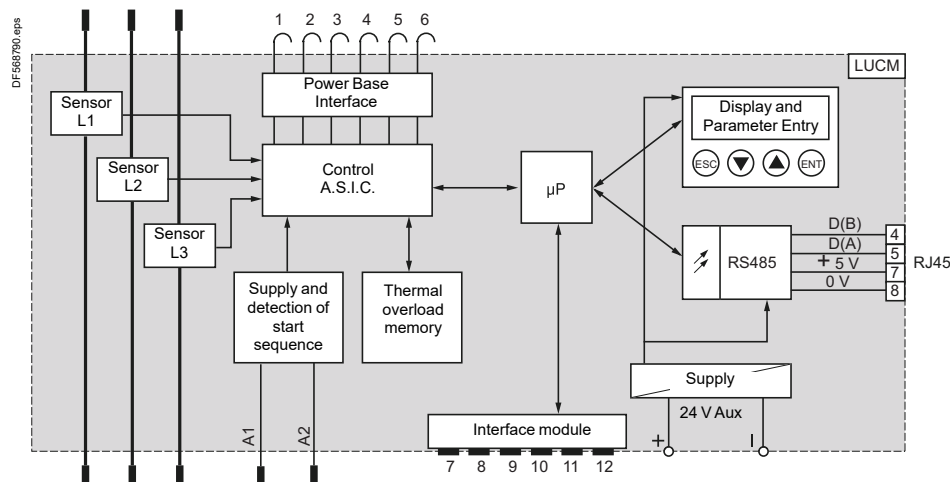
- 1 and 2 Trips
- 3 and 4 Electromagnet
- 5 Power base rating
- 6 N/C
- 7 Earth
- 8 Thermal status/Set
- 9 Reset mode/Reset
- 10 (Im/Ir)
- 11 Vc2
- 12 Vc1

##### Multifunction control units LUCM

Control terminal block



Basic scheme



- 1 and 2 Trips
- 3 and 4 Electromagnet
- 5 Power base rating
- 6 N/C
- 7 Earth
- 8 N/C
- 9 Earth
- 10 (Im/Ir)
- 11 Rx/Tx
- 12 Vc1

References:  
pages A4/11 and A4/12

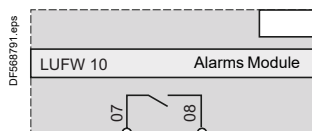
Characteristics:  
pages A4/45 to A4/47

Curves:  
pages A4/54 to A4/56

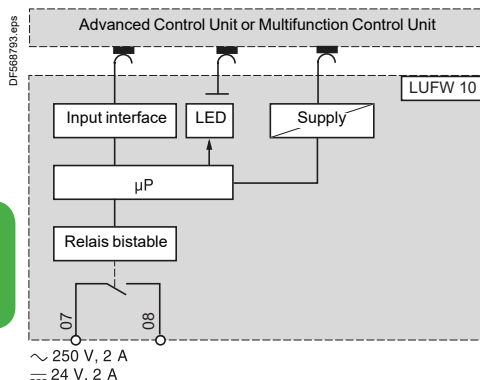


#### Function modules

##### Alarm LUFW10

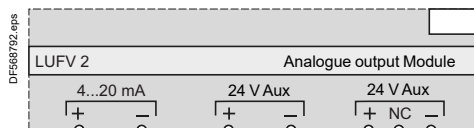


##### Basic scheme

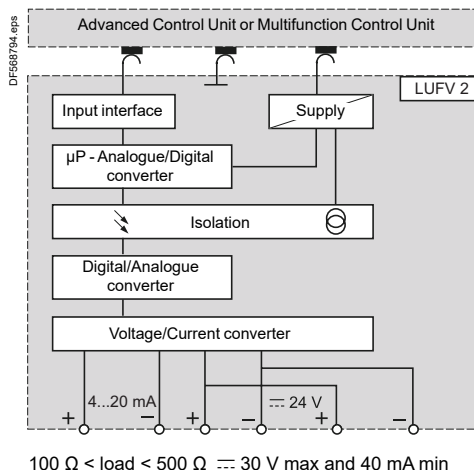


##### Indication of motor load LUFV2

##### 4-20 mA output



##### Basic scheme

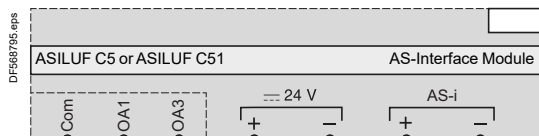


100 Ω < load < 500 Ω 24 V max and 40 mA min

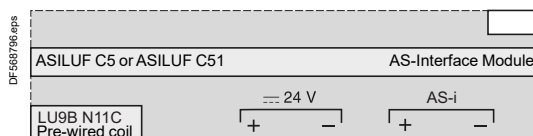
#### Communication modules

##### Communication modules ASILUFC5 and ASILUFC51

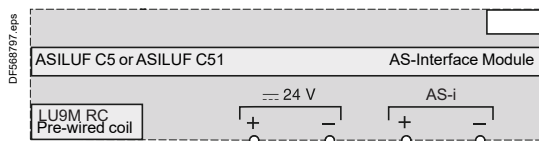
##### Without pre-wired coil connection



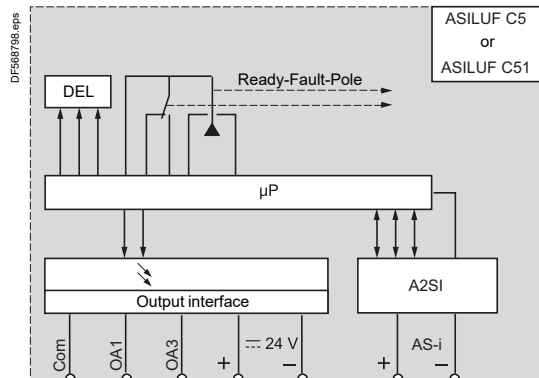
##### With pre-wired coil connection LU9BN11C



##### With pre-wired coil connection LU9MRC



##### Basic scheme





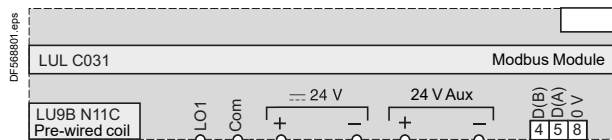
# TeSys

## TeSys U All-in-one motor starters - Terminal identifications

### Schemes

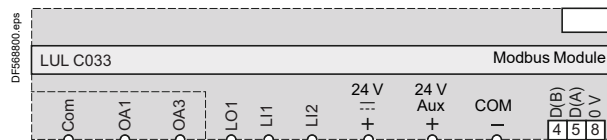
#### Communication modules (continued)

##### With pre-wired coil connection LU9BN11C

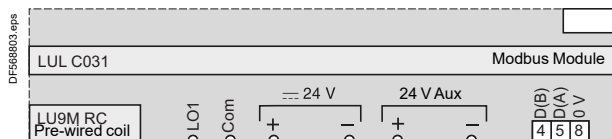


##### Modbus communication module LULC033

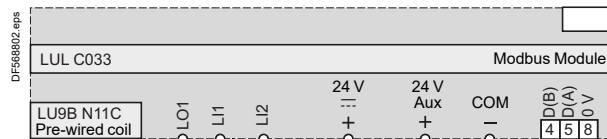
##### Without pre-wired coil connection



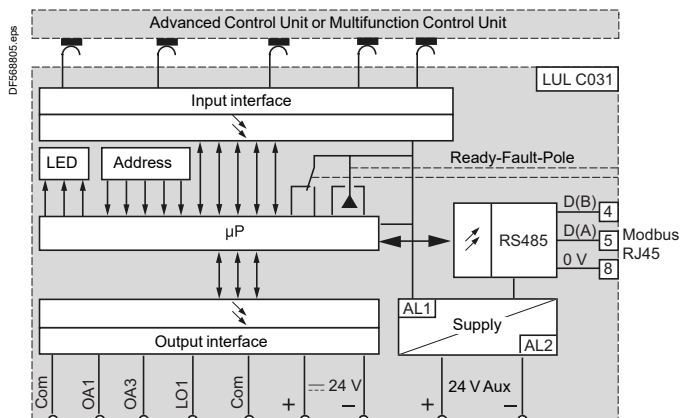
##### With pre-wired coil connection LU9MRC



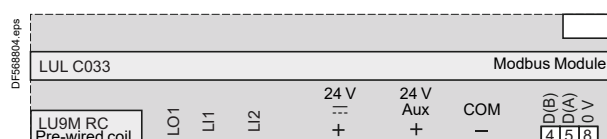
##### With pre-wired coil connection LU9BN11C



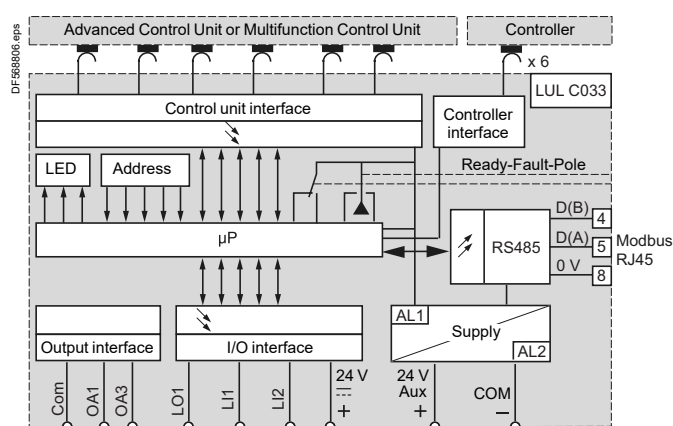
##### Basic scheme



##### With pre-wired coil connection LU9MRC



##### Basic scheme

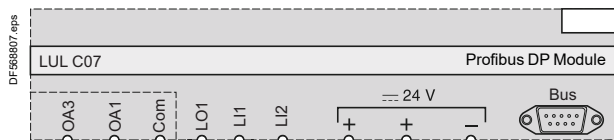




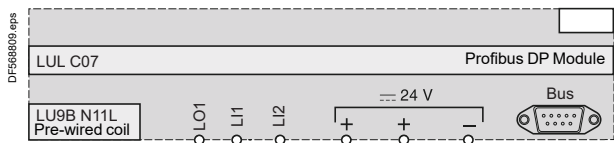
#### Communication modules (continued)

##### Profibus DP communication module LULC07

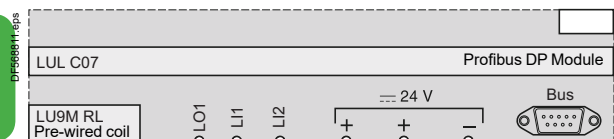
Without pre-wired coil connection



With pre-wired coil connection LU9BN11LC

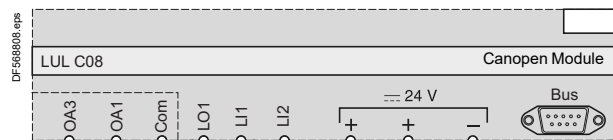


With pre-wired coil connection LU9MRC

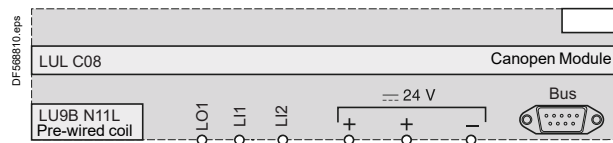


##### CANopen communication module LULC08

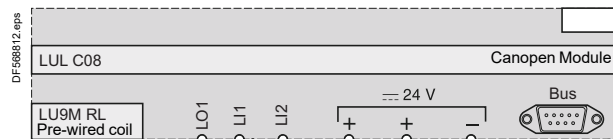
Without pre-wired coil connection



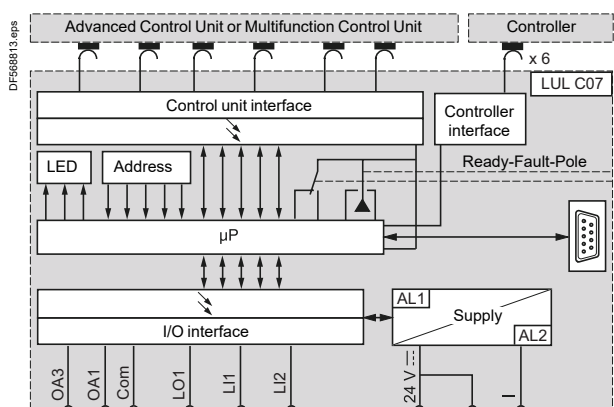
With pre-wired coil connection LU9BN11LC



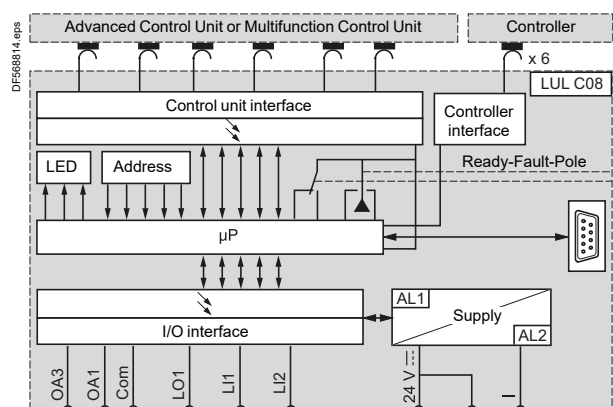
With pre-wired coil connection LU9MRC



#### Basic scheme

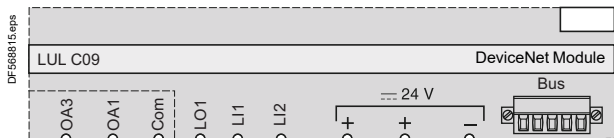


#### Basic scheme

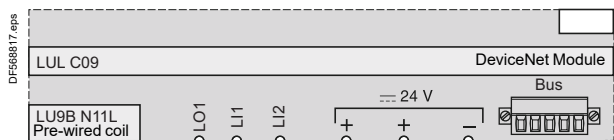


##### DeviceNet communication module LULC09

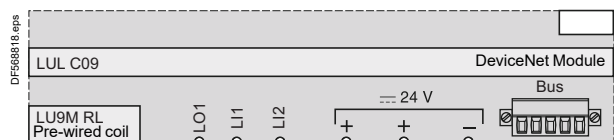
Without pre-wired coil connection



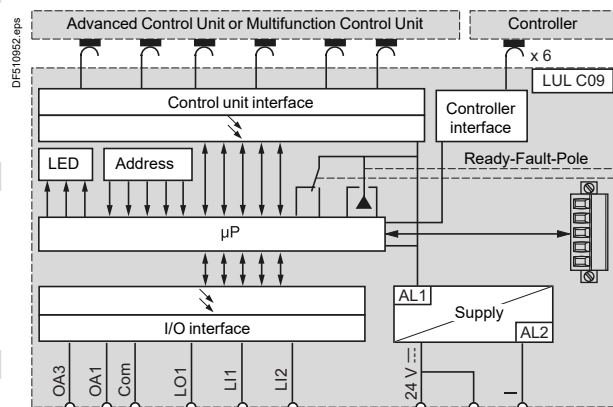
With pre-wired coil connection LU9BN11LC



With pre-wired coil connection LU9M RL



#### Basic scheme

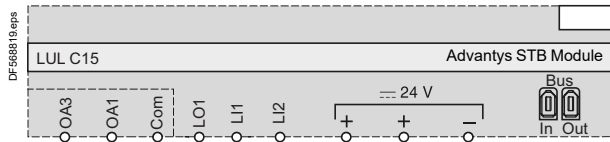




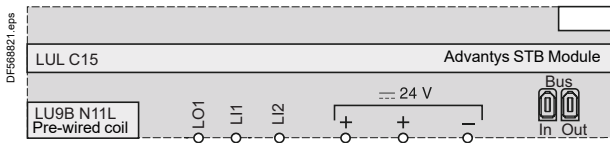
#### Communication modules (continued)

##### Advantys STB communication module LULC15

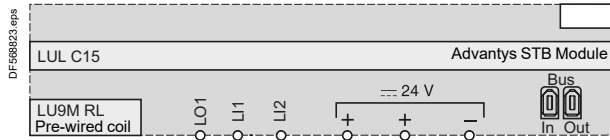
Without pre-wired coil connection



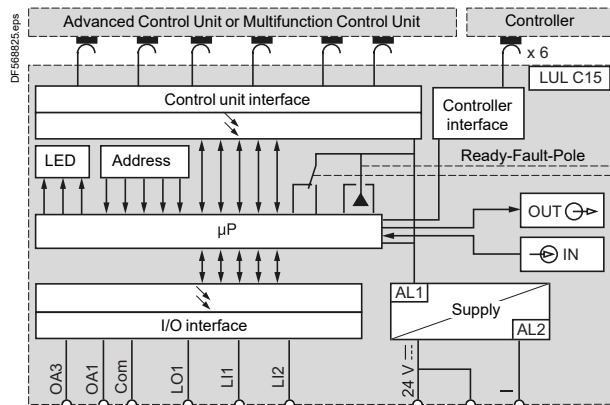
With pre-wired coil connection LU9BN11LC



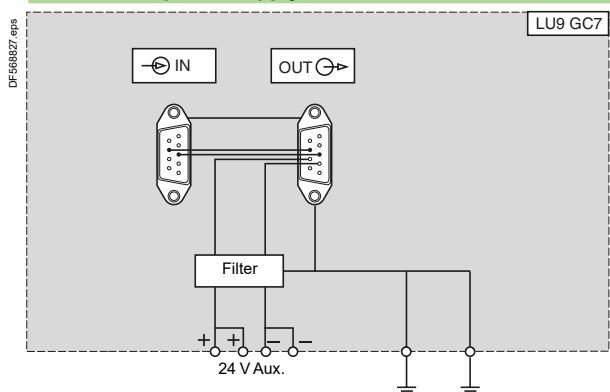
With pre-wired coil connection LU9MRC



Basic scheme



##### Profibus DP power supply module LU9GC7



##### Parallel wiring modules

Without pre-wired coil connection



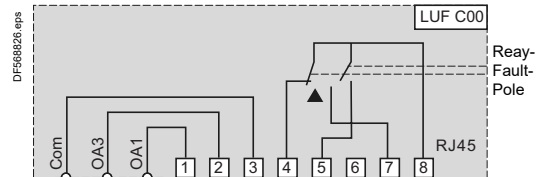
With pre-wired coil connection LU9BN11LC



With pre-wired coil connection LU9MRC



Basic scheme



- 1 Forward running
- 2 Reverse running
- 3 Output common
- 4 Selector in position
- 5 Pole state
- 6 Reserved
- 7 Fault
- 8 Input common



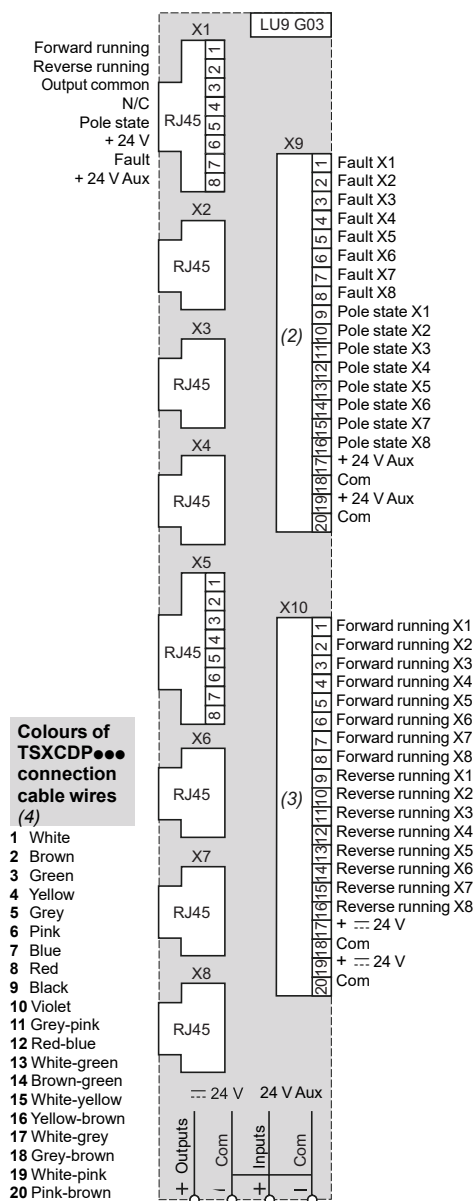
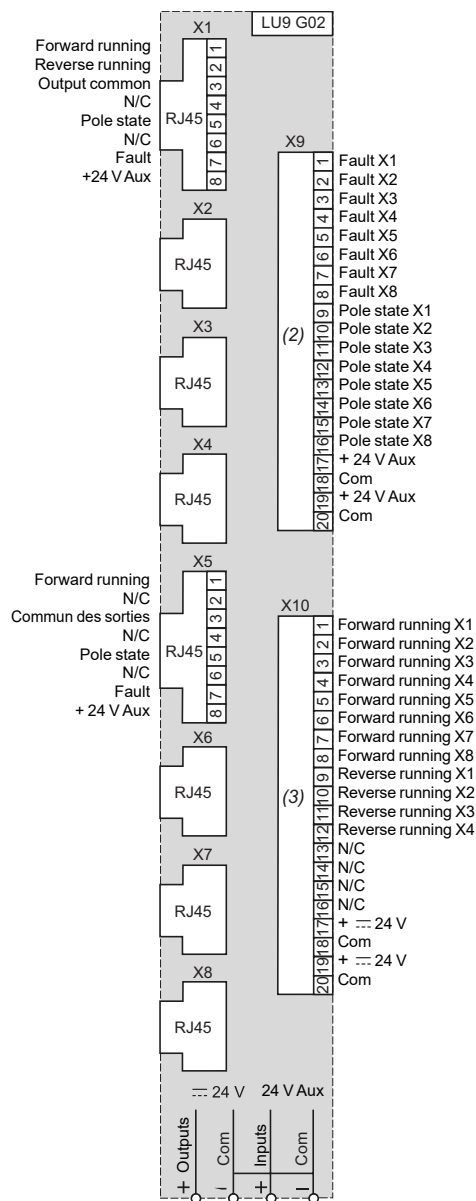
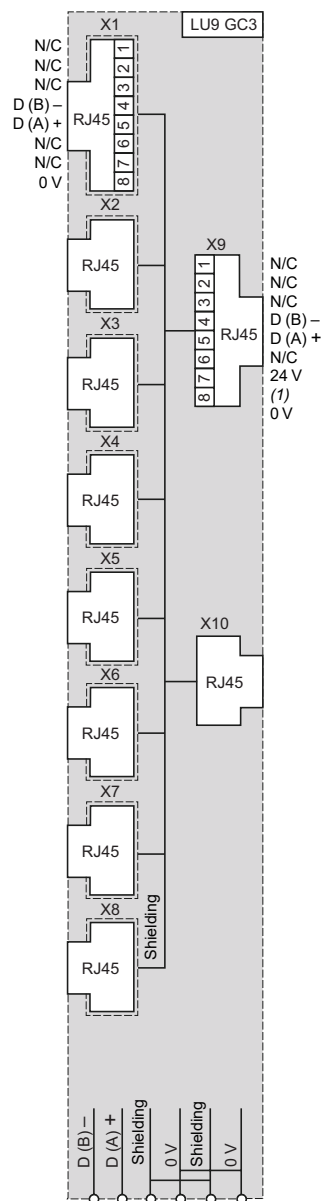
## Communication modules (continued)

## Wiring hub and splitter boxes

## Modbus hub LU9GC3

## Parallel wiring splitter box LU9G02

## Parallel wiring splitter box LU9G03



## Colours of TSXCDP... connection cable wires (4)

- 1 White
- 2 Brown
- 3 Green
- 4 Yellow
- 5 Grey
- 6 Pink
- 7 Blue
- 8 Red
- 9 Black
- 10 Violet
- 11 Grey-pink
- 12 Red-blue
- 13 White-green
- 14 Brown-green
- 15 White-yellow
- 16 Yellow-brown
- 17 White-grey
- 18 Grey-brown
- 19 White-pink
- 20 Pink-brown

(1) Not connected on connectors X1 to X8. Only present on RJ45 IN and OUT connectors.

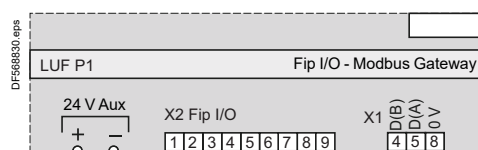
(2) 20-way HE10 input connector.

(3) 20-way HE10 output connector.

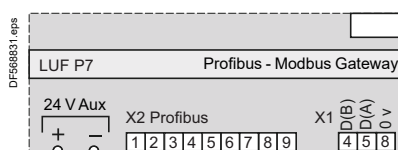
(4) Wire colours and corresponding HE10 connector pin numbers.

## Gateways

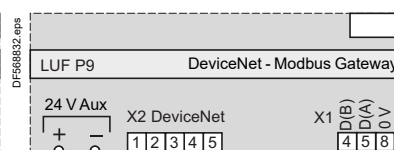
## LUF P1



## LUF P7

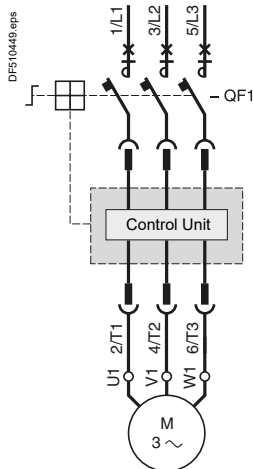


## LUF P9





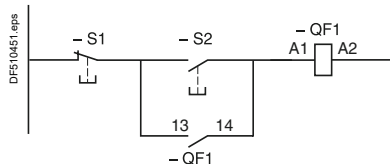
#### Non-reversing starter-controllers LUB



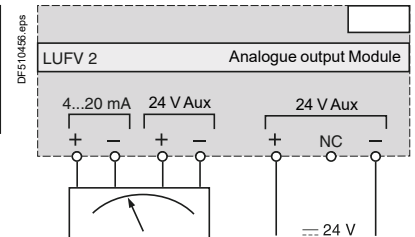
#### 2-wire control via 2-position switch



#### 3-wire control, pulsed start with maintaining contact

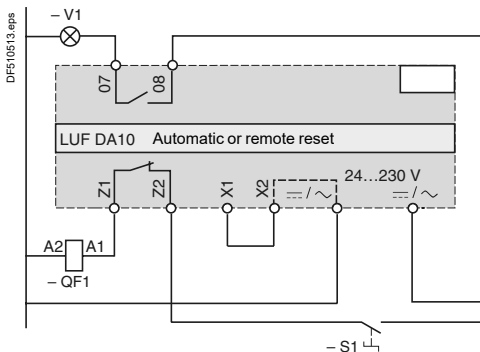


#### Connection of a motor load indicator module LUFV2

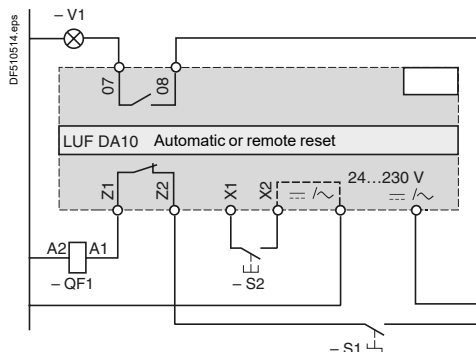


#### Connection of thermal overload fault signalling modules LUFDA10

##### Automatic reset

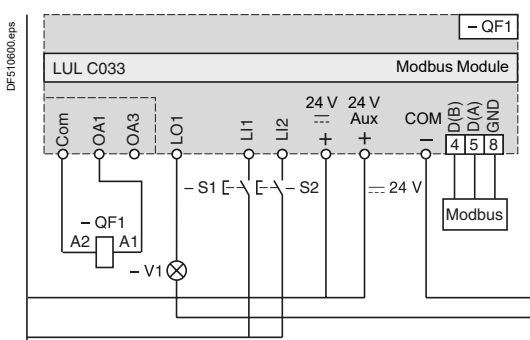


##### Remote reset



#### Control via Modbus communication module LULC033

##### Without pre-wired coil connection

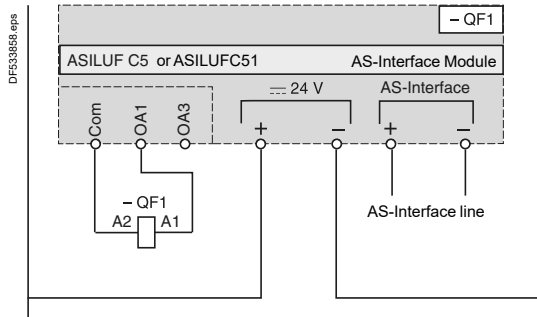




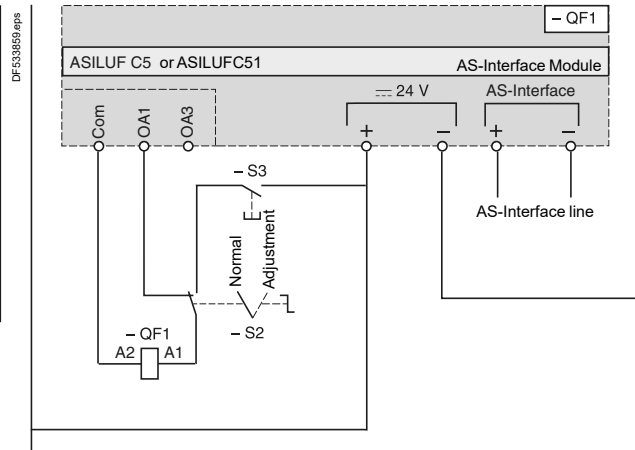
#### Non-reversing starter controllers LUB (continued)

##### Control by communication modules ASILUFC5 and ASILUFC51

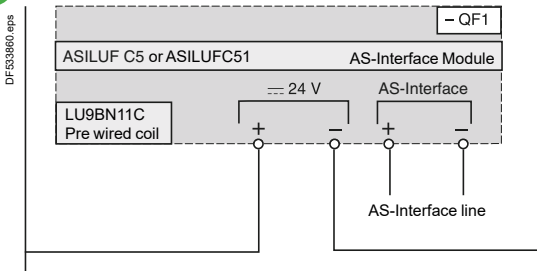
###### Without pre-wired coil connection



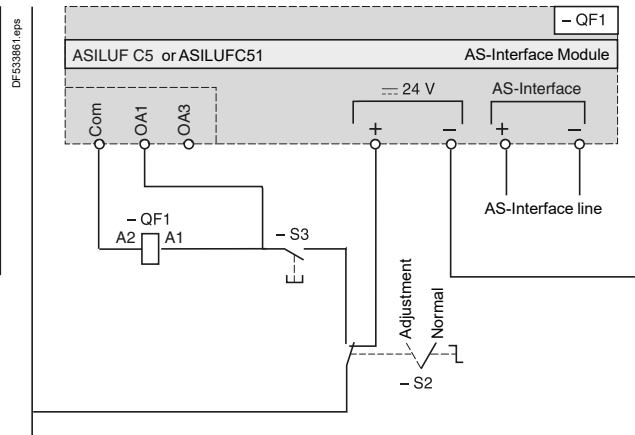
###### Without pre-wired coil connection With local control



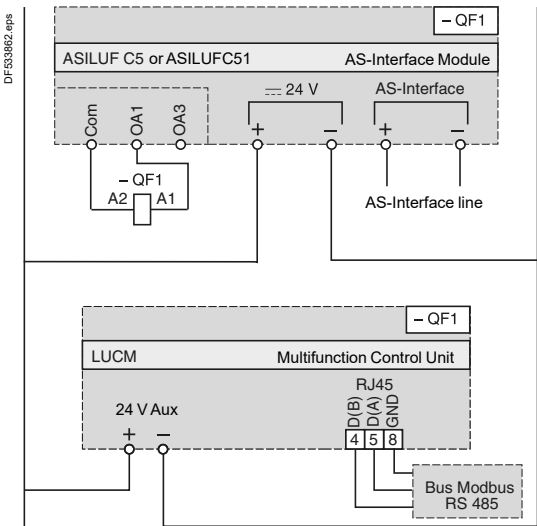
###### With pre-wired coil connection LU9BN11C



###### Without pre-wired coil connection With local control



###### Without pre-wired coil connection With multifunction control unit LUCM

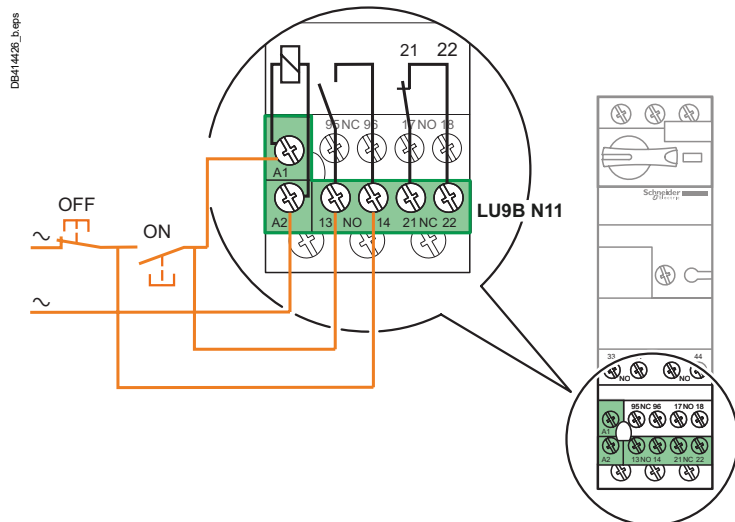




#### Standard or advanced power base

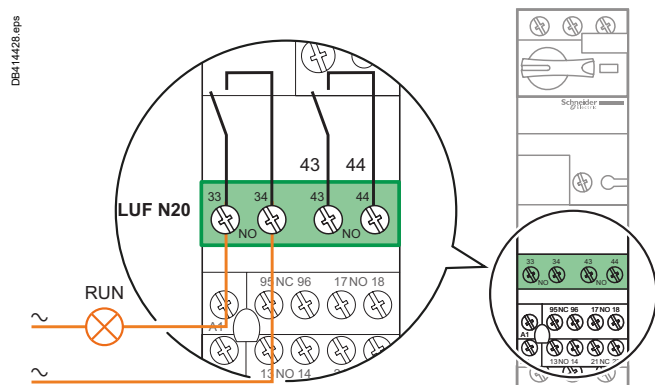
##### ON/OFF control (1 direction of rotation)

##### Push buttons wiring

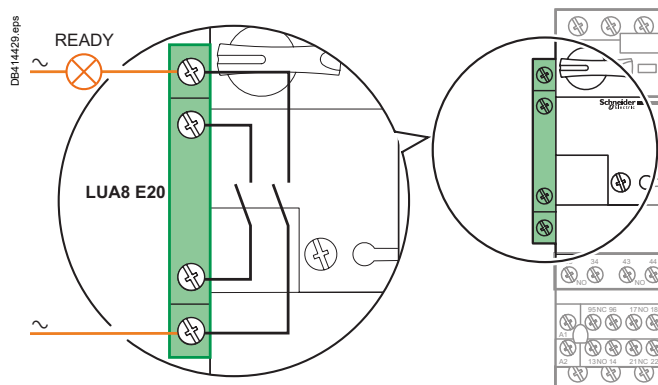


#### ON indication

##### "Motor RUN" indicator wiring

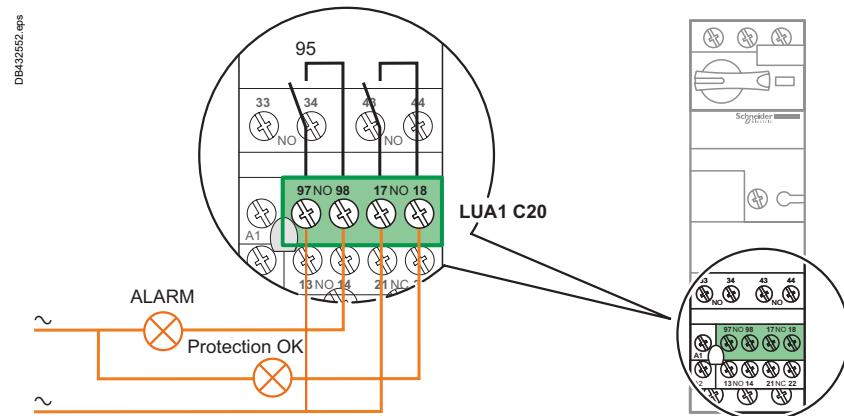


##### "Motor starter READY" indicator wiring



#### ALARM indication

##### Protection device status indicator wiring

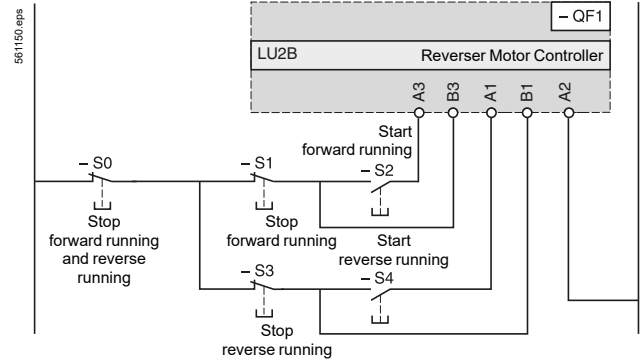
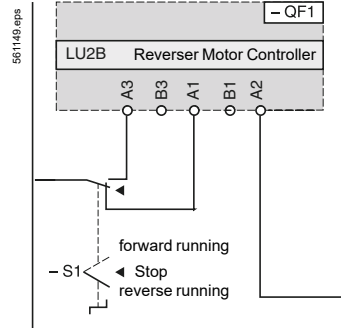
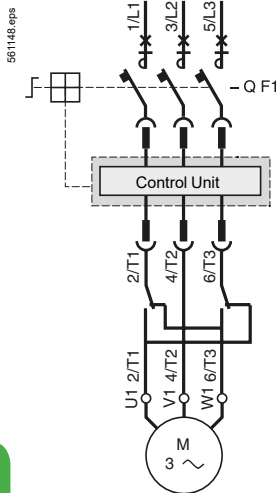




#### Reversing starter-controllers LUB

##### 2-wire control via 3-position switch

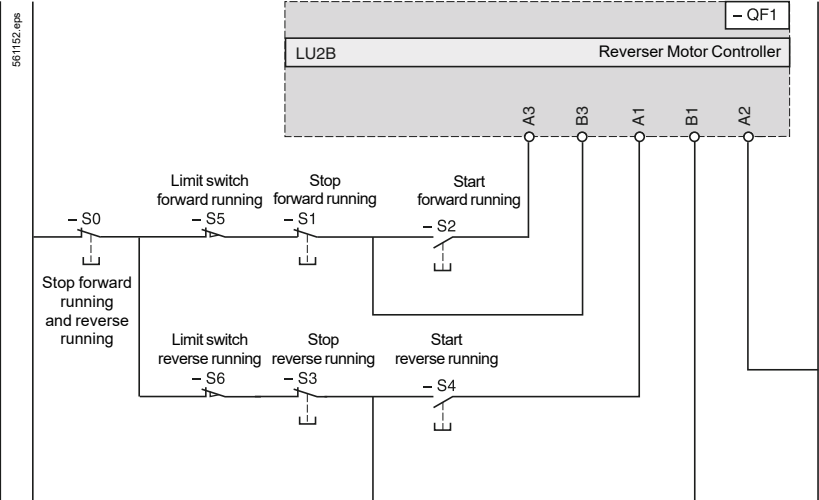
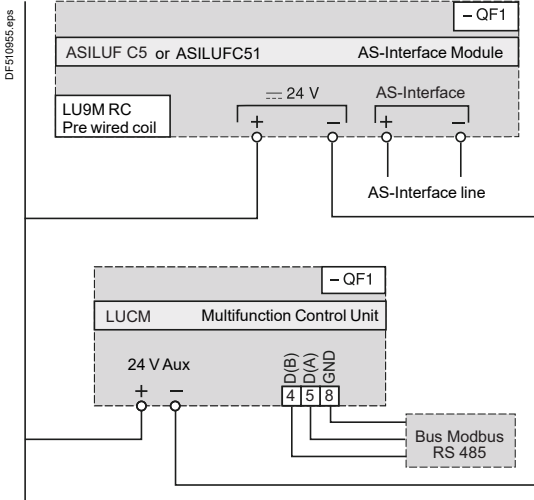
##### 3-wire control, pulsed start with maintaining contact



#### Control by communication modules ASILUFC5 and ASILUFC51

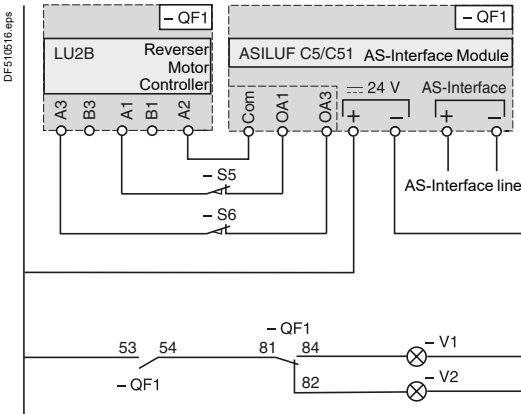
With pre-wired coil connection LU9MRC  
With multifunction control unit LUCM

#### 3-wire control, pulsed start with maintaining contact and limit switches



#### Control by communication modules ASILUFC5 and ASILUFC51

Without pre-wired coil connection  
With running direction pilot lights and limit switches

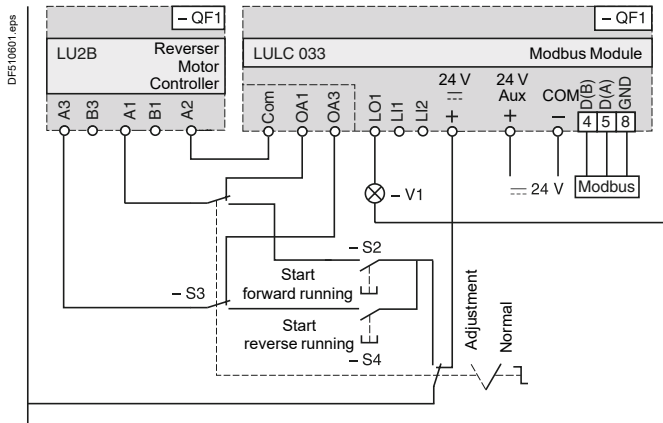




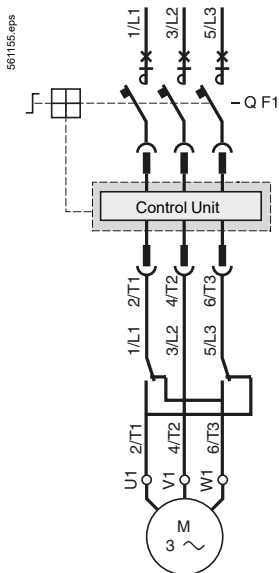
## Reversing starter controllers LU2B (continued)

## Control via Modbus communication module LULC033

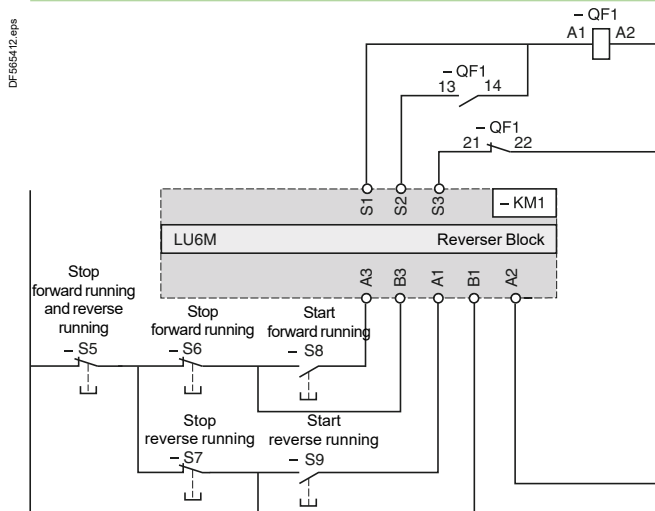
**Without pre-wired coil connection. With local control**



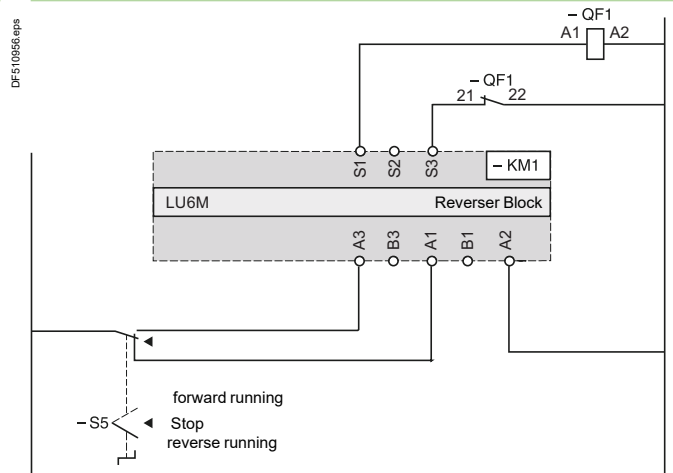
## Reversing starter-controllers LUB + LU6M



### 3-wire control, pulsed start with maintaining contact



### 2-wire control via 3-position switch



References:  
page A4/10



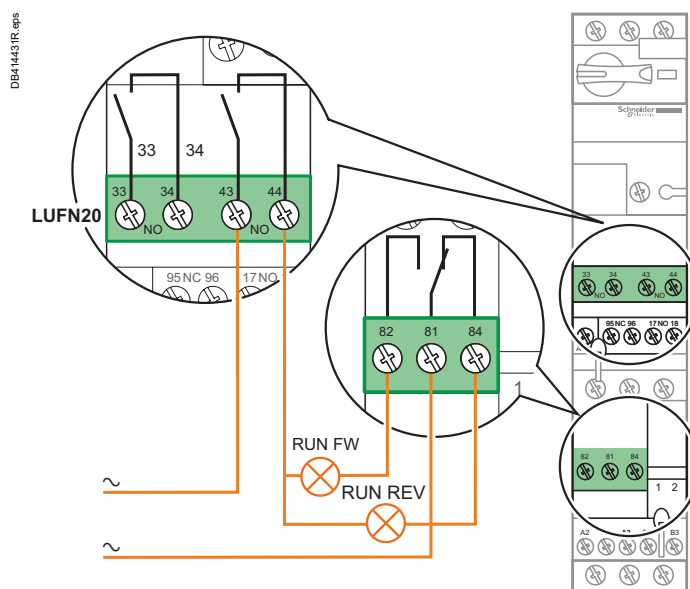
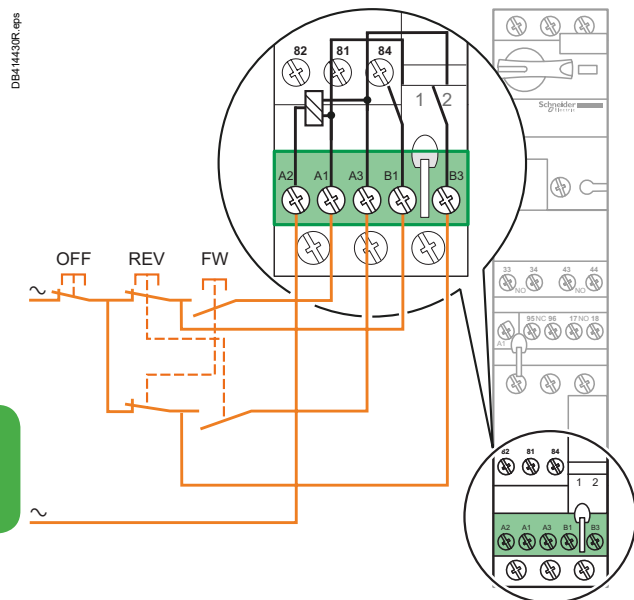
#### Power base with vertical mounting reverser block

##### FW/REV/OFF control (2 directions of rotation)

##### Push buttons wiring

##### FW/REV control

##### FW, REV indicators wiring





# TeSys

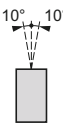
## Altistart U01 Soft starter

### Characteristics

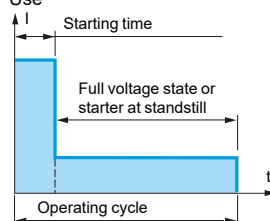
TeSys U

Ref.



Environmental characteristics		
<b>Type of starter</b>		<b>ATSU01N2●●LT</b>
Conformity to standards		Altistart U01 electronic starters have been developed to conform to the strictest international standards and the recommendations relating to electrical industrial control devices (IEC, EN), in particular standard IEC/EN 60947-4-2.
Electromagnetic compatibility EMC		
Conducted and radiated emissions		CISPR 11 level B, IEC 60947-4-2, level B
Harmonics		IEC 1000-3-2, IEC 1000-3-4
EMC immunity		EN 50082-2, EN 50082-1
Electrostatic discharge		IEC 61000-4-2 level 3
Immunity to radiated radio-electrical interference		IEC 61000-4-3 level 3
Immunity to electrical transients		IEC 61000-4-4 level 4
Voltage/current impulse		IEC 61000-4-5 level 3
Conducted and radiated emissions		IEC 61000-4-6 level 3
Immunity to conducted interference caused by radio-electrical fields		IEC 61000-4-11
Damped oscillating waves		IEC 61000-4-12 level 3
CE marking		The starters carry CE marking in accordance with the European low voltage directives IEC/EN 60947-4-2.
Product certifications		UL, CSA, C-Tick and CCC
Degree of protection		IP 20
Degree of pollution		2 conforming to IEC/EN 60947-4-2
Vibration resistance		1.5 mm peak to peak from 3 to 13 Hz, 1 gn from 13 to 150 Hz, conforming to IEC/EN 60068-2-6
Shock resistance		15 gn for 11 ms conforming to IEC/EN 60068-2-27
Relative humidity		5...95 % without condensation or dripping water conforming to IEC 60068-2-3
Ambient temperature around the unit	Storage	°C -25...+70 conforming to IEC/EN 60947-4-2
	Operation	°C -10...+40 without derating, up to 50°C with current derating of 2 % per °C above 40°C
Maximum operating altitude		m 1000 without derating (above this, derate the current by 2.2 % per additional 100 m)
Operating position		10° 10°
Maximum permanent angle in relation to the normal vertical mounting position		

Electrical characteristics		
<b>Type of starter</b>		<b>ATSU01N2●●LT</b>
Category of use	Conforming to IEC 60947-4-2	Ac-53b
Rated operating voltage	3-phase ~ voltage	V 200 - 10 % to 480 + 10 %
Frequency		Hz 50 - 5 % to 60 + 5 %
Output voltage		Maximum 3-phase voltage equal to line supply voltage
Control supply voltage		24 V ~, 100 mA ±10 %
Rated operating current		A 6...32
Adjustable starting time		s 1...10
Adjustable deceleration time		s 1...10
Starting torque		% 30... 80 % of DOL motor starting torque
<b>Type of starter</b>	<b>ATSU</b>	<b>01N206LT</b>   <b>01N209LT</b>   <b>01N212LT</b>   <b>01N222LT</b>   <b>01N232LT</b>
Control power supply consumption		24 V ~, 65 mA
Power dissipated	At full load at end of starting	W 1.5   1.5   1.5   2.5   2.5
	In transient state at 5 times the rated operating current	W 61.5   91.5   121.5   222.5   322.5
<b>Type of starter</b>		<b>ATSU01N206LT to ATSU01N222LT</b>   <b>ATSU01N232LT</b>
Use		
Starting time	Starting time	s 1   5   10   1   5   10
Full voltage state or starter at standstill	Maximum number of cycles per hour	100   20   10   50   10   5
Operating cycle		





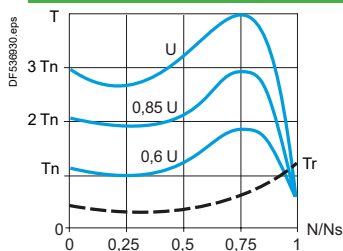
## Electrical characteristics (continued)

Logic input power supply (electrically isolated between power and control) + 24 V, COM		24 V $\pm 10\%$ Isolated Max. current 100 mA
Logic inputs LI1, LI2, BOOST Stop, run and boost on start-up functions		Logic inputs with impedance 27 k $\Omega$ ; 24 V power supply (U max 40 V) Max. current 8 mA State 0 if U < 5 V and I < 0.2 mA State 1 if U > 13 V and I > 0.5 mA
Logic output LO1 End of starting signal		Open collector logic output: External 24 V power supply (minimum 6 V, maximum 30 V) Max. current 200 mA
Relay output R1AR1C		Normally open (N/O) contact Minimum switching capacity: 10 mA for 6 V $\cdots$ Maximum switching capacity on inductive load ( $\cos \varphi = 0.5$ and L/R = 20 ms): 2 A for 250 V $\sim$ or 30 V $\cdots$ (AC-15) Maximum operating voltage 440 V
LED signalling	Green LED	Starter powered up
	Yellow LED	Nominal voltage reached

## Connections (maximum connection capacity and tightening torque)

Power circuit			Connection to $\varnothing 4$ mm screw clamps	
Flexible wire without cable end	1 conductor	mm <sup>2</sup>	1.5...10	8 AWG
	2 conductors	mm <sup>2</sup>	1.5...6	10 AWG
Flexible wire with cable end	1 conductor	mm <sup>2</sup>	1...6	10 AWG
	2 conductors	mm <sup>2</sup>	1...6	10 AWG
Rigid wire	1 conductor	mm <sup>2</sup>	1...10	8 AWG
	2 conductors	mm <sup>2</sup>	1...6	10 AWG
Tightening torque		N.m	1.9...2.5	
Control circuit			Screw connector	
Flexible wire without cable end	1 conductor	mm <sup>2</sup>	0.5...2.5	14 AWG
	2 conductors	mm <sup>2</sup>	0.5...1.5	16 AWG
Flexible wire with cable end	1 conductor	mm <sup>2</sup>	0.5...1.5	16 AWG
	2 conductors	mm <sup>2</sup>	0.5...1.5	16 AWG
Rigid wire	1 conductor	mm <sup>2</sup>	0.5...2.5	14 AWG
	2 conductors	mm <sup>2</sup>	0.5...1	17 AWG
Tightening torque		N.m	0.5	

## Torque characteristics (typical curves)



The diagram opposite shows the torque/speed characteristic of a cage motor in relation to the supply voltage.  
The torque varies in line with the square of the voltage at a fixed frequency. The gradual increase in the voltage prevents the instantaneous current peak on power-up.



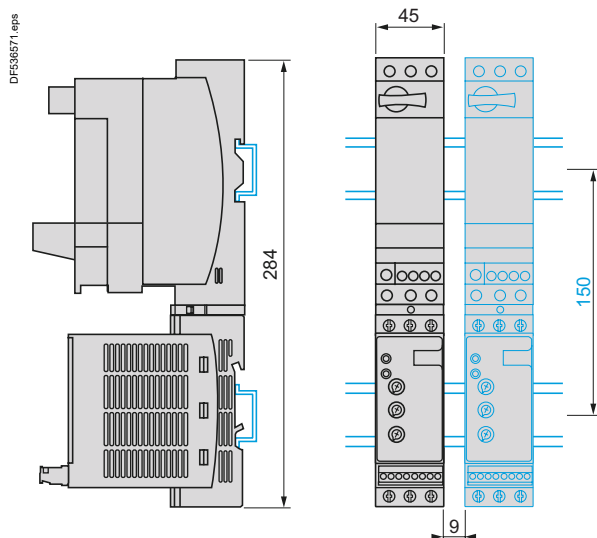
# TeSys

## Altistart U01 Soft starter

### Dimensions

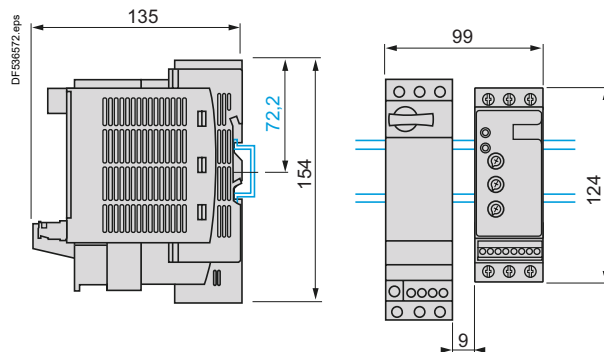
#### TeSys U combination (non-reversing power base) and ATSU01N206LT to ATSU01N212LT

Mounting on  $\sqcup$  (35 mm) rail with VW3G4104 connector



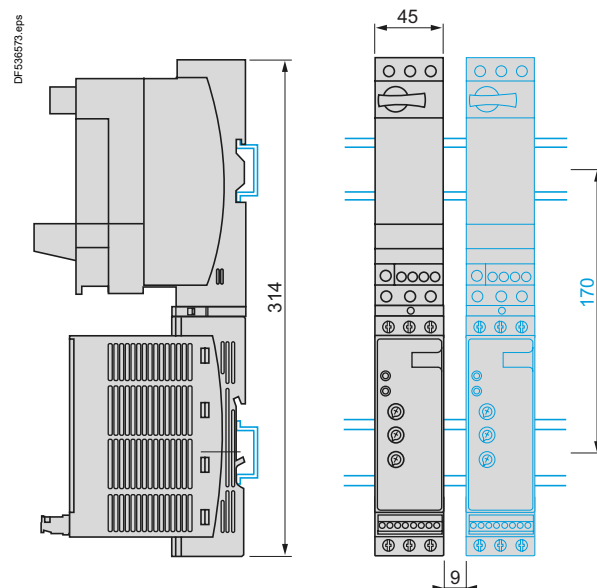
#### TeSys U combination (non-reversing or reversing power base) and ATSU01N206LT to ATSU01N212LT

Side by side mounting



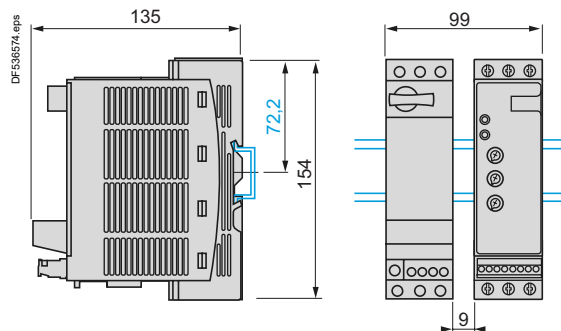
#### TeSys U combination (non-reversing power base) and ATSU01N222LT to ATSU01N232LT

Mounting on  $\sqcup$  (35 mm) rail with VW3G4104 connector

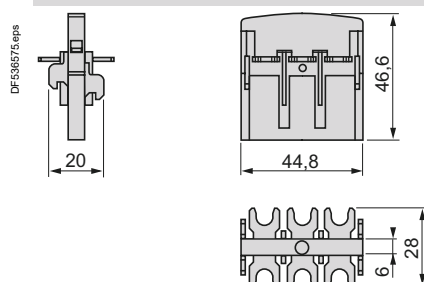


#### TeSys U combination (non-reversing or reversing power base) and ATSU01N222LT to ATSU01N232LT

Side by side mounting



#### VW3G4104 connector

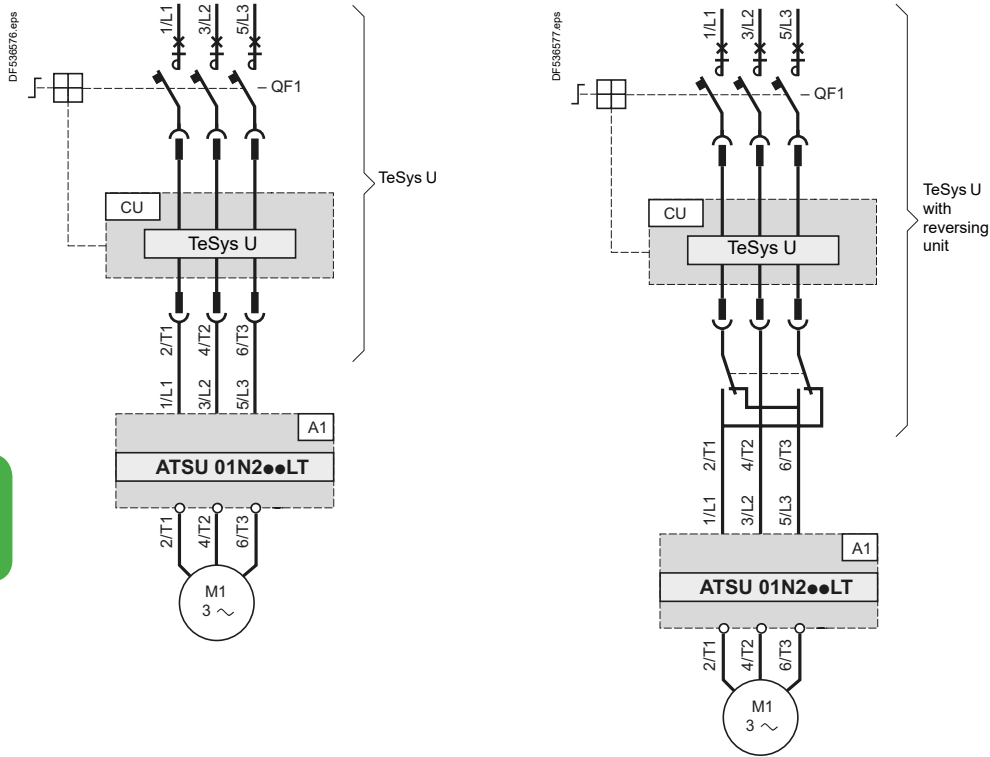




ATSU01N2●●LT soft start/soft stop units

Power wiring

Power wiring with reversing unit



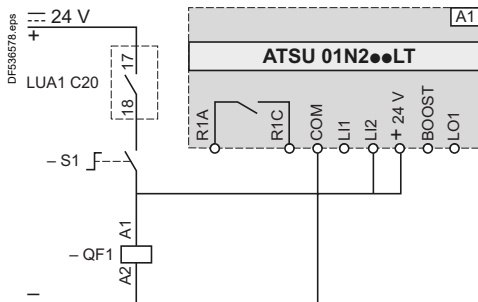
Compatible components	
Code	Description
A1	Soft start/soft stop unit
QF1	TeSys U controller-starter
CU	TeSys U control unit



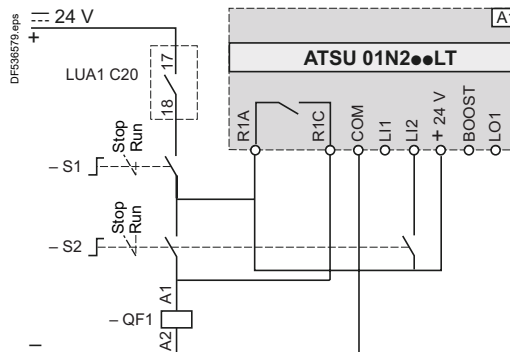
## ATSU01N2●●LT soft start/soft stop units (continued)

### Automatic 2-wire control

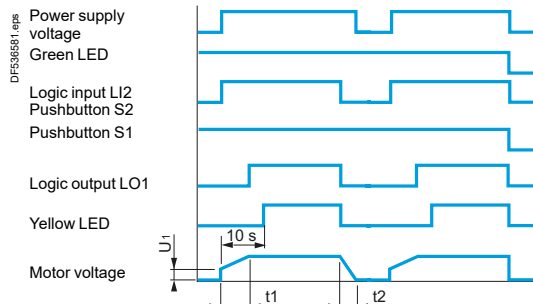
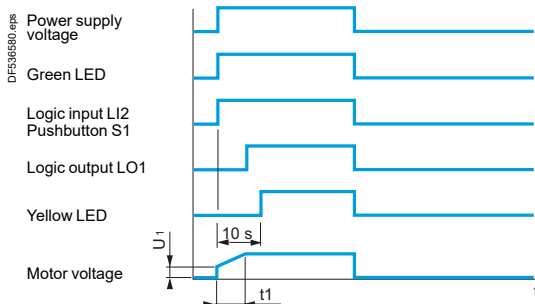
#### Without deceleration



#### With and without deceleration

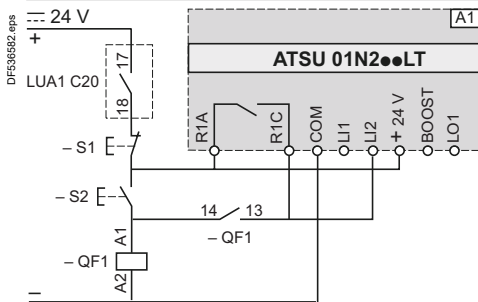


### Functional diagrams

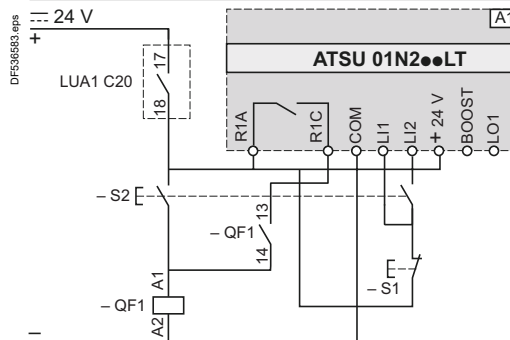


### Automatic 3-wire control

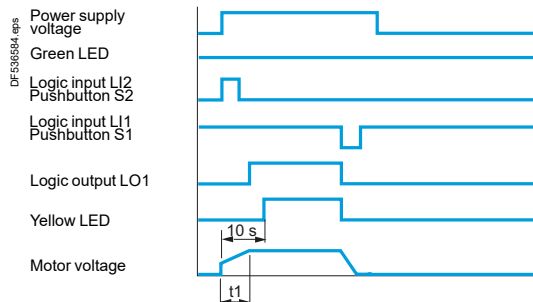
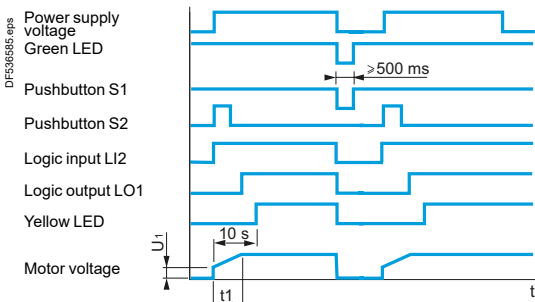
#### Without deceleration



#### With deceleration



### Functional diagrams



A1: Soft start/soft stop unit

S1, S2: XB4B or XB5B pushbuttons

QF1: TeSys U controller-starter

t1: Acceleration time can be controlled by a potentiometer

t2: Deceleration time can be controlled by a potentiometer

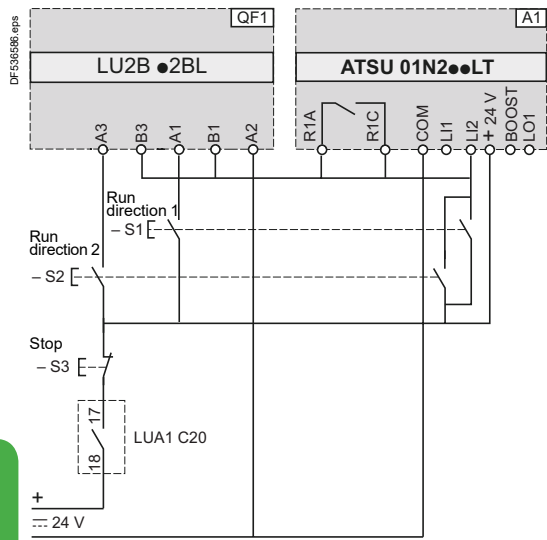
U<sub>1</sub>: Starting time can be controlled by a potentiometer



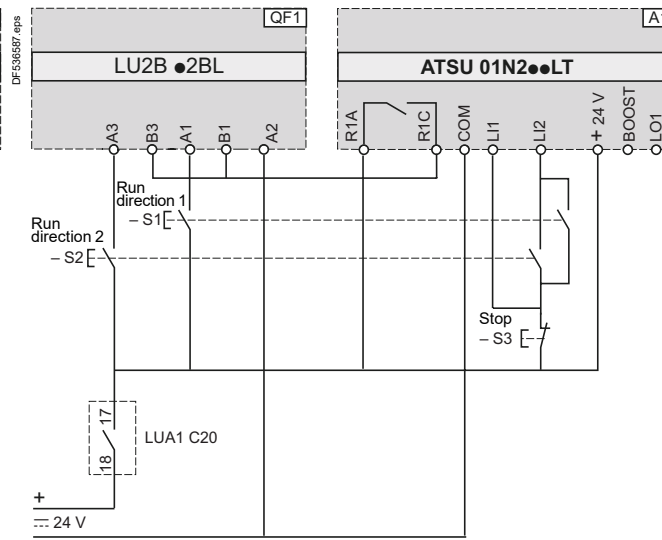
#### ATSU01N2●●LT soft start/soft stop units (continued)

##### Automatic 3-wire control, with reversing unit

###### Without deceleration



###### With deceleration



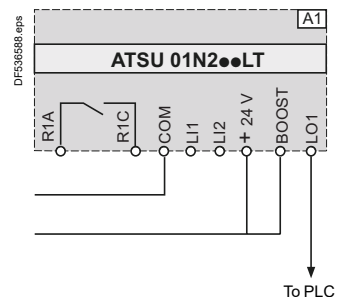
TeSys U

Ref.

QF1: TeSys U controller-starter with reversing unit  
A1: Soft start/soft stop unit  
S1, S2, S3: XB4B or XB5B pushbuttons  
S3: minimum depression time 500 ms

QF1: TeSys U controller-starter with reversing unit  
A1: Soft start/soft stop unit  
S1, S2, S3: XB4B or XB5B pushbuttons

##### Boost on starting and end of starting signal



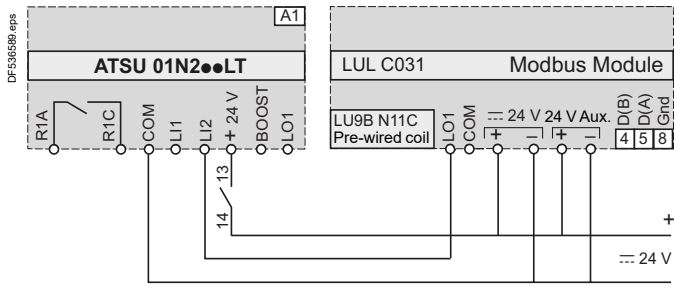
A1: Soft start/soft stop unit



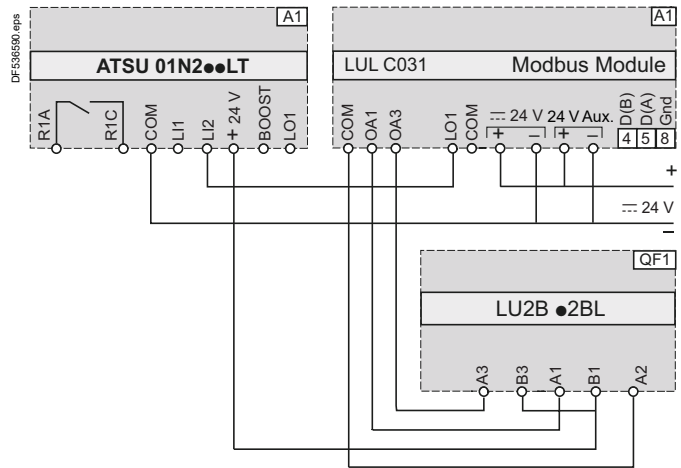
#### ATSU01N2●●LT soft start/soft stop units (continued)

##### Automatic control with Modbus communication module, with and without deceleration

###### Without reversing unit



###### With reversing unit



Function	Register	Bit	Value
<b>Powering down TeSys U and ATSU</b>			
—	704	0	0
<b>Automatic control without deceleration</b>			
Run	700	0	1
Stop	704	0	0
<b>Automatic control with deceleration</b>			
Run	700	0	1
Soft stop	700	0	0

A1: Soft start/soft stop unit

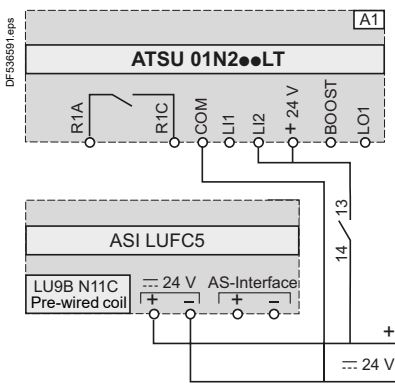
Function	Register	Bit	Value
<b>Powering up TeSys U and ATSU</b>			
Forward	704	0	1
Reverse	704	1	1
<b>Powering down TeSys U and ATSU</b>			
Forward	704	0	0
Reverse	704	1	0
<b>Automatic control without deceleration</b>			
Run	700	0	1
Stop forward	704	0	0
Stop reverse	704	1	0
<b>Automatic control with deceleration (forward or reverse)</b>			
Run	700	0	1
Soft stop	700	0	0

A1: Soft start/soft stop unit

QF1: TeSys U controller-starter with reversing unit

##### Automatic control with AS-Interface communication module, without deceleration

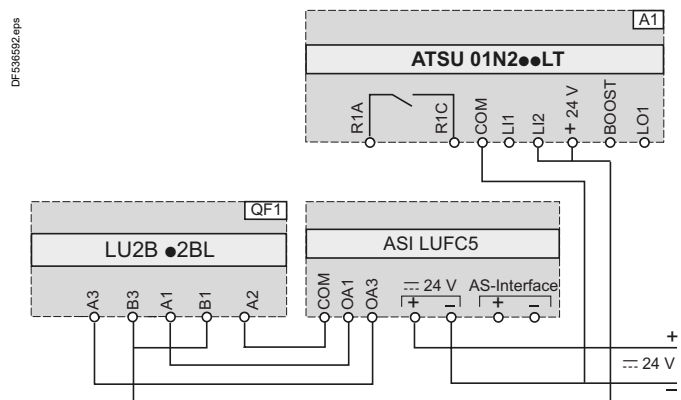
###### Without reversing unit



Function	Bit	Value
<b>Power-up and automatic control without deceleration</b>		
Run	D0	1
Stop	D0	0

A1: Soft start/soft stop unit

###### With reversing unit



Function	Bit	Value
<b>Power-up and automatic control without deceleration</b>		
Run forward	D0	1
Stop	D0	0
Run reverse	D1	1
Stop	D1	0

A1: Soft start/soft stop unit

QF1: TeSys U controller-starter with reversing unit









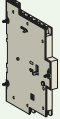




### TeSys Integral 63 All-in-one motor starter

**Page**

#### Introduction

A5/2

Type of product	Direct	Reversing	Range		
3 pole all-in-one motor starter	✓	✓	Up to 33 kW		
3 pole all-in-one motor starter for resistive loads – AC-1	✓		Up to 63 kW		
Add-on blocks					
Accessories and spare parts					

A5/4

A5/7

A5/8

A5/10

#### Technical Data for Designers

A5/17



# TeSys

## Integral 63 All-in-one motor starter

### Introduction



PB121271.eps

Ref.



PB121272.eps



Integral 63

### Integral 63: a high performance concept for reliability of operation

Integral 63 all-in-one motor starters combine all the functions of a power switching assembly up to 63 A in a single compact device, with performance equivalent to that of the best separate specialist devices.

They conform to the main standards currently in force, in particular IEC 60947-1, IEC 60947-2, IEC 60947-3, IEC 60947-4-1 and IEC 60947-6-2 (welding of power poles impossible), as well as to international approvals UL, CSA..., and the European directives.

The integral range ensures reliability of operation up to 63 A. In addition to safety of operation, integral has numerous other functions: increased protection, communication, remote control, fault identification, isolation, padlocking.

### Functions performed by Integral 63 units

**The equipment in a power switching circuit must perform 4 main functions:**

- power switching,
- isolation,
- overload protection,
- short-circuit protection.

These functions are traditionally performed by separate devices which must be combined to form a motor starter assembly, the most common being:

- fuses + contactor + thermal overload relay,
- circuit breaker + contactor + thermal overload relay.

### Power switching

#### Contactor (for automatic and remote control)

- Operational power for use in category AC-43:
  - up to 30 kW at 400/415 V 50 Hz,
  - up to 33 kW at 440/415 V 50 Hz.
- Electrical life in number of operating cycles, in category AC-43, at 415 V and at rated power: 1.2 million.
- Mechanical life in number of operating cycles: 5 million.

### Reversing pairs

- Two 3-pole contactors, horizontally mounted:
- mechanically interlocked.

Can be fitted with the same protection modules as Integral 63 all-in-one motor starter.



# TeSys

## Integral 63 All-in-one motor starter

### Introduction



#### Functions performed by Integral 63 units (continued)

##### Isolation

###### Isolation conforming to IEC 60947

Integral 63 all-in-one motor starters provide isolation and padlocking functions conforming to standards IEC 60947.

In addition, Integral 63 "LD4" all-in-one motor starters and "LD5" reversing all-in-one motor starters incorporate specific poles for control testing and padlocking.

##### Overload protection

###### Thermal-magnetic protection module (for protection against overload and overcurrent)

A range of interchangeable modules allows the equipment to be adapted to suit:

- the rated operational current (rating and settings),
- the application:
  - ☐ motors,
  - ☐ frequent starting motors,
  - ☐ distribution circuits.

##### Short-circuit protection

###### High breaking capacity current limiting circuit breaker

For short-circuit protection.

High breaking capacity with short-circuit limited by ultra-fast tripping.

Possibility of increasing the breaking capacity of the integral unit by adding a current limiter (**LA9LB920**).

The current limiter is fitted upstream of the integral unit.

Several integral units may be fitted downstream of the current limiter ( $I_{th} = 63 \text{ A}$ ,  $I_e = 32 \text{ A}$ ).

#### Signalling and attachments

These devices provide comprehensive local signalling:

- pole position indicator,
- different signalling for "overload" and "short-circuit".

They also allow dialogue with the automated control system by means of numerous add-on blocks:

- auxiliary contact and signalling blocks,
- remote electrical reset device,
- undervoltage and shunt trips,
- control circuit switching,
- etc.

#### Simple fixing and cabling methods

Integral 63 contractor breakers and reversing all-in-one motor starters fit onto 75 mm  $\hookrightarrow$  rails using a separate mounting plate.

Integral units can also be mounted on:

- panels,
- pre-slotted mounting plates type AM1 P,
- 2 x 35 mm  $\hookrightarrow$  rails using sliding clip nuts,
- CMD prefabricated plug-in busbar trunking (providing an economical assembly, combining safety and simplicity of use),
- AK5 panel busbar systems.





LD1LD030●

#### 3-pole power bases for AC-3 <sup>(1)</sup>

##### Without control test function, with padlocking facility

Standard power ratings of 3-phase motors 50/60 Hz in AC-43					Operational current	Breaking capacity (Iq) for Ue ≤ 415 V	Basic reference <sup>(3)</sup> To be completed by adding the control circuit voltage code <sup>(2)</sup>	Weight
220 V	400 V	240 V	415 V	440 V	500 V	660 V		
kW	kW	kW	kW	kW	A	kA		kg
Black knob								
15	30	33	37	55	63	50	LD1LD030●	3.700
	33							

##### With control test function and padlocking facility

Standard power ratings of 3-phase motors 50/60 Hz in AC-43					Operational current	Breaking capacity (Iq) for Ue ≤ 415 V	Basic reference <sup>(3)</sup> To be completed by adding the control circuit voltage code <sup>(2)</sup>	Weight
220 V	400 V	240 V	415 V	440 V	500 V	660 V		
kW	kW	kW	kW	kW	A	kA		kg
Black knob (CNOMO, VDE 0113)								
15	30	33	37	55	63	50	LD4LD130●	3.800
	33							

##### Red knob on yellow background (CNOMO) Emergency Stop

15	30	33	37	55	63	50	LD4LD030●	3.800
	33							

#### 3-pole reversing power bases <sup>(1)</sup>

##### With control test function and padlocking facility

Standard power ratings of 3-phase motors 50/60 Hz in AC-43					Operational current	Breaking capacity (Iq) for Ue ≤ 415 V	Basic reference <sup>(3)</sup> To be completed by adding the control circuit voltage code <sup>(2)</sup>	Weight
220 V	400 V	240 V	415 V	440 V	500 V	660 V		
kW	kW	kW	kW	kW	A	kA		kg
Black knob (CNOMO, VDE0113)								
15	30	33	37	55	63	50	LD5LD130●	7.600
	33							

##### Red knob on yellow background (CNOMO) Emergency Stop

15	30	33	37	55	63	50	LD5LD030●	7.600
	33							

<sup>(1)</sup> To be completed with a protection module (to be ordered separately).

<sup>(2)</sup> Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	36	42	48	110	120	220	230	240	380	415	440	480	500	600	660
50 Hz	B	–	D	E	F	–	M	M	U	Q	N	N	–	S	–	Y
60 Hz	BC	CC	–	CE	K	FC	LC	MC	MC	–	–	UX	Q	–	S	–
⋯ <sup>(4)</sup>	BD	–	–	ED	FD	–	–	–	–	–	–	–	–	–	–	–

<sup>(3)</sup> Variant: UL508 "type E" approved version (SPCD) at 347/600 V; to order, add suffix **H5** to the reference.

Example: **LD1LD030MH5**.

<sup>(4)</sup> For use on d.c., the unit is supplied with 1 or 2 converters, including coil suppression devices (2 converters for reversing all-in-one motor starters).

LD5LD130B





LB1LD03M●●

**Thermal-magnetic protection modules** (compensated and differential for normal starting motors) <sup>(1)</sup>
**Fixed magnetic protection, set at 15 Irth max, for mounting on Integral 63**

Standard power ratings of 3-phase motors 50/60 Hz in category AC-43					Thermal setting range (Irth min to Irth max)	Magnetic protection	Reference	Weight
220 V 240 V	400 V 415 V	440 V	480 V 525 V	600 V 690 V	A	A		kg
3	5.5	5.5	7.5	10	10...13	–	LB1LD03P16	0.780
4	9	9	11	15	13...18	–	LB1LD03P21	0.780
5.5	11	11	15	18.5	18...25	–	LB1LD03P22	0.780
7.5	15	15	18.5	22	23...32	–	LB1LD03P53	0.780
9	22	22	25	33	28...40	–	LB1LD03P55	0.780
11	25	25	33	45	35...50	–	LB1LD03P57	0.780
15	33	33	40	55	45...63	–	LB1LD03P61	0.780

**Adjustable magnetic protection from 6 to 12 Irth max, for mounting on Integral 63**

Standard power ratings of 3-phase motors 50/60 Hz in category AC-43					Thermal setting range (Irth min to Irth max)	Magnetic protection	Reference	Weight
220 V 240 V	400 V 415 V	440 V	480 V 525 V	600 V 690 V	A	A		kg
3	5.5	5.5	7.5	10	10...13	78...156	LB1LD03M16	0.780
4	9	9	11	15	13...18	108...216	LB1LD03M21	0.780
5.5	11	11	15	18.5	18...25	150...300	LB1LD03M22	0.780
7.5	22	22	25	33	23...32	190...380	LB1LD03M53	0.780
9	22	22	25	33	28...40	240...480	LB1LD03M55	0.780
11	25	25	33	45	35...50	300...600	LB1LD03M57	0.780
15	33	33	40	55	45...63	380...760	LB1LD03M61	0.780

**Magnetic only protection modules** (for frequent starting motors)

Standard power ratings of 3-phase motors 50/60 Hz in category AC-43					Magnetic protection	Reference	Weight
220 V 240 V	400 V 415 V	440 V	480 V 525 V	600 V 690 V	A		kg
3	5.5	5.5	7.5	10	78...156	LB6LD03M16	0.780
4	9	9	11	15	108...216	LB6LD03M21	0.780
5.5	11	11	15	18.5	150...300	LB6LD03M22	0.780
7.5	22	22	25	33	190...380	LB6LD03M53	0.780
9	22	22	25	33	240...480	LB6LD03M55	0.780
11	25	25	33	45	300...600	LB6LD03M57	0.780
15	33	33	40	55	380...760	LB6LD03M61	0.780

<sup>(1)</sup> Protection modules UL and CSA approved.


LB6LD03M●●





PB121271.eps

LD1LD030●



PB121273.eps

LB1LD03L●●

### 3-pole power bases for AC-1 <sup>(1)</sup>

#### Without control test function, with padlocking facility

Rated thermal current I <sub>th</sub> θ ≤ 40 °C	Maximum operational current AC-1 θ ≤ 40 °C	Maximum operational voltage	Breaking capacity (I <sub>q</sub> ) for U <sub>e</sub> ≤ 415 V	Number of poles	Basic reference. To be completed by adding the control voltage code <sup>(2)</sup>	Weight
A	A	V	kA			kg

#### Black knob

63	63	690	50	3	LD1LD030●	3.700
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#### With control test function and padlocking facility

Rated thermal current I <sub>th</sub> θ ≤ 40 °C	Maximum operational current AC-1 θ ≤ 40 °C	Maximum operational voltage	Breaking capacity (I <sub>q</sub> ) for U <sub>e</sub> ≤ 415 V	Number of poles	Basic reference. To be completed by adding the control voltage code <sup>(2)</sup>	Weight
A	A	V	kA			kg

#### Black knob (CNOMO. VDE0113)

63	63	690	50	3	LD4LD130●	3.800
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#### Red knob on yellow background (CNOMO. VDE0113) Emergency Stop

63	63	690	50	3	LD4LD030●	3.800
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### Protection modules (for customer assembly)

#### Thermal-magnetic (compensated)

Thermal setting range (I <sub>rt</sub> h min./I <sub>rt</sub> h max.)	Magnetic setting range (3...6 I <sub>rt</sub> h max)	Number of poles	Number of protected poles	Reference	Weight
A	A				kg
10...13	39...78	3	3	LB1LD03L16	0.780
13...18	54...108	3	3	LB1LD03L21	0.780
18...25	75...150	3	3	LB1LD03L22	0.780
23...32	95...190	3	3	LB1LD03L53	0.780
28...40	120...240	3	3	LB1LD03L55	0.780
35...50	150...300	3	3	LB1LD03L57	0.780
45...63	190...380	3	3	LB1LD03L61	0.780

(1) To be completed with a protection module (to be ordered separately).

(2) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	24	36	42	48	110	120	220	230	240	380 400	415	440	480	500	600	660
50 Hz	B	—	D	E	F	—	M	M	U	Q	N	N	—	S	—	Y
60 Hz	BC	CC	—	CE	K	FC	LC	MC	MC	—	—	UX	Q	—	S	—
— <sup>(3)</sup>	BD	—	—	ED	FD	—	—	—	—	—	—	—	—	—	—	—

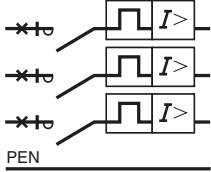


(3) For use on d.c., the unit is supplied with a converter, including coil suppression device.






TeSys

Integral 63 All-in-one motor starter for AC-1 applications

Product references

Selection of all-in-one starter and protection module for AC-1			
Earthing system	Type of circuit	Equipment scheme	Product combinations
TNC (Neutral and PE are combined)	3-pole + PEN		LD1LD030● + LB1LD03L●●
			LD4LD130● + LB1LD03L●●
			LD4LD030● + LB1LD03L●●
		PEN	

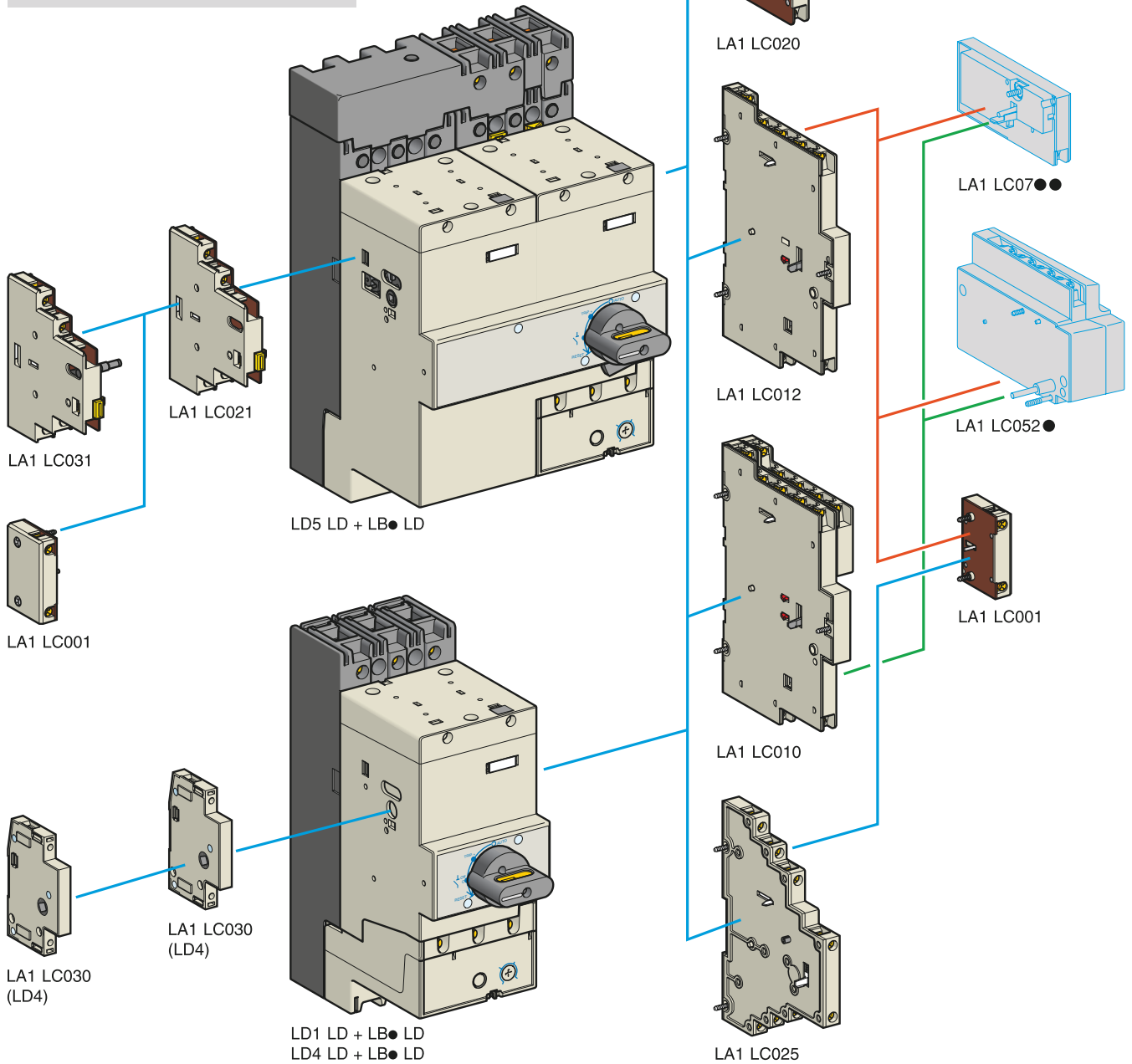
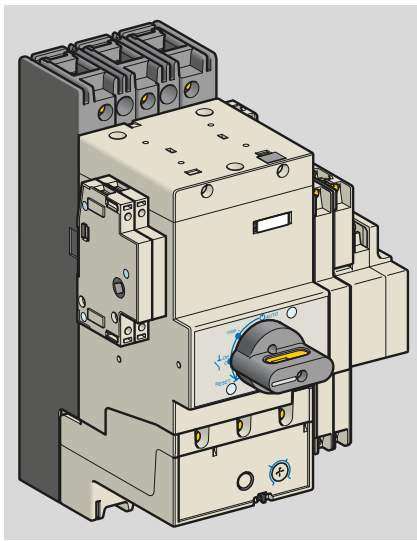
**Note:** the PEN conductor must not be isolated.

Earthing system	Type of circuit	Equipment scheme	Product references
TNS (Neutral and PE are separated)	3-pole		LD1LD030● + LB1LD03L●●
			LD4LD130● + LB1LD03L●●
			LD4LD030● + LB1LD03L●●

**Note:** all live conductors must be isolated. Neutral protection optional.












Instantaneous auxiliary contact blocks (IP 20) <sup>(1)</sup>

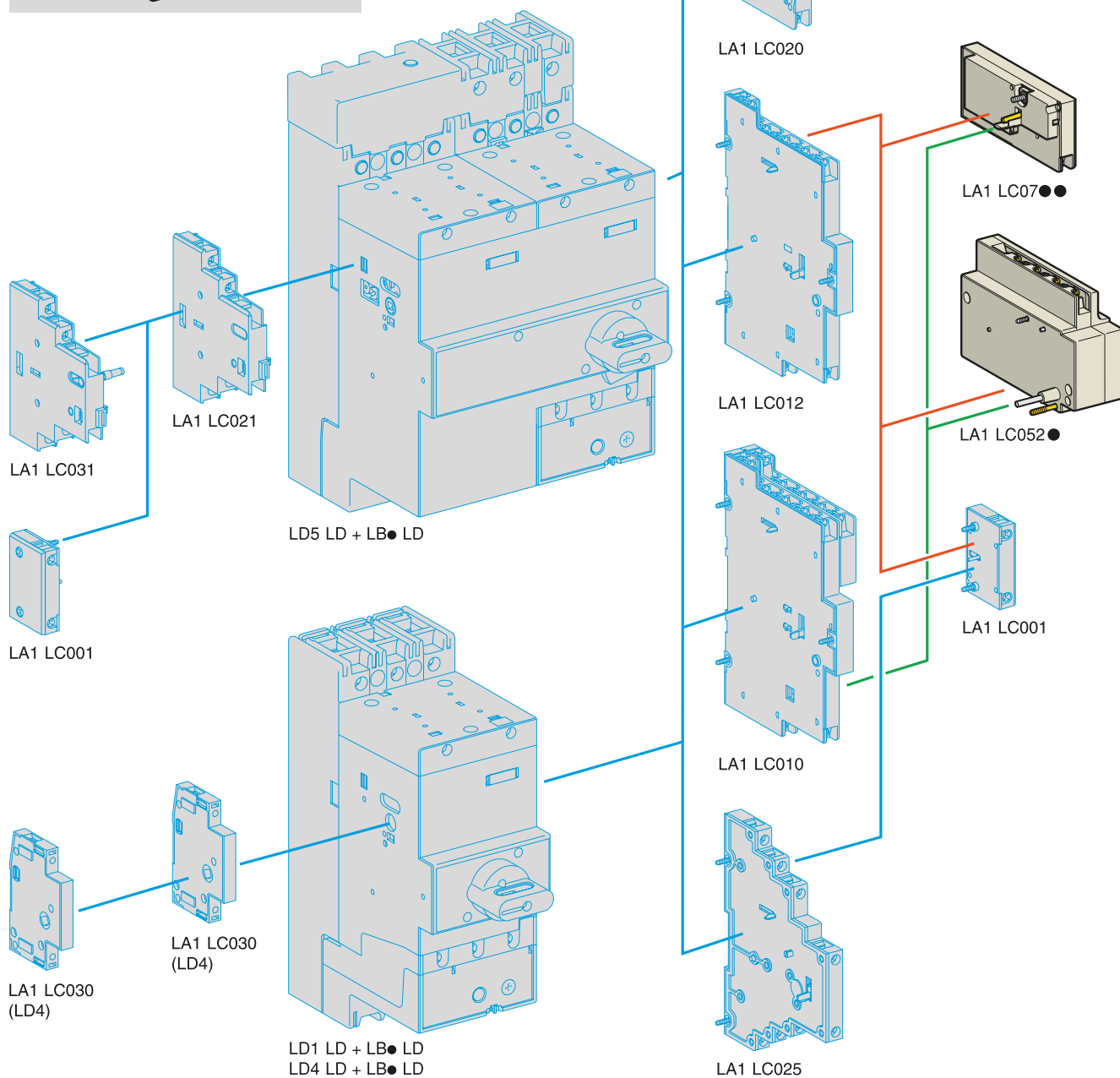
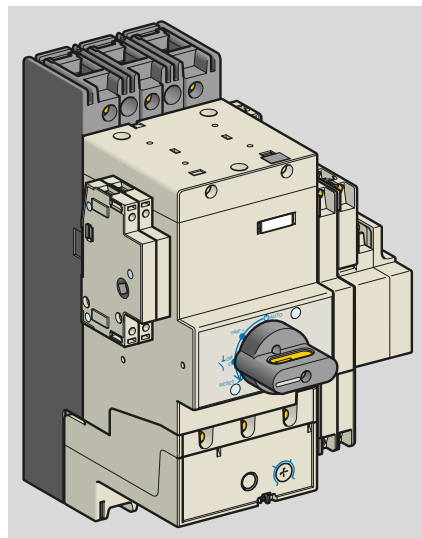
For use on	Type and number of blocks per unit	Composition			Reference
					
		N/O	N/C	C/O	
LD1D, LD4 or L5	1 block of 6 contacts comprising:	2	1	–	LA1LC010
Mounted on RH side	■ 3 signalling contacts “contactor state”	–	–	1	
	■ 1 signalling contact “control knob in any position other than Auto”	–	–	1	
	■ 1 signalling contact tripped on short-circuit				
	■ 1 signalling contact “tripped”	–	–	1	
	1 block of 5 contacts comprising:	2	1	–	LA1LC012
	■ 3 signalling contacts “contactor state”	1	–	–	
	■ 1 signalling contact tripped on short-circuit	1	–	–	
	■ 1 signalling contact “tripped”				
	1 block of 4 contacts comprising:	2	1	–	LA1LC025
	■ 3 signalling contacts “contactor state”	1	1	–	
	■ 1 signalling contact “tripped”, selectable by the user				
	1 block of 3 signalling contacts “contactor state”	2	1	–	LA1LC020
LD4	1 control circuit isolating block (1 or 2 blocks per unit)	1	–	–	LA1LC030
Mounted on LH side					
LD5	1 block of 3 signalling contacts “contactor state”	2	1	–	LA1LB021
Mounted on LH side					
	1 control circuit isolating block comprising 2 contacts	2	–	–	LA1LC031

Signalling contact block (IP 10) <sup>(1)</sup>

For use on	Type and number of blocks per unit	Composition			Reference
		N/O	N/C	C/O	
LD1, LD4 or LD5	1 block comprising 1 signalling contact “contactor state” Mounted on LH or RH side	–	1	–	LA1LC001

(1) UL and CSA approved.



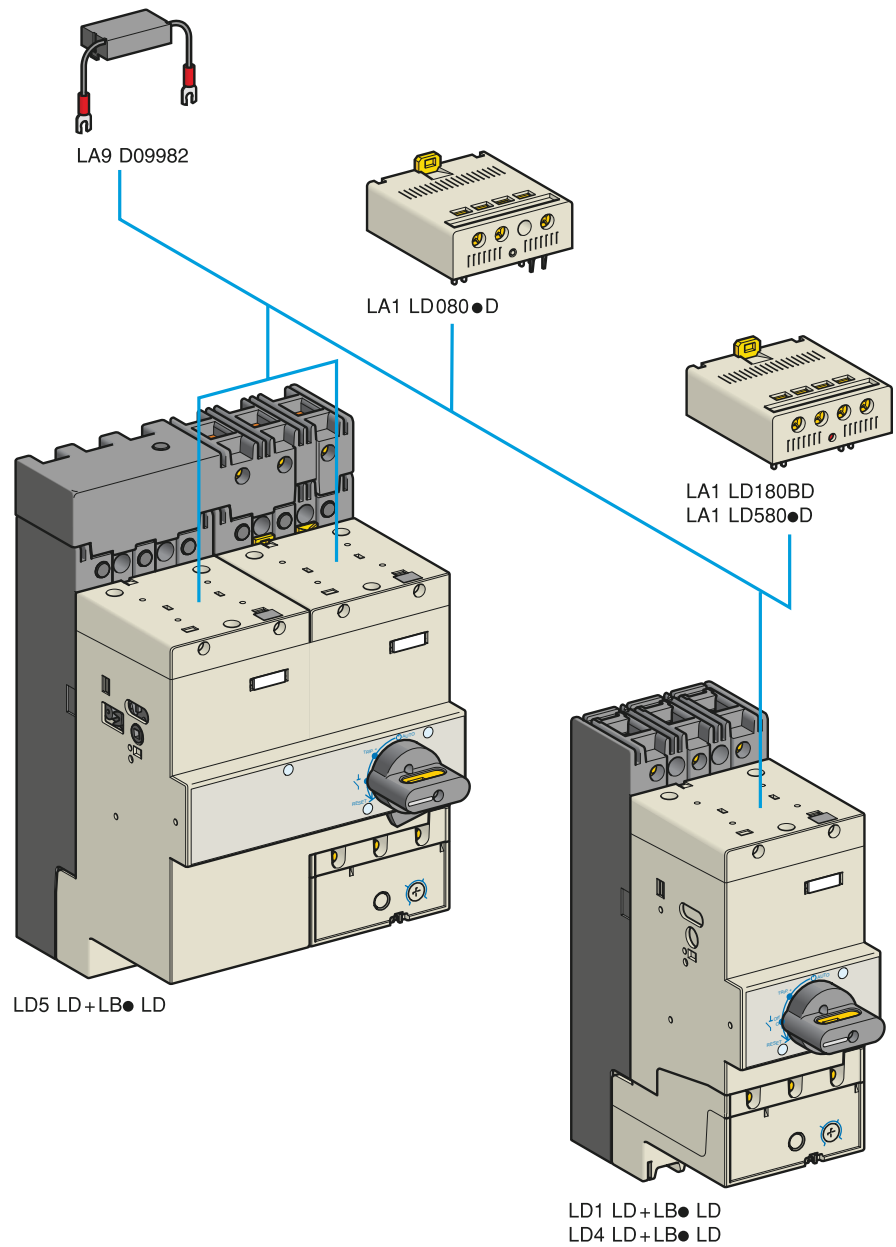
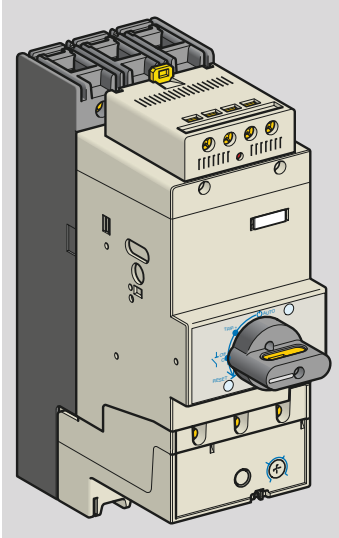




Electrical tripping and reset devices									
For use on	Type and number of devices per unit	Basic reference. To be completed by adding the control voltage code <sup>(1)</sup>							
LD1, LD4 or LD5 fitted with an LA1LC010 or LA1LC012 block	1 undervoltage trip	Time delay 0.2 s	LA1LC070●						
		Instantaneous	LA1LC072●						
	or 1 shunt trip	Instantaneous	LA1LC071●						
LD1, LD4 or LD5 fitted with an LA1LC010 or LA1LC012 add-on block	1 remote electrical reset device	24 V 50/60 Hz	LA1LC052B						
		42 V 50 Hz 48 V 50/60 Hz	LA1LC052E						
		100/127 V 50/60 Hz	LA1LC052F						
		200/240 V 50/60 Hz	LA1LC052M						
(1) Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):									
Volts	24	48	110	120	220/230	240	380/400	415	440
50 Hz	B	E	F	—	M	U	Q	N	N
60 Hz	B	E	F	F	M	M	Q	—	N









Interface modules for coil control by a programmable Logic controller <sup>(1)</sup>				
Mounting	Type	Input control voltage ---	Output operational voltage 50/60 Hz	Reference
On top of the power base	Solid state	V	V	
		5...24	24...240	LA1LD180BD
	Relay output	24	24...240	LA1LD580BD
		48	24...240	LA1LD580ED

### Voltage converters for d.c. control by a PLC

Each converter is dedicated to a specific coil.

The d.c. coil and its voltage converter are automatically delivered with every d.c. power base.

Input voltage ---	Consumption (Inrush)	Consumption (Sealed)	Reference
V	W	W	
24	300	8	LA1LD080BD
48	300	8	LA1LD080ED
110	300	8	LA1LD080FD

### Suppressor module

Mounting	Type	Operational voltage 50/60 Hz	Reference
		V	
Clip-on	RC circuit (Resistor-Capacitor) <sup>(2)</sup>	≤ 250	LA9D09982

<sup>(1)</sup> For reversing all-in-one motor starters, order 2 interface modules or 2 voltage converters.

<sup>(2)</sup> An RC circuit provides effective protection for circuits highly sensitive to high frequency interference.  
Voltage limited to 3 U<sub>c</sub> max. and oscillating frequency limited to 400 Hz max.  
Slight increase in drop-out time (1.2 to 2 times the normal time).



PB121274.eps



LA1LC090

PB121275.eps



LA9LD010



#### Protection accessories

Description	For use on	Sold in lots of	Unit reference
Power terminal protection shroud	Upstream power terminals (L1, L2, L3)	5	LA9LD701
Sealing cover	Protection module	1	LA1LC090

#### Mounting accessories

Description	For use on	Mounting on	Reference
Mounting plate	LD1, LD4, LD5	1 x 75 mm └ rail or 2 x 32 mm └ rails	LA9LD010

#### Door interlock mechanisms (IP 54)

Type	For use on	Colour of knob	Unit reference
Adjustable from 0 to 185 mm with extension (control knob mounted on plate or door)	LD1	Red	LA9LC330
		Black	LA9LC331
	LD4, LD5	Red	LA9LC530
		Black	LA9LC531



PS 12/276 eps



LX1LD...

### Replacement a.c. coils

Rated control circuit voltages		Average resistance at 20 °C ±10 %	Inductance of closed circuit	Voltage code <sup>(1)</sup>	Reference
Uc 50 Hz	Uc 60 Hz				
V	V	Ω	H		
–	24	0.213	0.045	BC	LX1LD020
24	–	0.323	0.071	B	LX1LD024
–	36	0.503	0.106	CC	LX1LD030
–	48	0.845	0.19	CE	LX1LD040
42	–	0.987	0.22	D	LX1LD042
48	–	1.26	0.29	E	LX1LD048
–	110	4.88	1	K	LX1LD090
–	115/120	5.89	1.18	FC	LX1LD100
110	–	6.48	1.48	F	LX1LD110
127	–	9.80	2.13	G	LX1LD127
–	220	19.82	4.2	LC	LX1LD180
–	230/240	23.24	4.5	MC	LX1LD190
220/230	–	30.51	6.7	M	LX1LD220
240	–	37.66	7.9	U	LX1LD240
–	440	80.46	16.7	UX	LX1LD360
380/400	460/480	93.63	20	Q	LX1LD380
415/440	–	116.46	23.7	N	LX1LD415
500	575/600	152.18	31	S	LX1LD500
660	–	290.80	60	Y	LX1LD660

Consumption at 50 Hz: inrush (cos φ: 0.55) 350 to 400 VA; sealed (cos φ: 0.28) 20 to 30 VA.

Consumption at 60 Hz: inrush (cos φ: 0.55) 420 to 500 VA; sealed (cos φ: 0.30) 24 to 36 VA.

<sup>(1)</sup> Coil voltage code, used to complete the power base basic reference.

### Replacement d.c. coils and associated voltage converters <sup>(2)</sup>

Mounting	For use on power base ref.	Input operational voltage <sup>(3)</sup>	Consumption		Description	Reference <sup>(4)</sup>
			Inrush	Sealed		
		V	W	W		
On top of power base	LD●LD●●●BD	24	300	8	Coil	LX1LD0249
					Converter	LA1LD080BD
	LD●LD●●●ED	48 <sup>(5)</sup>	300	8	Coil	LX1LD0489
					Converter	LA1LD080ED
	LD●LD●●●FD	110	300	8	Coil	LX1LD01109
					Converter	LA1LD080FD

<sup>(2)</sup> For reversing all-in-one motor starters, order 2 interface modules or 2 voltage converters.

<sup>(3)</sup> When used on rectified single-phase or 3-phase supply, the peak to peak ripple voltage must be equal to or less than 0.14 of the average voltage.

Operating limits 0.8 to 1.1 Uc for an ambient temperature ≤ 40 °C.

<sup>(4)</sup> It is essential that the voltage converter be associated with the specific coil indicated.

<sup>(5)</sup> 24 V and 48 V converters can be operated by "Low level input". In this case, the control circuit voltage must be the same as the supply voltage (24 or 48 V).







## Technical Data for Designers

### Contents

Introduction .....	A5/18 to A5/21
Characteristics .....	A5/22 to A5/27
Curves .....	A5/28 to A5/31
Operating status indication .....	A5/32 and A5/33
Dimensions, mounting .....	A5/34 and A5/35
Schemes .....	A5/36 and A5/37
Terminology .....	A5/38 to A5/41



When designing an installation, it is essential to take into account precise criteria for determining the conductor c.s.a. and selecting equipment.

In particular:

- permissible currents for the conductors,
- maximum voltage drops,
- short-circuit protection,
- protection against indirect contact.

The latter three criteria must be taken into account when selecting the integral unit.

The principle behind the rules described below is, on the whole, common to all European publications. However, the calculations and values concerning protection against indirect contact are based on French standard NF C 15-100, and it is up to the user to check the regulations in force in the country concerned.

#### Cable protection against overload

To achieve this, the thermal setting value  $I_{rth}$  selected must be greater than the current drawn  $I_B$  and less than or equal to the permissible current  $I_z$  in the cable to be protected.

$$I_B < I_{rth} \leq I_z$$

#### Short-circuit protection

##### Breaking capacity rule

Check that the breaking capacity (BC) of the integral unit is equal to or greater than the prospective short-circuit current ( $I_{sc \max}$ ) at the point where it is to be installed.

$$BC \geq I_{sc \max}$$

##### Breaking time rule

2 conditions must be fulfilled:

- The short-circuit current at the end of the circuit,  $I_{sc \min}$ , must be greater than or equal to the minimum current required for magnetic tripping of the device,
- The short-circuit current at the start of the circuit,  $I_{sc \max}$ , must be such that:

$$I_{sc \max}^2 t_m \leq I_o^2 t_o$$

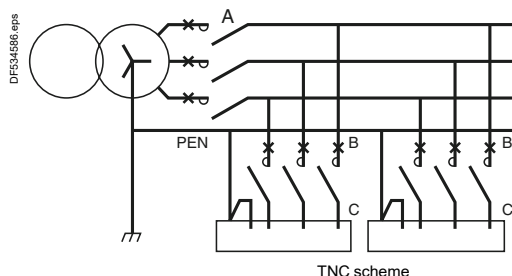
$I_o^2 t_o$  = permissible thermal stress limit for the circuit,  
 $t_m$  = operating time of the integral unit or of the short-circuit protection device.

These 2 checks need only be made when modules with a low rating are used.

**Example:** for a 6.3/10 A module, a cable c.s.a.  $\geq 2.5 \text{ mm}^2$  is required to withstand  $I_{sc \max} = 50 \text{ kA}$ .

#### Protection against indirect contact in TN schemes

##### TN multiple earthed neutral scheme



- Neutral is connected to earth.
- The earths are connected to neutral.
- Any phase/earth insulation fault causes a short-circuit.
- As contact voltage is dangerous, breaking must occur at the first fault.
- The PE conductor and the neutral conductor may be:
  - ☐ combined (TNC scheme),
  - ☐ separate (TNS scheme).



## Protection against indirect contact in TN schemes

- Protection against indirect contact (TN schemes), for dead shorts only, requires that the following 2 conditions be fulfilled simultaneously:
  - the fault current  $I_d$  must be greater than or equal to the minimum current required for magnetic tripping of the integral unit, i.e.  $1.12 \mu I_{rth \max}$ .

$$I_d = c \cdot q \cdot \frac{U_0}{Z_b}$$

$c$  = coefficient taking into account the upstream part of the fault loop impedance assumed to be equal to 0.8, unless otherwise indicated.

$q$  = coefficient dependent on the earth connection scheme and equal to 1 in the TN scheme.

$U_0$  = phase-neutral voltage in volts.

$Z_b$  = fault loop impedance in  $m\Omega/m$  such that:

$Z_b \neq R$  (fault loop resistance).

$L$  = length of the fault loop equal to twice the length  $L_c$  of the circuit.

$S$  = Sph, c.s.a of the phase conductors =  $S_{PE}$  = c.s.a. of the protective conductors.

$\rho$  = resistivity of the copper = 0.0225.

$\mu$  = ratio between the magnetic tripping current and the maximum setting current of the instantaneous thermal tripping device.

- the contact voltage ( $U_L$ ) for a dead short is at most equal to the value determined by the safety curve for the operating time  $t_m$  of the integral unit in its magnetic tripping zone.

This condition is generally fulfilled for power supplies of 230/415 V.

(In fact, for  $U_L = 50$  V, a  $t_m \leq 500$  ms would be required and for  $U_L = 25$  V, a  $t_m \leq 110$  ms would be required).

The first condition allows us to calculate the maximum length of the circuit to provide protection against indirect contact in the TN scheme.

For the TN scheme:

$$L \leq \frac{c \cdot q \cdot U_0 \cdot S_{ph}}{2 \rho \cdot 1 \cdot \mu I_{rth}}$$

$$\text{i.e. } L_{\max} = \frac{0.8 \times U_0 \times S_{ph}}{2 \times 0.0225 \times 1.2 \mu I_{rth \max}}$$

## Maximum length of 230/415 V circuits with TN scheme

C.s.a.	$I_{rth \max}$	$\mu = 3$	$\mu = 6$	$\mu = 12$	$\mu = 15$
mm <sup>2</sup>	A	m	m	m	m
1.5	10	180	90	45	36
	16	112	56	28	22
2.5	10	298	149	75	60
	16	186	93	47	37
	25	118	59	32	—
	32	92	46	23	—
4	16	296	148	74	60
	25	190	95	48	—
	32	148	74	37	—
	40	118	59	30	—
6	25	284	142	71	—
	32	222	111	56	—
	40	178	89	45	—
	50	142	71	36	—
10	32	370	185	93	—
	40	296	148	74	—
	50	236	118	59	—
	63	188	94	47	—
16	32	590	295	148	—
	40	472	236	118	—
	50	378	189	95	—
	63	300	150	75	—
25	32	922	461	281	—
	40	738	369	185	—
	50	590	295	148	—
	63	468	234	117	—



#### Selection for a temperature $\theta \leq 40^\circ\text{C}$

Rated operational voltage	V	220/240	400/415	440	480/525	600/690
Rated operational currents (according to the rated operational voltage)						
Integral 63	A	63	63	63	63	63

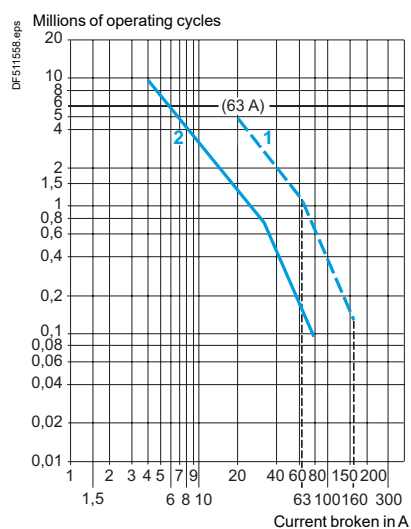
#### Rated operational powers (for standard motors)

Integral 63	kW	15	33	33	37	55
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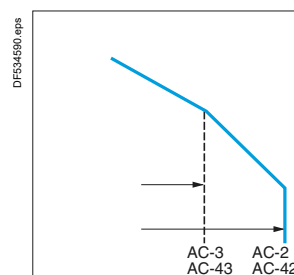
#### Electrical durability

##### Control and protection of motors at $U_e \leq 415\text{ V}$

- in utilisation categories AC2, AC3 conforming to IEC 60947-4-1,
- in utilisation categories AC2, AC3 conforming to IEC 60947-6-2.



- 1 Not having previously broken a short-circuit current
- 2 Having broken a short-circuit current 10 times at  $30 I_e$  (most common values of short-circuit current during operation)





#### a.c. supply, utilisation categories AC-1, AC-3, AC-41, AC-43

##### Rated operational currents (according to ambient temperature)

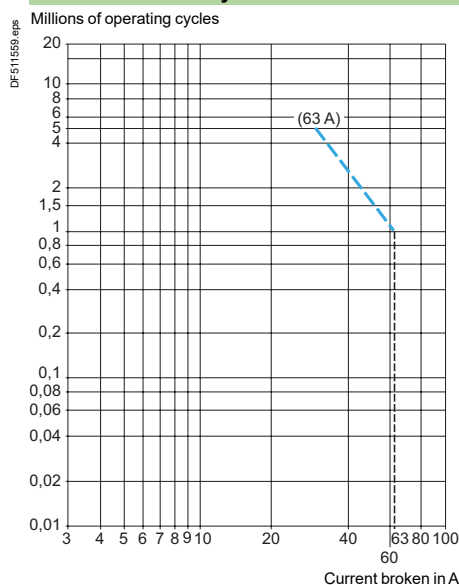
	With cable c.s.a.	A	$\theta \leq 40\text{ °C}$	$\theta \leq 55\text{ °C}$	$\theta \leq 70\text{ °C}$
Integral 63	16 mm <sup>2</sup>	A	63	55	50

#### a.c. supply, utilisation categories AC-1, AC-41

##### Maximum operating rates in operating cycles/hour

		On-load factor 85 %		On-load factor 25 %
		Operation at $I_e$ max	Operation at 0.5 $I_e$	Operation at $I_e$ max
Integral 63	Operating cycles/h	1200	2400	1800

#### Electrical durability $U_e \leq 415\text{ V}$



**Note:** for use in category AC-44, please consult your Regional Sales Office.



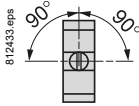
# TeSys

## Integral 63 All-in-one motor starter

### Characteristics

Type		Integral 63
Number of poles		3
Rated operational current (Ie)	In AC-3	<b>A</b> 63
Rated operational voltage (Ue)		<b>V</b> 690
Electrical durability	In AC-3 at 400 V	1.2 million operating cycles
Mechanical durability at Uc		5 million operating cycles
Maximum operating rate	~	3600 operating cycles/hour
at ambient temperature ≤ 55 °C	--- with converter	600 operating cycles/hour

### Environment

Conforming to standards		IEC: 158-1, 204-1, 204-2, 364, 947-1/2 and 4 UTE: NF C 63-110, C 63-120, C 63-130, C 63-650, C 79-100, C 20-040 VDE: 0100, 0110, 0113, 0170, 0171, 471, 0660 BS: 5424, 4752, 4941 NEN, NBN
Product certifications		ASE, ASEFA, ASTA, BV, CSA, DEMKO, DNV, GL NEMKO, NKK, ÖVE, RINA, SCC, SETI, UL, USSR, LROS
Protective treatment		"TH"
Ambient air temperature around the device	~ Operation	°C -20...+60
	Storage	°C -40...+80
	--- (1) Operation	°C -25...+50
	Storage	°C -25...+70
Vibration resistance	5...100 Hz	Energised state: 3 gn De-energised state: 3 gn
Shock resistance	Impulse duration: 11 ms	Energised state: 8 gn De-energised state: 8 gn
Degree of protection	Conforming to IEC 60144 & 60529	IP 20B
	Conforming to VDE 0106	Protection against direct finger contact
Flame resistance		Conforming to IEC 60295-2-1, NF C 20-455 and decree of 22-12-81 (JO 27 NC of 1 <sup>st</sup> and 2/2/1982) Conforming to UL 94 - V0 and NF T 51-072
Maximum operating altitude	Without derating	<b>m</b> 3000
Operating positions (without derating)	In relation to normal vertical mounting plane	From main axis (left-right tilt) 

### Control circuit characteristics

Rated control circuit voltage (Uc)	~ 50 Hz	<b>V</b> 24...660
	~ 60 Hz	<b>V</b> 24...600
	--- with converter	<b>V</b> 24, 48, 110
Voltage limits at θ ≤ 55 °C	Operation	0.85...1.1 Uc
	Drop-out	0.25...0.7 Uc
Average consumption at 20 °C and at Uc	~ Inrush	<b>VA</b> 375 (50 Hz), 450 (60 Hz)
	Sealed	<b>VA</b> 25 (50 Hz or 60 Hz)
	--- (1) Inrush	<b>W</b> 300 for 50 ms
	Sealed	<b>W</b> 8
Heat dissipation		<b>W</b> 8 (50 Hz), 11 (60 Hz)
Operating time (2)	~ 50/60 Hz "C"	<b>ms</b> 12...35
at 20 °C and at Uc	"O"	<b>ms</b> 7...20
	--- with converter "C"	<b>ms</b> 25...40
	"O"	<b>ms</b> 15...25

(1) With converter.

(2) The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles.

The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.



# TeSys

## Integral 63 All-in-one motor starter

### Characteristics

Pole characteristics								
Type			Integral 63					
Conventional thermal current (I <sub>th</sub> )	θ ≤ 40 °C	A	63					
Frequency limits of the operational current		Hz	40...60					
Rated impulse withstand voltage (U <sub>imp</sub> )	Conforming to IEC 60947-4	kV	8					
Rated insulation voltage (U <sub>i</sub> )	Conforming to IEC 60947-1	V	690					
Heat dissipation in the power circuits of the all-in-one motor starter and its protection module	Operational current	A	25	32	40	50	63	
	Power per pole, hot state	W	4.4	5	5.8	7	9	
Rated making capacity								
I <sub>rms</sub>	Conforming to IEC 60947-4	A	12 or 15 x I <sub>th</sub> (above this value, the breaker trips)					
I <sub>peak</sub>	Conforming to IEC 60947-2	kA	105					
Rated breaking capacity	conforming to IEC 60947-2	Operational voltage	V	220/240	380/415	440	480/525	600/690
		Value of cos φ		0.25	0.25	0.25	0.25	0.5
		Cycle P1 (O-t-CO) I <sub>cu</sub> <sup>(1)</sup>	kA rms	50	50	50	35	10
		Cycle P2 (O-t-CO-t-CO) I <sub>cs</sub> <sup>(1)</sup>	kA rms	50	50	50	35	10
	conforming to IEC 60947-6-2 ensuring reliability of operation	I <sub>cu</sub> = I <sub>cs</sub>	kA rms	up to 80 (see table page A5/27)	up to 80 (see table page A5/27)	50	30	10
Total breaking time		ms	4					
Electrical durability in AC-3 at I <sub>e</sub> max and at 415 V after 1 cycle O-CO-r-CO at I <sub>sc</sub>	Prospective rms short-circuit current at terminals of a new device	kA	3	10	25	35	50	80
	Millions of operating cycles		1	0.9	0.6	0.5	0.2	<sup>(2)</sup>
Thermal limit	With I <sub>sc</sub> max. at 415 V, 50 Hz	A²s	300 x 10³					
Cabling			Maximum c.s.a.		Minimum c.s.a.			
	Flexible cable without cable end	mm²	1 x 50 or 2 x 35		1 x 6			
	Flexible cable with cable end	mm²	2 x 25		1 x 6			
	Solid cable	mm²	1 x 50		1 x 6			
Tightening torque		N.m	6					

Characteristics of thermal-magnetic or magnetic only protection modules						
Module type			LB1LD03P	LB1LD03M	LB6LD03M	LB1LD03L
Protection			Standard motors	Standard motors	Frequent starting	Distribution circuits
	Conforming to standards		NF C 63-650	NF C 63-650	NF C 63-650	NF C 63-120
	Number of poles		3	3	3	3
	Number of protected poles		3	3	3	3
	Rated operational voltage	V	690	690	690	690
Thermal protection	Max. continuous current	A	13...63	13...63	13...63	13...63
	Setting (I <sub>rt</sub> min./I <sub>rt</sub> max.)	A	10/13...45/63	10/13...45/63	—	10/13...45/63
	Temperature compensation	°C	-20...+60	20...+60	20...+60	20...+60
	Protection against phase imbalance		With	With	Without	Without
	Tripping class		20	20	—	—
Magnetic protection conforming to IEC 60947-1/2/4/6-2	Instantaneous trip current setting range		Fixed at 15 I <sub>rt</sub> max	6...12 I <sub>rt</sub> max (usual setting 9...10 I <sub>rt</sub> max)	6...12 I <sub>rt</sub> max	3...6 I <sub>rt</sub> max
	Tripping tolerance		±20 %	±20 %	±20 %	±20 %

Characteristics of versions without control test function, with padlocking facility		
Conforming to standards		IEC 60947
Rated operational voltage	V	690
Mechanical durability	Operating cycles	10 000
Padlocking		By 1, 2 or 3 padlocks, Ø8 mm shank

Characteristics of versions with control test function and padlocking facility		
Conforming to standards		IEC 60947, NF C 63-130, VDE 0660, VDE 0113
Rated operational voltage	V	690
Mechanical durability	Operating cycles	10 000
Padlocking		1, 2 or 3 padlocks, shank Ø8 mm max and Ø5 mm min. When flush mounting, interlocking of the enclosure or cabinet door is possible.

(1) O: breaking short-circuit current (open),  
t: time  
CO: closing on short-circuit, breaking short-circuit current (closed-open)  
(2) Please consult us.



Instantaneous auxiliary contacts LA1L●●							
Conventional thermal current (I <sub>th</sub> )		<b>A</b>	6				
Rated insulation voltage (U <sub>i</sub> )	Conforming to IEC 60947-5-1	<b>V</b>	690				
Switching capacity	With U ≥ 17 V and I ≥ 10 mA	<b>mVA</b>	600				
Rated operational ~ category power AC-15 <sup>(1)</sup>	<b>Voltage</b>	<b>V</b>	<b>48</b>	<b>110/127</b>	<b>220/240</b>	<b>380/415</b>	<b>440</b>
	1 million operating cycles	<b>VA</b>	300	500	600	520	500
	1.5 million operating cycles	<b>VA</b>	160	300	330	300	280
Making capacity Rated operational --- category power DC-13 <sup>(2)</sup>	~ category AC-15	<b>VA</b>	1500	3500	6000	7500	7000
	<b>Voltage</b>	<b>V</b>	<b>24</b>	<b>48</b>	<b>110</b>	<b>220</b>	<b>440</b>
	1 million operating cycles	<b>W</b>	120	90	75	68	61
Making capacity	1.5 million operating cycles	<b>W</b>	70	50	38	33	28
	--- category DC-13	<b>W</b>	800	700	400	260	220
Cabling		<b>mm<sup>2</sup></b>	Maximum c.s.a.: 2 x 2.5 Minimum c.s.a.: 2 x 1				

Isolating auxiliary contacts LA1LC03●							
Conventional thermal current (I <sub>th</sub> )		<b>A</b>	6				
Rated insulation voltage (U <sub>i</sub> )	a.c. supply	<b>V</b>	690				
Conforming to IEC 60947 and NF C 63-130	d.c. supply	<b>V</b>	125				
Cabling		<b>mm<sup>2</sup></b>	Maximum c.s.a.: 2 x 1.5 or 1 x 2.5				

Signalling contacts LA1LC001							
Conventional thermal current (I <sub>th</sub> )		<b>A</b>	3				
Rated insulation voltage (U <sub>i</sub> )	Conforming to IEC 60947-5-1	<b>V</b>	250				
Operational power for 200000 operating cycles	~	<b>Voltage</b>	<b>V</b>	–	–	<b>110/127</b>	<b>220</b>
		Resistive load	<b>VA</b>	–	–	600	750
		Lamp load <sup>(3)</sup>	<b>VA</b>	–	–	90	125
		Inductive load <sup>(4)</sup>	<b>VA</b>	–	–	875	500
		Motor <sup>(5)</sup>	<b>VA</b>	–	–	160	200
	---	<b>Voltage</b>	<b>V</b>	<b>24</b>	<b>48</b>	<b>110/125</b>	<b>200</b>
		Resistive load	<b>W</b>	100	100	50	50
		Lamp load <sup>(3)</sup>	<b>W</b>	50	50	6	7.5
		Inductive load <sup>(4)</sup>	<b>W</b>	75	75	50	50
		Motor <sup>(5)</sup>	<b>W</b>	75	75	6	7.5
Cabling		<b>mm<sup>2</sup></b>	Maximum c.s.a.: 2 x 2.5 Minimum c.s.a.: 2 x 1				

- (1) Electrical durability on an inductive load such as the coil of an electromagnet: making current ( $\cos \varphi 0.7$ ) = 10 times the power broken ( $\cos \varphi 0.4$ ).
- (2) Electrical durability on an inductive load such as the coil of an electromagnet, the time constant increasing with the load.
- (3) Lamp load: peak current = 10 times the rated current.
- (4) Inductive load:  $\cos \varphi 0.4$  for a.c. operation; time constant 7 ms for d.c. operation.
- (5) Motor: peak current = 6 times the rated current.



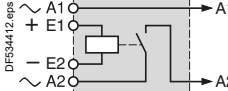
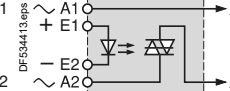
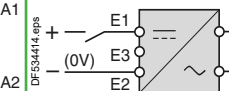
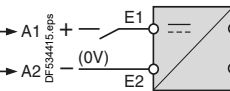















# TeSys

## Integral 63 All-in-one motor starter

### Characteristics

Type		Interface modules			Converters			
Used for control of the integral 32			By a programmable controller, with a.c. control of the electromagnet			By a programmable controller, with d.c. control of the electromagnet Control on d.c. supply		
Ambient air temperature around the device								
	Storage	°C	-25...+70			-25...+70		
	Operation	°C	-25...+50			-25...+50		
Isolation		kV	rms voltage between inputs and outputs: 2.5			Common negative terminal		
Cabling	Min.	mm²	1 x 1			1 x 1		
	Max.	mm²	2 x 2.5			2 x 2.5		
Operating limits			0.85...10.1 Uc			0.8...1.1 Uc <sup>(2)</sup>		
Protection			Against reverse polarity (by diode) and against overvoltage			Against reverse polarity (by diode) and against overvoltage		
Module or converter type			LA1LC 580BD   580ED   180BD			LA1LC 080BD   080ED   080FD		

### Control circuit characteristics

Schemes			<b>LA1LC●580●D</b>			<b>LA1L●180BD</b>			<b>LA1L●080BD</b> <b>LA1L●080ED</b>			<b>LA1L●080FD</b>		
														
Indication of input state			By LED			—			—			—		
Input signals (logic side)	<b>Voltage</b>	<b>V</b>	 24 (E1-E2)	 48 (E1-E2)	 5...24 (E1-E2)	 24 (E1-E2)	 48 (E1-E2)	 5...24 (E1-E2)	 24 <sup>(1)</sup> (E3-E2)	 48 <sup>(1)</sup> (E3-E2)	—	 24 <sup>(1)</sup> (E3-E2)	 48 <sup>(1)</sup> (E3-E2)	—
	Current	<b>mA</b>	30	20	15...24 V 8.5...5 V	50	25	15...24 V 8.5...5 V	20	10	—	20	10	—
State "0" guaranteed	For U	<b>V</b>	< 2.4	< 4.8	< 2.5	< 2.4	< 4.8	< 2.5	< 7	< 14	—	< 7	< 14	—
	For I	<b>mA</b>	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 2.5	—	< 5	< 2.5	—
State "1" guaranteed	For U	<b>V</b>	> 20.4	> 40.8	> 4	> 20.4	> 4	> 4	> 14	> 28	—	> 14	> 28	—
	Supply voltage	<b>V</b>	~ 24...240 (A1-A2)	~ 24...240 (A1-A2)	~ 24...240 (A1-A2)	~ 24...240 (A1-A2)	~ 24...240 (A1-A2)	~ 24...240 (A1-A2)	~ 24...240 (A1-A2)	 24 <sup>(2)</sup> (E1-E2)	 48 <sup>(2)</sup> (E1-E2)	 110 <sup>(2)</sup> (E1-E2)	 24 <sup>(2)</sup> (E1-E2)	 48 <sup>(2)</sup> (E1-E2)

### Operating characteristics

Electrical durability in millions of operating cycles				5						1					
Average consumption	Inrush	50 Hz	VA	160	160	160	375	375	375	—	—	—	—	—	—
		60 Hz	VA	185	185	185	450	450	450	—	—	—	—	—	—
		---	W	—	—	—	—	—	—	250	250	250	300	300	300
	Sealed	50/60 Hz	VA	12	12	12	25	25	25	—	—	—	—	—	—
		---	W	—	—	—	—	—	—	4	4	4	8	8	8
Operating time at 20 °C and at Uc	Pull-in		ms	15...30	15...30	10...35	20...40	20...40	10...45	30	30	30	35	35	35
	Drop-out		ms	22...35	22...35	8...30	25...45	25...45	8...30	15	15	15	20	20	20

(1) For direct control by external contact: connect E1-E3.

(2) Warning: for supply from rectified a.c., the 2 following conditions must be met: the power supply must exceed 300 VA and the maximum ripple must be ≤ 14 %.



# TeSys

## Integral 63 All-in-one motor starter

### Characteristics

#### Environment

Conforming to standards			IEC 60337-1
Protective treatment			"TH"
Ambient air temperature around the device	Storage	°C	-40...+80
	Operation	°C	-25...+55
	Permissible for operation at U <sub>c</sub>	°C	-25...+70
Protection against direct finger contact			Conforming to VDE 0106


#### Tripping devices

Type			LA1LC070●, LC072●	LA1LC071●
Pull-in voltage	U <sub>c</sub>		0.8...1.1	0.7...1.1
Drop-out voltage	U <sub>c</sub>		0.35...0.7	—
Average consumption	Inrush	VA	8	8
	Sealed	VA	4	4
Minimum pulse time		ms	—	10

#### Reset devices

Type			LA1LC052●
Consumption		VA	9
Duration of a reset cycle		s	9
Minimum pulse duration		s	0.5

#### Suppressor module LA9D09982

Type of protection		RC (resistor-capacitor)
Connection scheme		
Operational voltage	V	≤ 250

Ref.

i



Integral 63



# TeSys

## Integral 63 All-in-one motor starter

### Characteristics

Breaking capacity of Integral 63 all-in-one motor starters, according to the operational voltage and protection module fitted.

Breaking capacity							
Protection module			Operational voltage				
Reference	I <sub>rt</sub>		220/240 V	400/415 V	440 V	500 V	600/690 V
	min	max					
	A	A	kA	kA	kA	kA	kA
LB●LD03●16	10	13	≥ 130	≥ 130	≥ 130	≥ 130	10
LB●LD03●21	13	18	≥ 130	≥ 130	≥ 130	≥ 130	10
LB●LD03●22	18	25	≥ 130	≥ 130	50	35	10
LB●LD03●53	23	32	≥ 130	80	50	35	10
LB●LD03●55	28	40	≥ 130	80	50	30	10
LB●LD03●57	35	50	≥ 130	80	50	30	10
LB●LD03●61	45	63	≥ 130	50	50	30	10

Ref.

i



Integral 63



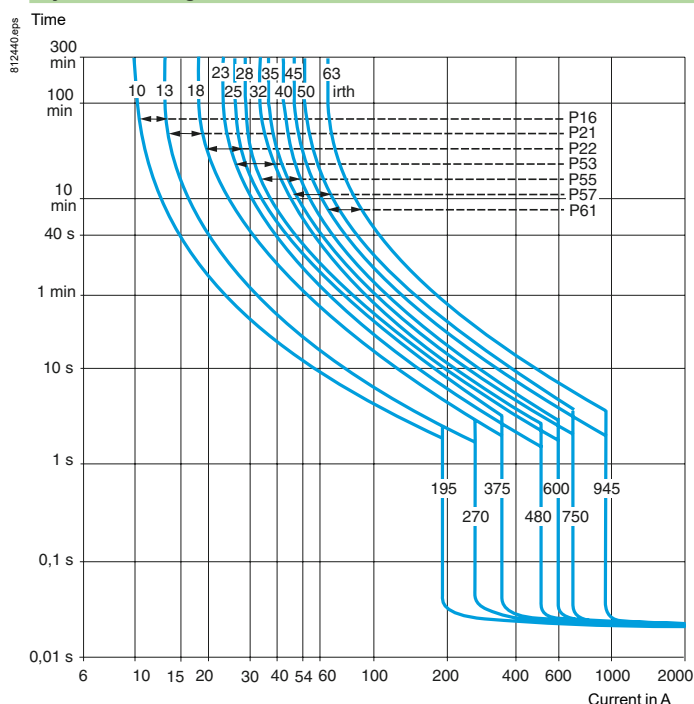
Ref.



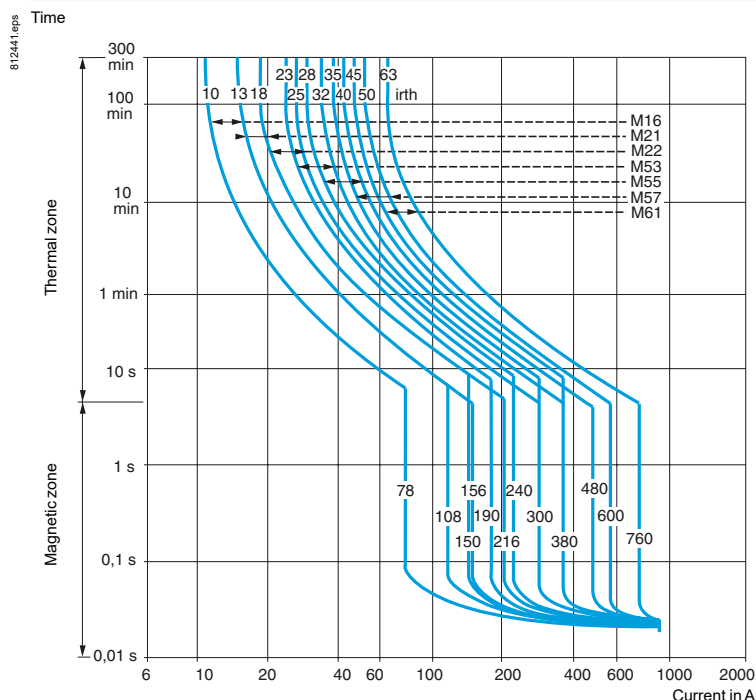
Integral 63

## Motor protection (normal starting) - Tripping curves

By thermal-magnetic modules LB1LD03P <sup>(1)</sup>



By thermal-magnetic modules LB1LD03M <sup>(1)</sup>

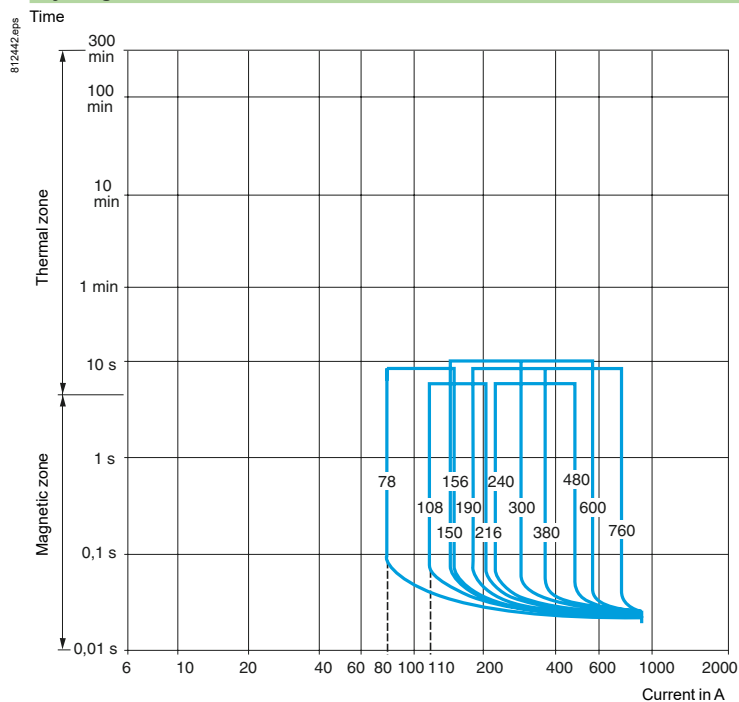


<sup>(1)</sup> Thermal protection: the average operating times shown in the above curves are for an ambient air temperature of 20 °C, without prior current flow (cold state). The average operating times after prolonged current flow (hot state) can be calculated by applying the coefficient 0.5.



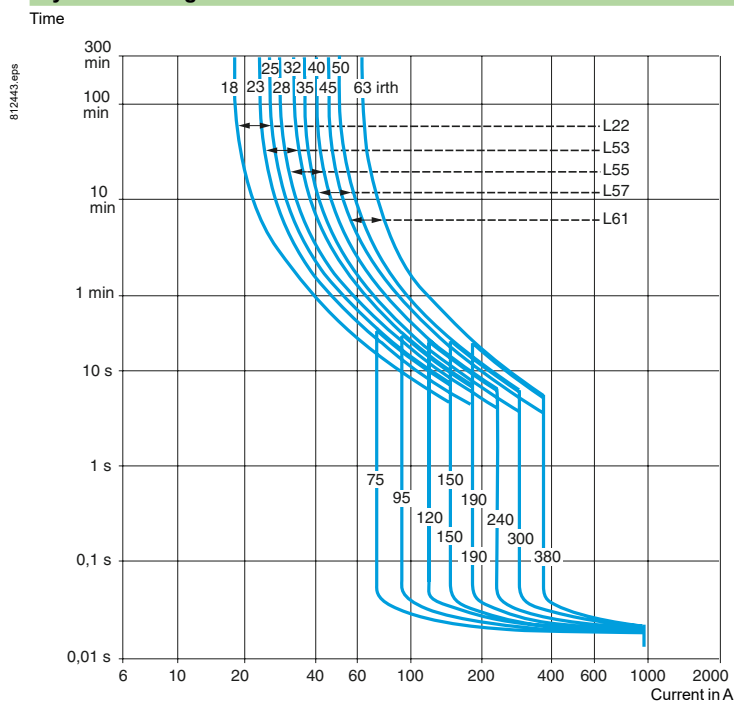
### Motor protection (frequent starting) - Tripping curves

By magnetic modules LB6LD03M



### Distribution circuit protection - Tripping curves

By thermal-magnetic modules LB1LD03L

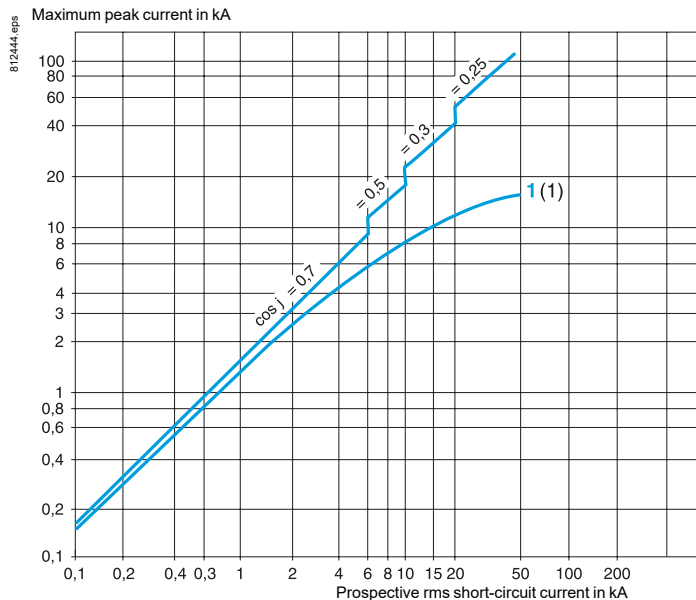




#### Current limitation and thermal limit on short-circuit

3-phase 400/415 V, 50 Hz

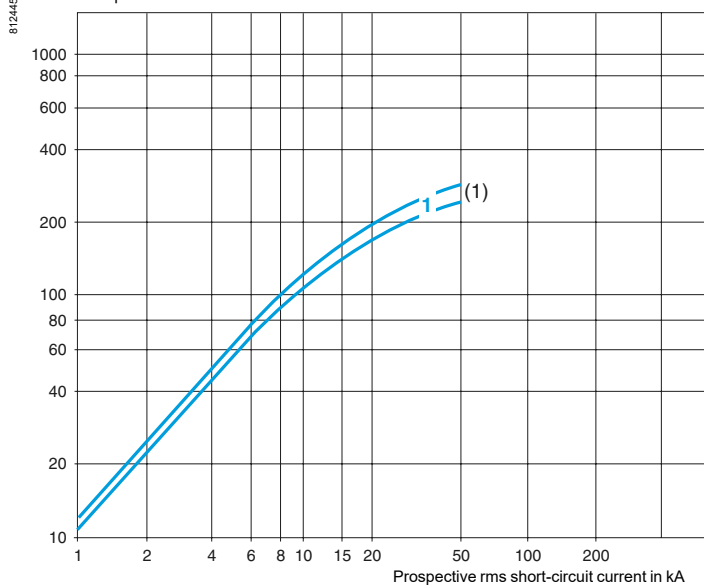
Current limitation on short-circuit



1 18 to 25 A up to 45 to 63 A

#### Maximum thermal limit on short-circuit

Thermal limit  $I^2t$  in kA<sup>2</sup>s in the short-circuit protection zone



1 18 to 25 A up to 45 to 63 A

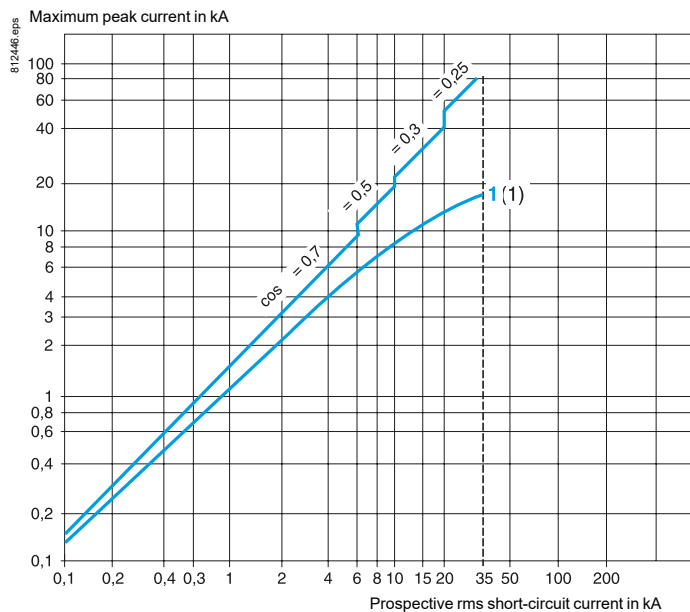
(1) LB1LD03●22 to LD06●61: rating of associated thermal overload module.



### Current limitation and thermal limit on short-circuit

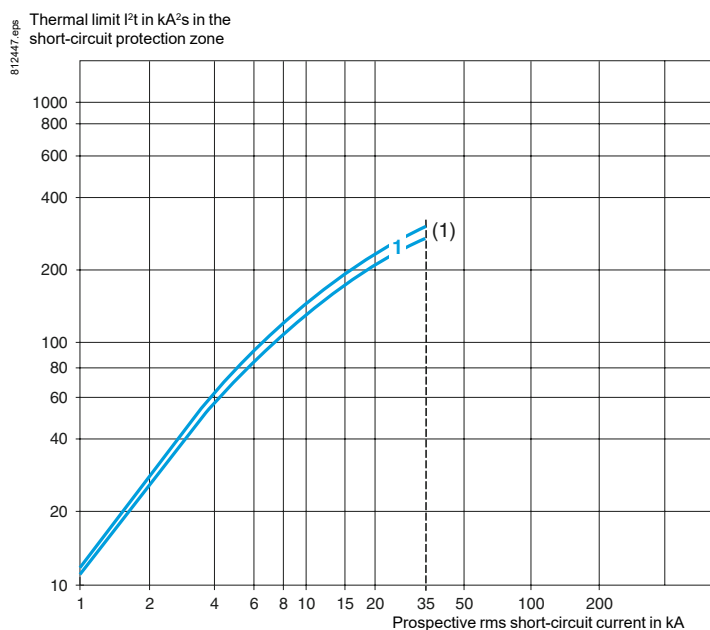
3-phase 480/500 V, 50 Hz

Current limitation on short-circuit



1 18 to 25 A up to 45 to 63 A

Current limitation on short-circuit



1 18 to 25 A up to 45 to 63 A

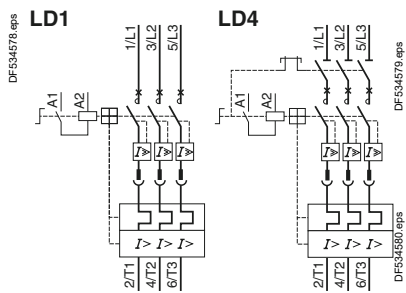
(1) LB1LD03●22 to LD03●61: rating of associated thermal overload module.



# TeSys

## Integral 63 All-in-one motor starter

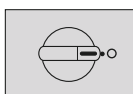
### Operating status indication



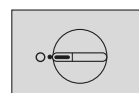
□ Contact open  
■ Contact closed

**LD1** **LD4**

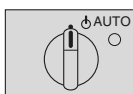
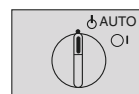
Off + control test function



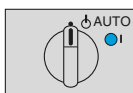
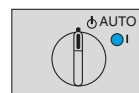
Off



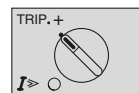
On, contactor open



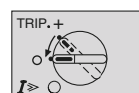
On, contactor closed



Off after overload



Tripped on overload



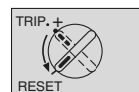
Tripped on short-circuit



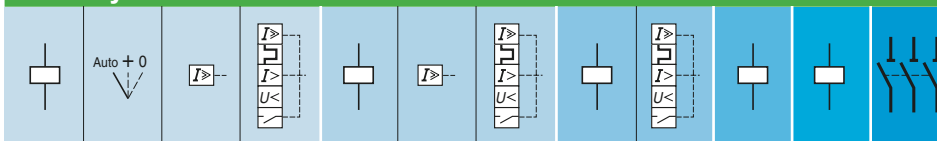
Off after short-circuit



Manual reset



#### Auxiliary contact actuators



#### Auxiliary contacts

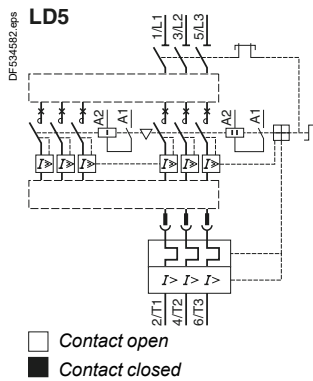
LA1 LC010				LA1 LC012			LA1 LC025		LA1 LC001	LA1 LC020	LA1 LC030
13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	41 42	13 23 31 14 24 32	(53) (54) 63
13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	41 42	13 23 31 14 24 32	53 54
13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	41 42	13 23 31 14 24 32	53 54
13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	41 42	13 23 31 14 24 32	53 54
13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	41 42	13 23 31 14 24 32	53 54
13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	41 42	13 23 31 14 24 32	53 54
13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	41 42	13 23 31 14 24 32	53 54
13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	41 42	13 23 31 14 24 32	53 54
13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	41 42	13 23 31 14 24 32	53 54
13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	41 42	13 23 31 14 24 32	53 54
13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	41 42	13 23 31 14 24 32	53 54
13 23 31 14 24 32	16 18 15	06 08 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	41 42	13 23 31 14 24 32	53 54



# TeSys

## Integral 63 All-in-one motor starter

### Operating status indication



Auxiliary contact actuators														
	Auto + 0 													
LA1 LC010				LA1 LC012			LA1 LC025		LA1 LC020	LA1 LC001	LA1 LC021	LA1 LC031		
13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64		
13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64		
13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64		
13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64		
13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64		
13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64		
13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64		
13 23 31 14 24 32	16 18 15	06 05	96 98 95	13 23 31 14 24 32	08 05	98 95	13 23 31 14 24 32	96 98 95 95	13 23 31 14 24 32	41 42	13 23 31 14 24 32	53 63 54 64		



# TeSys

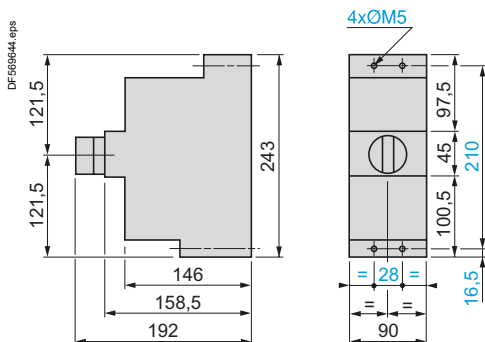
## Integral 63 All-in-one motor starter

### Dimensions, mounting

#### All-in-one motor starters Integral 63

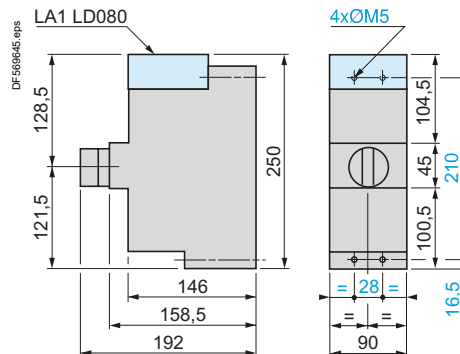
Control circuit: a.c.

LD●LD●30 + LB●LD03



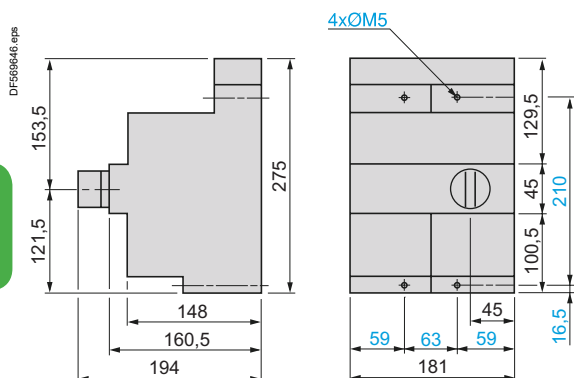
Control circuit: d.c.

LD●LD●30 + LB●LD03 + LA1LD080



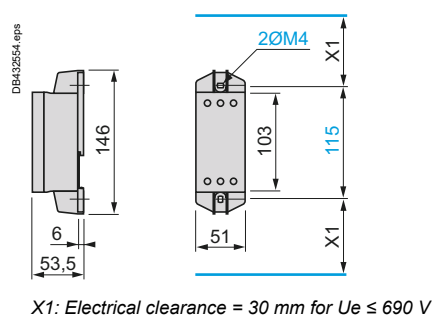
#### Reversing all-in-one motor starters Integral 63

LD5LD●30 + LB●LD03M



#### Current limiter

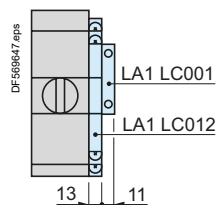
LA9LB920



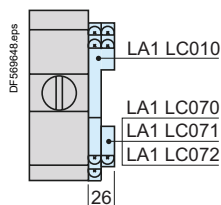
#### Add-on blocks

For mounting on all-in-one motor starters Integral 63

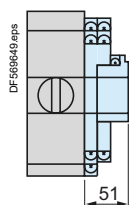
LA1LC012  
LA1LC001



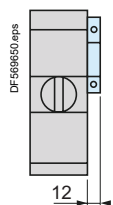
LA1LC010  
LA1LC07●



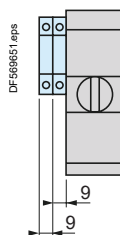
LA1LC052



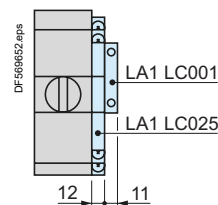
LA1LC020



LA1LC030  
(1 ou 2)

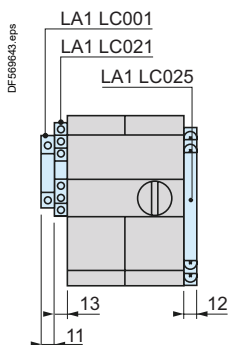


LA1LC025  
LALC001

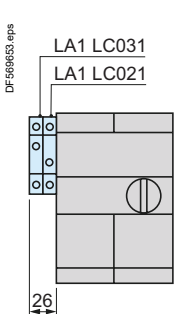


For mounting on reversing all-in-one motor starters Integral 63

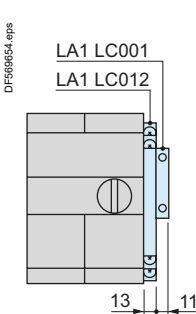
LA1LC021, LC025  
LA1LC001



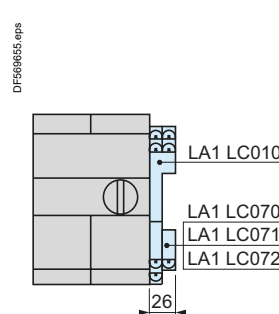
LA1LC031



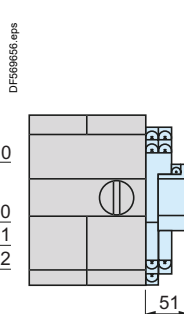
LA1LC012  
LA1LC001



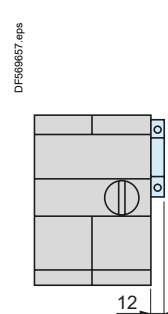
LA1LC010  
LA1LC07●



LA1LC052●



LA1LC020





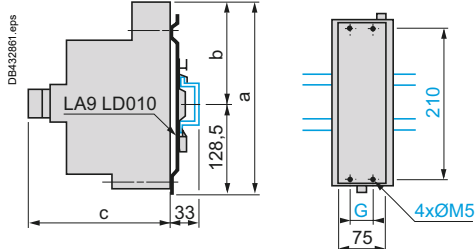
# TeSys

## Integral 63 All-in-one motor starter

### Dimensions, mounting

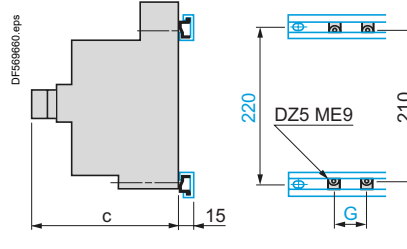
#### Mounting

##### On 75 mm L rail, with mounting plate LA9LD010



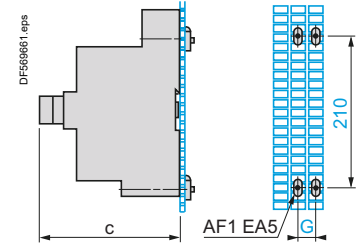
	a	b	c	G
LD1	266	137.5	192	28
LD4	266	137.5	192	28
LD5	282	153.5	194	63

##### On 32 mm L rails, at 220 mm centres



	c	G
LD1	192	28
LD4	192	28
LD5	194	63

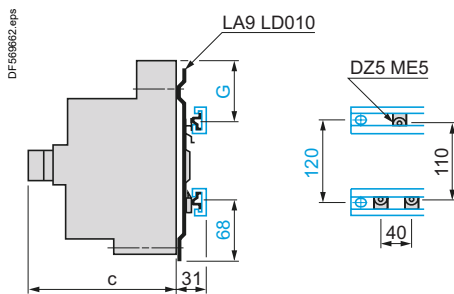
##### On pre-slotted mounting plate AM1P



	c	G
LD1	192	28
LD4	192	28
LD5	194	63

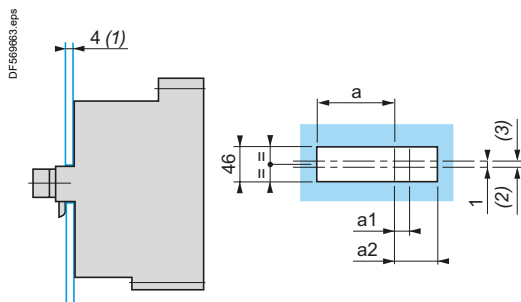
##### With mounting plate LA9LD010

##### On 32 mm L rails, at 120 mm centres



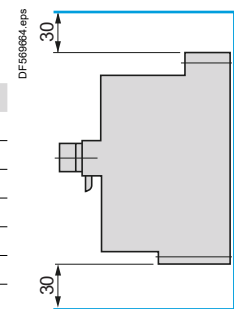
	c	G
LD1	192	78
LD4	192	78
LD5	194	94

#### Flush mounting (all-in-one motor starters and reversing all-in-one motor starters)



	a	a1	a2
LD1LD030	90	—	—
LD4LD●30	90	—	—
LD5LD●30	181	—	—
LA1LC010	—	13	—
LA1LC012	—	13	—
LA1LC010 + LA1LC052●	—	—	51
LA1LC012 + LA1LC052●	—	—	51

#### Minimum electrical clearance



(1) Maximum door thickness for interlocking by LD4 and LD5.

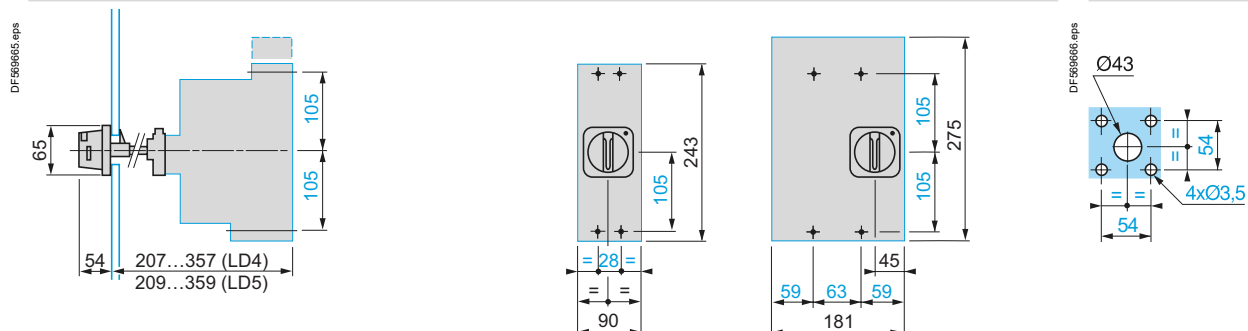
(2) Centre of operating handle.

(3) Fixing centre.

#### Adjustable door interlock mechanisms LA9LC33● and LA9LC53●

##### For mounting on LD4LD●30 and LD5LD●30

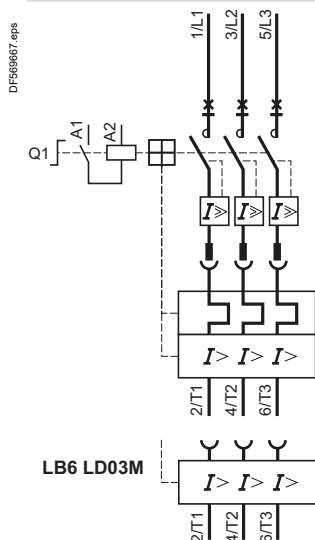
##### Door drillings



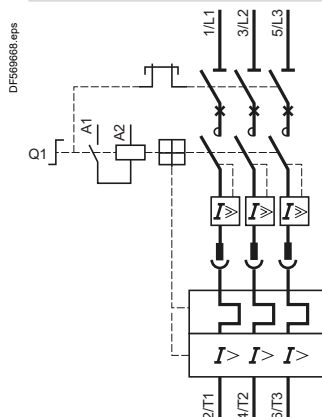


#### All-in-one motor starters Integral 63 with protection module LB●

##### LD1LD030 + LB1LD03●

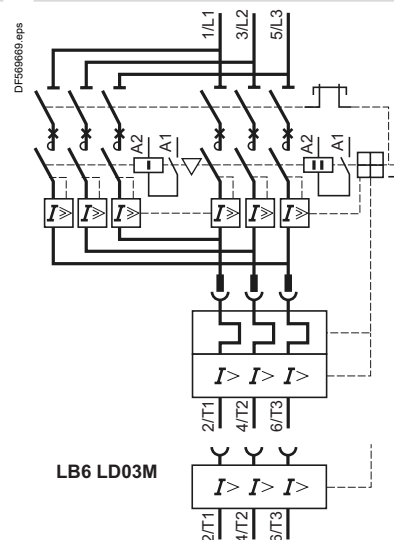


##### LD4LD●30 + LB1LD03●



#### Reversing all-in-one motor starters Integral 63 with protection module LB●

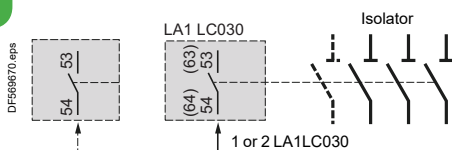
##### LD5LD●30 + LB1LD03M ou LD03P



#### Add-on blocks

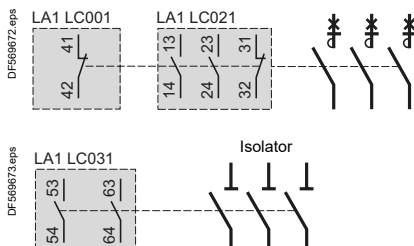
##### For all-in-one motor starters LD2

Mounted on LH side



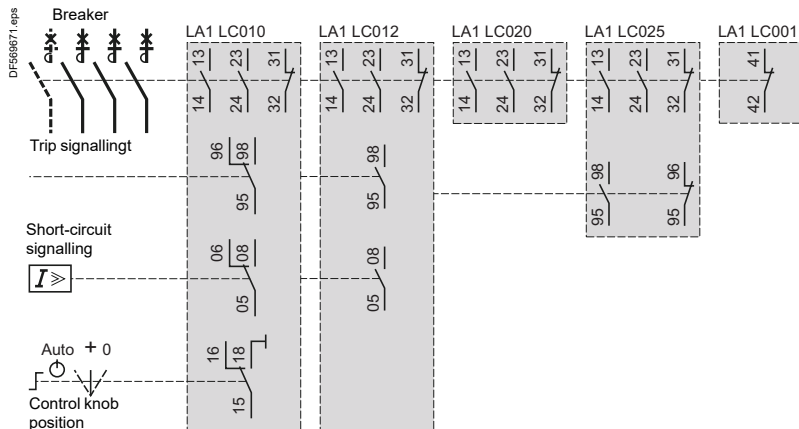
##### For reversing all-in-one motor starters LD5

Mounted on LH side



##### For all-in-one motor starters LD1 or LD4 and reversing all-in-one motor starters LD5

Mounted on RH side





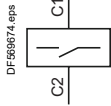
# TeSys

## Integral 63 All-in-one motor starter

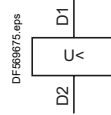
### Schemes

#### Tripping devices <sup>(1)</sup> for LD1, LD4, LD5

LA1LC071

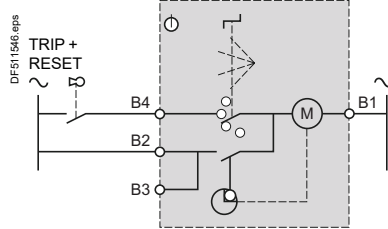


LA1LC070, LC072



#### Remote electrical reset devices <sup>(1)</sup> for LD1 to LD5

LA1LC052

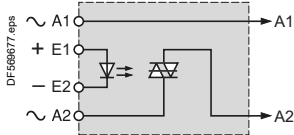


The use of instantaneous auxiliary contact block LA1LC020 prevents the use of tripping devices or electrical reset devices

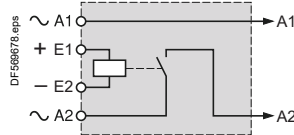
<sup>(1)</sup> For all-in-one motor starters and reversing all-in-one motor starters already fitted with an LA1 LC010 or LA1 LC012 instantaneous auxiliary contact block.

#### Interface modules

LA1LD180



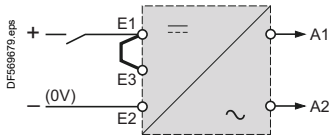
LA1LD580



#### Voltage converter LA1LD080 (supply with all-in-one motor starters for control circuit operation)

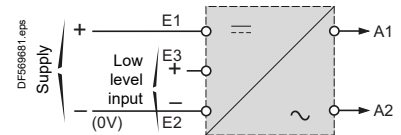
Switching by control contact

24 or 48 V



Switching by "Low level" input

24 or 48 V





## Terminology

### Altitude

The rarefied atmosphere at high altitude reduces the dielectric strength of the air and hence the rated operational voltage of the all-in-one motor starter. It also reduces the cooling effect of the air and hence the rated operational current of the all-in-one motor starter (unless the temperature drops at the same time).

No derating is necessary up to 3000 m.

Derating factors to be applied above this altitude for main pole operational voltage and current (a.c. supply) are as follows:

Altitude	3500 m	4000 m	4500 m	5000 m
<b>Rated operational voltage</b>	0.90	0.80	0.70	0.60
<b>Rated operational current</b>	0.92	0.90	0.88	0.86

### Ambient air temperature

The temperature of the air surrounding the device, measured near to the device.

The operating characteristics are given:

- with no restriction for temperatures between - 5 and + 55 °C.
- with restrictions, if necessary, for temperatures between - 50 and + 70 °C.

### Rated operational current (Ie)

This is defined taking into account the rated operational voltage, operating rate and duty, utilisation category and air temperature around the device.

### Conventional rated thermal current (Ith) <sup>(1)</sup>

The current Ith which a closed all-in-one motor starter can sustain for a minimum of 8 hours without its temperature rise exceeding the limits given in the standards.

### Short time rating

The current which a closed all-in-one motor starter can sustain for a short time, after a period of no load, without dangerous overheating.

### Rated operational voltage (Ue)

This is the voltage value which, in conjunction with the rated operational current, determines the use of the all-in-one motor starter or starter, and on which the corresponding tests and the utilisation category are based. For 3-phase circuits, it is expressed as the voltage between phases.

Apart from exceptional cases such as rotor short-circuiting, the rated operational voltage Ue is less than or equal to the rated insulation voltage Ui.

### Rated control circuit voltage (Uc)

The rated value of the control circuit voltage, on which the operating characteristics are based. For a.c. applications, the values are given for a near sinusoidal wave form (less than 5 % total harmonic distortion).

### Rated insulation voltage (Ui)

This is the voltage value used to define the insulation characteristics of a device and referred to in dielectric tests determining leakage paths and creepage distances. As the specifications are not identical for all standards, the rated values given for each of them are not necessarily the same.

### Rated impulse withstand voltage (Uimp)

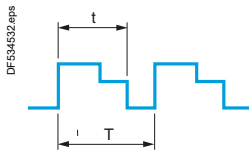
This is the highest peak value of an impulse voltage, of prescribed form and polarity, which the device is able to withstand without failure under specified test conditions, and to which isolation clearance values are referred.

The rated impulse withstand voltage of a device must be equal to or higher than the values stated for the transient overvoltages appearing in the circuit in which the device is fitted.

**Note:** these definitions are based on extracts from standard IEC 60947.

**(1)** Conventional free air thermal current, conforming to IEC standards.





## Terminology

### Rated operational power (expressed in kW)

The rated power of the standard motor which can be switched by the all-in-one motor starter, at the stated operational voltage.

### Rated breaking capacity (I<sub>q</sub>) <sup>(1)</sup>

This is the current value which the all-in-one motor starter can break in accordance with the breaking conditions specified in the IEC standard.

### Rated making capacity <sup>(1)</sup>

This is the current value which the all-in-one motor starter can make in accordance with the making conditions specified in the IEC standard.

### On-load factor (m)

This is the ratio between the time the current flows (t) and the duration of the cycle (T):

$$m = \frac{t}{T}$$

Cycle duration: duration of current flow + time at zero current.

### Pole impedance

The impedance of one pole is the sum of the impedance of all the circuit components between the input terminal and the output terminal.

The impedance comprises a resistive component (R) and an inductive component ( $X = L\omega$ ). The total impedance therefore depends on the frequency and is normally given for 50 Hz. The average value is given for the pole at its rated operational current.

### Electrical durability

This is the average number of on-load operating cycles which the main pole contacts can perform without maintenance. The electrical durability depends on the utilisation category, the rated operational current and the rated operational voltage.

### Mechanical durability

This is the average number of no-load operating cycles (i.e. with zero current flow through the main poles) which the all-in-one motor starter can perform without mechanical failure.

### Coordination

The coordination of protection devices involves combining, in a selective way, a short-circuit protection device (fuses or magnetic circuit-breakers) with a contactor and an overload protection device. Its objective is to break any abnormal current, in plenty of time, without any danger to personnel, whilst providing adequate protection of the equipment against an overload or short-circuit current.

#### Type 1 - IEC 60947-4-1

In a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and may not be able to resume operation without repair or the replacement of parts.

#### Type 2 - IEC 60947-4-1

In a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and must be able to resume operation. The risk of contact welding is permissible if they can be easily separated.

#### Total, ensuring reliability of operation - IEC 60947-6-2

In the event of a short-circuit, no damage or risk of welding is permissible on the equipment constituting the motor starter. Operation can be resumed without any maintenance.

**Note:** these definitions are based on extracts from standard IEC 60947.

**(1)** For a.c. applications, the breaking and making capacities are expressed by the rms value of the symmetrical component of the short-circuit current. Taking into account the maximum asymmetry which may exist in the circuit, the contacts therefore have to withstand a peak asymmetrical current which may be twice the rms symmetrical component.



### Definition

The standard utilisation categories define the current values which the all-in-one motor starter must be able to make or break. These values depend on:

- the type of load being switched: squirrel cage or slip ring motor, resistors,
- the conditions under which making or breaking takes place: motor stalled, starting or running, reversing, plugging.

### Reminder of standards IEC 60947

- IEC 60947-1: general rules,
- IEC 60947-2: circuit breakers,
- IEC 60947-3: isolating devices,
- IEC 60947-4-1: contactors and motor starters,
- IEC 60947-5-1: control and signalling units,
- IEC 60947-6-2: control and protection devices,

### Standards for all-in-one motor starters

#### IEC 60947-4-1

Standard IEC 60947-4-1: covers contactors and electromechanical motor starters. It concerns:

- types of equipment with main contacts designed for connection to circuits whose rated operational voltage does not exceed 1000 V for a.c. applications or 1500 V for d.c. applications,
- contactors used in conjunction with overload and/or short-circuit protection devices,
- motor starters used in conjunction with separate short-circuit protection devices and/or with separate short-circuit protection devices and built-in overload protection devices,
- contactors and combination motor starters which incorporate their own short-circuit protection device.

#### IEC 60947-6-2

Standard IEC 60947-6: covers multi-function equipment.

It concerns connection, power switching and protection devices (or equipment) with main contacts designed for connection to circuits whose rated operational voltage is less than or equal to 1000 V for a.c. applications, or 1500 V for d.c. applications. Such devices are designed to perform both the power switching function and the protection of remotely controlled circuits function; they can also perform other functions, such as isolation.

**After short-circuit (Isc) tests, the products must be able to make and break the currents corresponding to the specified utilisation categories, and to the number of operating cycles specified in the standard, without failing. This series of tests is completed by temperature rise tests.**

**Standard IEC 947-6-2 specifies that, in the event of a short-circuit, no damage or risk of contact welding is permissible on the devices constituting the motor starter.**

**The integral all-in-one motor starter, through its design, ensures reliability of operation. After eliminating the fault, operation can be resumed instantly without any maintenance work on the product, other than resetting.**

### Utilisation categories for a.c. applications

#### Category AC-1

This category applies to all types of a.c. device (load) with a power factor equal to or greater than 0.95 ( $\cos \varphi \leq 0.95$ ). Non inductive or slightly inductive loads.

*Application examples: heating, distribution.*

#### Category AC-2

This category applies to starting, plugging and inching of slip ring motors.

- On closing, the all-in-one motor starter makes the starting current, which is about 2.5 times the rated current of the motor.
- On opening, it must break the starting current, at a voltage less than or equal to the mains supply voltage.

#### Category AC-3

This category applies to squirrel cage motors with breaking while motor running.

- On closing the all-in-one motor starter makes the starting current, which is about 5 to 7 times the rated current of the motor.
- On opening, it breaks the rated current drawn by the motor; at this point, the voltage at the all-in-one motor starter terminals is about 20 % of the mains supply voltage. Breaking is light.

*Application examples: all standard squirrel cage motors (lifts, escalators, conveyor belts, bucket elevators, compressors, pumps, mixers, air conditioning units, etc.).*



## Standards for all-in-one motor starter

### Utilisation categories for a.c. applications

#### Category AC-4

This category covers starting, plug braking and inching of squirrel cage motors. On closing, the all-in-one motor starter makes a current peak which may be as high as 5 to 7 times the rated motor current. On opening, it breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe.  
*Application examples: printing machines, wire drawing machines, hoisting equipment, metallurgy industry.*

#### Category AC-41

This category applies to all types of a.c. device (load) with a power factor equal to or greater than 0.95 ( $\cos \varphi \leq 0.95$ ). Non inductive or slightly inductive loads.  
*Application examples: heating, distribution.*

#### Category AC-42

This category applies to starting, plugging and inching of slip ring motors.  
■ On closing, the all-in-one motor starter makes the starting current, which is about 2.5 times the rated current of the motor.  
■ On opening, it must break the starting current, at a voltage less than or equal to the mains supply voltage.

#### Category AC-43

This category applies to squirrel cage motors with breaking while motor running; inching or occasional reversing of limited duration are permissible if the number of operating cycles does not exceed 5 per minute, or 10 within a 10 minute period.  
■ On closing the all-in-one motor starter makes the starting current, which is about 5 to 7 times the rated current of the motor.  
■ On opening, it breaks the rated current drawn by the motor; at this point, the voltage at the all-in-one motor starter terminals is about 20% of the mains supply voltage. Breaking is light.  
*Application examples: all standard squirrel cage motors: lifts, escalators, conveyor belts, bucket elevators, compressors, pumps, mixers, air conditioning units, etc.).*

#### Category AC-44

This category covers applications with plug braking and inching of squirrel cage or slip ring motors. On closing, the all-in-one motor starter makes a current peak which may be as high as 5 to 7 times the rated motor current. On opening, it breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe.  
*Application examples: printing machines, wire drawing machines, hoisting equipment, metallurgy industry.*

### Tripping classes of protection modules

The creation of thermal tripping classes allows better adaptation of the thermal protection to suit different motor and application technologies (short or long starting times). Conforming to IEC 60947-4-1 and IEC 60947-6-2.

Class	10 A	10	20	30
Tripping time at 7.2 I <sub>r</sub> <sup>(1)</sup>	2...10 s	4...10 s	6...20 s	9...30 s

## Standards for auxiliary contacts

### IEC 60947-5

Standard IEC 60947-5-1: covers switching devices and components for control circuits.

It concerns electromechanical devices for control circuits.

### Utilisation categories for a.c. applications

#### Category AC-14 <sup>(2)</sup>

This category applies to the switching of electromagnetic loads whose power drawn with the electromagnet closed is less than 72 VA.  
*Application example: switching the operating coil of contactors and relays.*

#### Category AC-15 <sup>(2)</sup>

This category applies to the switching of electromagnetic loads whose power drawn with the electromagnet closed is greater than 72 VA.  
*Application example: switching the operating coil of contactors.*

### Utilisation categories for d.c. applications

#### Category DC-13 <sup>(3)</sup>

This category applies to the switching of electromagnetic loads for which the time taken to reach 95 % of the steady state current ( $T = 0.95$ ) is equal to 6 times the power P drawn by the load (with  $P \leq 50$  W).  
*Application example: switching the operating coil of all-in-one motor starters.*

<sup>(1)</sup> I<sub>r</sub> = protection module setting current.

<sup>(2)</sup> Replaces category AC-11.

<sup>(3)</sup> Replaces category DC-11.







**Coordination between protection and control components****Type of information****Page**

Types of coordination, according to the standard currents in the circuit to be considered

A6/2

Selection of the coordination type

A6/3

**Suggested coordinated Direct-On-Line motor starter combinations**

Fuse + contactors + thermal overload relay

A6/4

Circuit breaker (with built in overload protection) + contactors

A6/9

Circuit breaker + contactors + thermal overload relay

A6/11

**Suggested coordinated Star-delta motor starter combinations**

Fuse + contactors + thermal overload relay

A6/16

Circuit breaker (with built in overload protection) + contactors

A6/19

Circuit breaker + contactors + thermal overload relay

A6/21

**Suggested coordinated TeSys island motor starter combinations**

Protection Components / Starters - Coordination - IEC

A6/25

Protection Components / Starters - SCCR Ratings - UL

A6/32

**Contactors: Utilisation categories – Standard characteristics – Selection tables per categorie**

Definition: utilisation categories : AC-1, AC-2, AC-3, etc...

A6/33

Definition: contactor standard characteristics

A6/34

Contactor selection tables per utilisation categorie

A6/36

**Contactors for specific application – Design information**

Selection of contactors for lighting circuits

A6/50

Selection of contactors for heating circuits

A6/56

Selection of contactors for switching primaries of 3P LV/LV transformers

A6/58

Selection of contactors for switching 3P capacitor banks (factor correction)

A6/59

Selection of contactors auto-transformer starting

A6/60

Selection of contactors for rotor circuit of slip-ring motors

A6/62

Design of long distance remote control for contactors

A6/64

Current of asynchronous squirrel cage motors at nominal load

A6/68

**Standards – Protection against contact – Protective treatments**

International standards and certifications

A6/69

Protection against accidental direct contacts / IP codes

A6/71



### Type 1 and type 2 coordination according to the standard

The standard defines tests at different levels of current; the purpose of these tests is to place the equipment in extreme conditions.

The standard defines 2 types of coordination, according to the condition of the components after testing:

**type 1,**

**type 2.**

To determine the type of coordination, the standard requires that the behaviour of the equipment be tested under overload and short-circuit conditions for 3 fault current values, covering overload and short-circuit conditions.

### Type 1 coordination

Type 1 coordination requires that in a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and must not be able to resume operation without repair or the replacement of parts.

### Type 2 coordination

Type 2 coordination requires that in a short-circuit condition, the contactor or starter must not present any danger to personnel or installations and must subsequently be able to resume operation. The risk of contact welding is permissible; in this case, the manufacturer must indicate measures to be taken regarding maintenance of the equipment.

Type 2 coordination increases reliability of operation.

### Current values

#### Current “Ico” (overload $I < 10 I_n$ )

The thermal overload relay associated with the contactor provides protection against this type of fault, up to a value Ico (see curve) defined by the manufacturer.

Standard IEC 60947-4-1 specifies the 2 current values to be used for checking coordination between the thermal overload relay and the short-circuit protection device:

- at 0.75 Ico only the thermal overload relay must trip,
- at 1.25 Ico the short-circuit protection device must operate.

#### Current “r” (low level short-circuit $10 < I < 50 I_n$ )

The main cause of this type of fault is the deterioration of insulating materials. Standard IEC 60947-4-1 defines an intermediate short-circuit current “r”. This test current makes it possible to check whether the protection device is providing protection against low-level short-circuits.

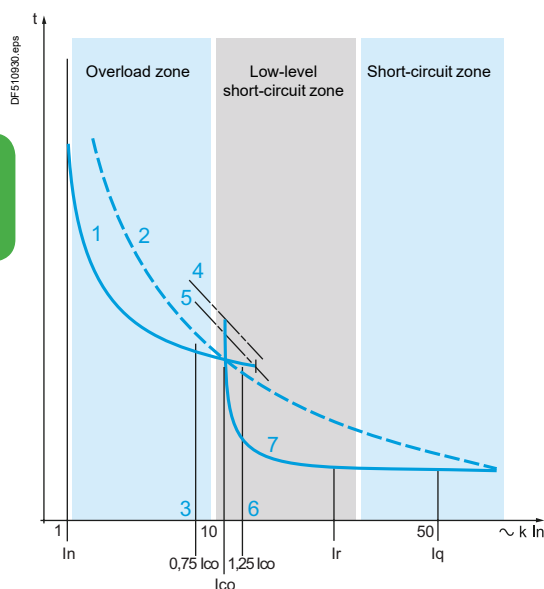
Operational current $I_e$ (AC-3) (A)	Current “r” (kA)
$I_e \leq 16$	1
$16 < I_e \leq 63$	3
$63 < I_e \leq 125$	5
$125 < I_e \leq 315$	10
$315 < I_e \leq 630$	18
$630 < I_e \leq 1000$	30

#### Current “Iq” (short-circuit > current “r”)

This type of fault corresponds to a dead short and is relatively rare. It can be caused by a connection error during maintenance work. Short-circuit protection is provided by fast operating devices.

Standard IEC 60947-4-1 defines a current “Iq”. The coordination tables supplied by Schneider Electric are based on a current “Iq” that is generally  $\geq 50$  kA.

(1) SCPD: short-circuit protection device.



- 1 Thermal overload relay curve.
- 2 Fuse.
- 3 Tripping of thermal overload relay only.
- 4 Thermal limit of the circuit breaker.
- 5 Thermal overload relay limit.
- 6 Current broken by the SCPD (1).
- 7 Circuit breaker magnetic trip.



#### Selection

##### No coordination

**Considerable risks to both persons and equipment.**

Not authorised by standards:

- ☐ NF C 15-100 and IEC 60364-1, article 133-1 (installation regulations),
- ☐ EN/IEC 60204-1, article 7 (electrical equipment in machines),
- ☐ IEC 60947-4-1, article 8.2.5. (starters)

##### Type 1 coordination

**The most frequently used solution.**

- Equipment costs are lower.
- Reliability of operation is not a requirement.
- Before restarting, it may be necessary to repair the motor starter.

Consequences:

- ☐ significant amount of machine downtime,
- ☐ skilled maintenance personnel required to repair, check, obtain supplies.

Example: air conditioning in commercial premises.

##### Type 2 coordination

**This solution ensures reliability of operation.**

Consequences:

- ☐ reduced machine downtime,
- ☐ reduced maintenance after a short-circuit.

Example: escalators.

##### Total coordination

**With this solution, no damage or misadjustment is permissible and reliability of operation is guaranteed.**

Consequences:

- ☐ immediate return to service,
- ☐ no special precautions required.

Examples: smoke extraction, fire-fighting pumps.



## 0.06 to 55 kW at 400/415 V: type 1 coordination

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Fuse carrier <sup>(1)</sup> (basic block)	aM fuses		Contactor	Thermal overload relay class 10	
400/415 V		440 V		500 V		Reference	Size	Rating	Reference <sup>(2)</sup>	Reference	Setting range
P	I <sub>e</sub>	P	I <sub>e</sub>	P	I <sub>e</sub>			A			A
kW	A	kW	A	kW	A						
0.06	0.2	0.06	0.19	–	–	LS1D32	10 x 38	2	LC1K06	LR2K0302	0.16...0.23
–	–	0.09	0.28	–	–	LS1D32	10 x 38	2	LC1K06	LR2K0303	0.23...0.36
0.09	0.3	–	–	–	–						
0.12	0.44	0.12	0.37	–	–	LS1D32	10 x 38	2	LC1K06	LR2K0304	0.36...0.54
0.18	0.6	0.18	0.55	–	–						
–	–	0.25	0.76	–	–	LS1D32	10 x 38	2	LC1K06	LR2K0305	0.54...0.8
0.25	0.85	–	–	–	–						
0.37	1.1	0.37	1	0.37	0.88	LS1D32	10 x 38	2	LC1K06	LR2K0306	0.8...1.2
0.55	1.5	0.55	1.36	0.55	1.2						
–	–	0.75	1.68	0.75	1.5	LS1D32	10 x 38	2	LC1K06	LR2K0307	1.2...1.8
0.75	1.9	–	–	1.1	2.2						
1.1	2.7	1.1	2.37	1.5	2.9	LS1D32	10 x 38	4	LC1K06	LR2K0308	1.8...2.6
1.5	3.6	1.5	3.06	–	–	LS1D32	10 x 38	4	LC1K06	LR2K0310	2.6...3.7
2.2	4.9	–	–	2.2	3.9						
–	–	–	–	3	5.2	LS1D32	10 x 38	6	LC1K06	LR2K0312	3.7...5.5
–	–	2.2	4.42	–	–	LS1D32	10 x 38	8	LC1K06	LR2K0312	3.7...5.5
3	6.5	3	5.77	4	6.8	LS1D32	10 x 38	8	LC1K09	LR2K0314	5.5...8
4	8.5	4	7.9	5.5	9.2	LS1D32	10 x 38	12	LC1K09	LR2K0316	8...11.5

<sup>(1)</sup> For breaking under load, add a rotary switch-disconnector.<sup>(2)</sup> For reversing operation, replace the prefix LC1 with LC2.



0.06 to 55 kW at 400/415 V: type 1 coordination											
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Fuse carrier <sup>(1)</sup> (basic block)	aM fuses		Contactor	Thermal overload relay classe 10	
400/415 V		440 V		500 V		Reference	Size	Rating	Reference <sup>(2)</sup>	Reference	Setting range
P	I <sub>e</sub>	P	I <sub>e</sub>	P	I <sub>e</sub>						
kW	A	kW	A	kW	A			A			A
5.5	11.5	5.5	10.4	7.5	12.4	LS1D32	10 x 38	16	LC1K12	LR2K0321	10...14
7.5	15.5	7.5	13.7	9	13.9	LS1D32	10 x 38	16	LC1D18	L RD21	12...18
–	–	9	16.9	–	–	LS1D32	10 x 38	20	LC1D25	L RD21	12...18
9	18.1	–	–	11	17.6	GK1EK	14 x 51	25	LC1D25	L RD22	16...24
11	22	11	20.1	15	23						
15	29	15	26.5	18.5	28	GK1EK	14 x 51	32	LC1D32	L RD32	23...32
18.5	35	18.5	32.8	22	33	GK1EK	14 x 51	40	LC1D40A	L RD340	30...40
22	41	22	39	30	44	GS●J	22 x 58	50	LC1D50A	L RD350	37...50
–	–	30	51.5	–	–	GS●J	22 x 58	80	LC1D50A	L RD365	48...65
–	–	–	–	37	53	GS●J	22 x 58	80	LC1D65A	L RD365	48...65
30	55	37	64	–	–	GS●J	22 x 58	80	LC1D65A	L RD365	48...65
–	–	–	–	45	64	GS●J	22 x 58	80	LC1D80	L RD3361	55...70
37 <sup>(3)</sup>	66	45	76	–	–	GS●J	22 x 58	100	LC1D80	L RD3363	63...80
45	80	–	–	55	78	GS●J	22 x 58	100	LC1D95	L RD3365	80...93
–	–	55	90	–	–	GS●J	22 x 58	125	LC1D115	L RD4365	80...104
55	97	–	–	75	106	GS●J	22 x 58	125	LC1D115	L RD4367	95...120

<sup>(1)</sup> For breaking under load, add a rotary switch-disconnector.

<sup>(2)</sup> For reversing operation, replace the prefix LC1 with LC2.

<sup>(3)</sup> 400 V maximum.



## 0.06 to 315 kW at 400/415 V: type 2 coordination

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Switch-disconnector	aM fuses		Contactor	Thermal overload relay classe 10	
400/415 V		440 V		500 V		Reference <sup>(1)</sup>	Size	Rating	Reference <sup>(2)</sup>	Reference	Setting range
P	I <sub>e</sub>	P	I <sub>e</sub>	P	I <sub>e</sub>			A			A
kW	A	kW	A	kW	A						
0.06	0.2	0.06	0.19	—	—	GS1DD	10 x 38	2	LC1D09	LRD02	0.16...0.25
—	—	0.09	0.28	—	—	GS1DD	10 x 38	2	LC1D09	LRD03	0.25...0.4
0.09	0.3	—	—	—	—						
0.12	0.44	0.12	0.37	—	—	GS1DD	10 x 38	2	LC1D09	LRD04	0.4...0.63
0.18	0.6	0.18	0.55	—	—						
—	—	0.25	0.76	—	—	GS1DD	10 x 38	2	LC1D09	LRD05	0.63...1
0.25	0.85	—	—	0.37	0.88						
0.37	1.1	0.37	1	0.55	1.2						
0.55	1.5	0.55	1.36	0.75	1.5	GS1DD	10 x 38	2	LC1D09	LRD06	1...1.7
0.75	1.9	0.75	1.68	—	—						
—	—	1.1	2.37	1.1	2.2	GS1DD	10 x 38	4	LC1D09	LRD07	1.6...2.5
1.1	2.7	—	—	1.5	2.9						
1.5	3.6	1.5	3.06	2.2	3.9	GS1DD	10 x 38	4	LC1D09	LRD08	2.5...4
2.2	4.9	2.2	4.42	3	5.2	GS1DD	10 x 38	6	LC1D09	LRD10	4...6
3	6.5	3	5.77	4	6.8	GS1DD	10 x 38	8	LC1D09	LRD12	5.5...8
4	8.5	4	7.9	5.5	9.2	GS1DD	10 x 38	10	LC1D09	LRD14	7...10
5.5	11.5	5.5	10.4	7.5	12.4	GS1DD	10 x 38	16	LC1D12	LRD16	9...13
7.5	15.5	7.5	13.7	9	13.9	GS1DD	10 x 38	16	LC1D18	LRD21	12...18
—	—	9	16.9	—	—	GS●F	14 x 51	20	LC1D25	LRD21	12...18
9	18.1	11	20.1	11	17.6						
11	22	—	—	15	23	GS●F	14 x 51	25	LC1D25	LRD22	16...24
15	29	15	26.5	18.5	28	GS●F	14 x 51	32	LC1D32	LRD32	23...32
18.5	35	18.5	32.8	22	33	GS●F	14 x 51	40	LC1D40A	LRD340	30...40
22	41	22	39	30	44	GS●J	22 x 58	50	LC1D50A	LRD350	37...50
—	—	30	51.5	—	—	GS●J	22 x 58	80	LC1D65A	LRD365	48...65
—	—	—	—	37	53	GS●J	22 x 58	80	LC1D65A	LRD365	48...65
30	55	37	64	—	—	GS●J	22 x 58	80	LC1D65A	LRD365	48...65
—	—	—	—	45	64	GS●J	22 x 58	80	LC1D95	LRD3361	55...70
37	66	45	76	—	—	GS●J	22 x 58	100	LC1D80	LRD3363	63...80
—	—	—	—	55	78	GS●J	22 x 58	100	LC1D115	LR9D5367	60...100
45	80	—	—	—	—	GS●J	22 x 58	100	LC1D95	LRD3365	80...93
55	97	55	90	75	106	GS●L	T0	125	LC1D150	LR9D5369	90...150
75	132	75	125	90	128	GS●L	T0	160	LC1D150	LR9D5369	90...150
90	160	90	146	110	156	GS●N	T1	200	LC1F185	LR9F5371	132...220
110	195	110	178	132	184	GS●N	T1	250	LC1F225	LR9F5371	132...220
132	230	132	215	160	224	GS●QQ	T2	315	LC1F265	LR9F7375	200...330
—	—	160	256	—	—	GS●QQ	T2	315	LC1F330	LR9F7375	200...330
160	280	200	321	200	280	GS●QQ	T2	400	LC1F330	LR9F7375	200...330
—	—	—	—	220	310	GS●QQ	T2	400	LC1F400	LR9F7375	200...330
200	350	—	—	—	—						
220	388	220	353	250	344	GS2S	T3	500	LC1F400	LR9F7379	300...500
250	430	250	401	—	—	GS2S	T3	500	LC1F500	LR9F7379	300...500
—	—	—	—	315	432						
—	—	—	—	355	488	GS2S	T3	630	LC1F500	LR9F7381	380...630
315	540	315	505	—	—	GS2S	T3	630	LC1F630	LR9F7381	380...630
—	—	355	549	—	—						
—	—	400	611	400	552	GS2V	T4	800	LC1F630	LR9F7381	380...630

(1) GS●: GS1 for direct operator or GS2 for external operator.

(2) For reversing operation, replace the prefix LC1 with LC2.



0.75 to 400 kW at 690 V: type 2 coordination							
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3		Switch-disconnector	aM fuses		Contactor	Thermal overload relay classe 10	
P	I <sub>e</sub>	Reference <sup>(1)</sup>	Size	Rating	Reference <sup>(2)</sup>	Reference	Setting range
kW	A			A			A
0.75	1.1	GS●F	14 x 51	2	LC1D09	LRD06	1...1.6
1.1	1.6	GS●F	14 x 51	2	LC1D09	LRD06	1...1.6
1.5	2.1	GS●F	14 x 51	4	LC1D09	LRD07	1.6...2.5
2.2	2.8	GS●F	14 x 51	4	LC1D09	LRD08	2.5...4
3	3.8	GS●F	14 x 51	6	LC1D09	LRD08	2.5...4
4	4.9	GS●F	14 x 51	6	LC1D09	LRD10	4...6
5.5	6.7	GS●F	14 x 51	8	LC1D09	LRD12	5.5...8
7.5	8.9	GS●F	14 x 51	10	LC1D25	LRD16	9...13
11	12.8	GS●F	14 x 51	16	LC1D25	LRD16	9...13
15	17	GS●F	14 x 51	20	LC1D25	LRD22	16...24
18.5	21	GS●F	14 x 51	25	LC1D32	LRD22	16...24
22	24	GS●J	22 x 58	32	LC1D40A	LRD332	23...32
30	32	GS●J	22 x 58	40	LC1D40A	LRD340	30...40
37	39	GS●J	22 x 58	50	LC1D65A	LRD350	37...50
45	47	GS●J	22 x 58	63	LC1D80	LRD3357	37...50
55	57	GS●J	22 x 58	80	LC1D115	LRD3359	48...65
75	77	GS●KK	T00	100	LC1D115	LRD3363	63...80
90	93	GS●KK	T00	125	LC1D150	LR9D5369	90...150
110	113	GS●KK	T00	125	LC1F185	LR9D5369	90...150
132	134	GS●L	T0	160	LC1F265	LR9F5371	132...220
160	162	GS●N	T1	200	LC1F265	LR9F5371	132...220
200	203	GS●N	T1	250	LC1F330	LR9F7375	200...330
220	224	GS●QQ	T2	250	LC1F400	LR9F7375	200...330
250	250	GS●QQ	T2	315	LC1F400	LR9F7375	200...330
315	313	GS●QQ	T2	355	LC1F500	LR9F7379	300...500
355	354	GS●QQ	T2	400	LC1F630	LR9F7379	300...500
400	400	GS2S	T3	500	LC1F630	LR9F7379	300...500

(1) GS●: GS1 for direct operator or GS2 for external operator.

(2) For reversing operation, replace the prefix LC1 with LC2.



0.18 to 55 kW at 400/415 V: type 2 coordination											
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Switch- disconnecter	aM fuses		Contactor	Electronic thermal overload relay	
400/415 V			690 V			Reference	Size	Rating	Reference	Reference	Setting range
P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>						
kW	A	kA	kW	A	kA			A			A
0.18	0.6	100	–	–	–	GS1DD	10 x 38	2	LC1D09	LR9D02	0.4...2.0
0.25	0.85	100	–	–	–	GS1DD	10 x 38	2	LC1D09	LR9D02	0.4...2.0
0.37	1.1	100	–	–	–	GS1DD	10 x 38	2	LC1D09	LR9D02	0.4...2.0
0.55	1.5	100	–	–	–	GS1DD	10 x 38	2	LC1D09	LR9D02	0.4...2.0
0.75	1.9	100	–	–	–	GS1DD	10 x 38	4	LC1D09	LR9D02	0.4...2.0
1.1	2.7	100	–	–	–	GS1DD	10 x 38	4	LC1D18	LR9D08	1.6...8.0
1.5	3.6	100	–	–	–	GS1DD	10 x 38	4	LC1D18	LR9D08	1.6...8.0
2.2	4.9	100	–	–	–	GS1DD	10 x 38	6	LC1D18	LR9D08	1.6...8.0
3	6.5	100	–	–	–	GS1DD	10 x 38	8	LC1D18	LR9D32	6.4...32
4	8.5	100	–	–	–	GS1DD	10 x 38	10	LC1D18	LR9D32	6.4...32
5.5	11.5	100	–	–	–	GS1DD	10 x 38	16	LC1D25	LR9D32	6.4...32
7.5	15.5	50	–	–	–	GS1DD	10 x 38	16	LC1D25	LR9D32	6.4...32
11	22	50	–	–	–	GS●F	14 x 51	25	LC1D25	LR9D32	6.4...32
15	29	50	–	–	–	GS●J	22 x 58	32	LC1D65A	LR9D110S	22...110
18.5	35	50	–	–	–	GS●J	22 x 58	40	LC1D65A	LR9D110S	22...110
22	41	50	–	–	–	GS●J	22 x 58	50	LC1D65A	LR9D110S	22...110
45 <sup>(1)</sup>	80	100	–	–	–	GS●N	T 1	100	LC1D150	LR9D110S	22...110
55 <sup>(1)</sup>	97	100	–	–	–	GS●N	T 1	125	LC1D150	LR9D110S	22...110
–	–	–	0.37	0.64	100	GS●F	14 x 51	2	LC1D09	LR9D02	0.4...2.0
–	–	–	0.55	0.87	100	GS●F	14 x 51	2	LC1D09	LR9D02	0.4...2.0
–	–	–	0.75	1.1	100	GS●F	14 x 51	2	LC1D09	LR9D02	0.4...2.0
–	–	–	1.1	1.6	100	GS●F	14 x 51	2	LC1D25	LR9D08	1.6...8.0
–	–	–	1.5	2.1	100	GS●F	14 x 51	4	LC1D25	LR9D08	1.6...8.0
–	–	–	2.2	2.8	100	GS●F	14 x 51	4	LC1D25	LR9D08	1.6...8.0
–	–	–	3	4	100	GS●F	14 x 51	6	LC1D25	LR9D08	1.6...8.0
–	–	–	4	5	100	GS●F	14 x 51	6	LC1D25	LR9D08	1.6...8.0
–	–	–	5.5	7	50	GS●F	14 x 51	8	LC1D25	LR9D32	6.4...32
–	–	–	7.5	8.9	50	GS●F	14 x 51	10	LC1D25	LR9D32	6.4...32
–	–	–	11	13	50	GS●F	14 x 51	16	LC1D32	LR9D32	6.4...32
–	–	–	15	16.5	50	GS●F	14 x 51	20	LC1D32	LR9D32	6.4...32
–	–	–	18.5	21	100	GS●F	14 x 51	25	LC1D95	LR9D32	6.4...32
–	–	–	18.5	21	50	GS●F	14 x 51	25	LC1D65A	LR9D32	6.4...32
–	–	–	22	25	50	GS●F	14 x 51	32	LC1D65A	LR9D32	6.4...32
–	–	–	30	33	100	GS●F	14 x 51	40	LC1D95	LR9D110	22...110
–	–	–	37	40	100	GS●F	14 x 51	50	LC1D95	LR9D110	22...110
–	–	–	45	49	100	GS●J	22 x 58	63	LC1D95	LR9D110	22...110

<sup>(1)</sup> Ratings valid up to 400 V AC only.



0.06 to 375 kW at 415 V: type 2 coordination											
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Switch-disconnector-fuse	BS fuses		Contactor	Thermal overload relay	
415 V		440 V		500 V		Reference	Size	Rating	Reference <sup>(1)</sup>	Reference	Setting range
P	I <sub>e</sub>	P	I <sub>e</sub>	P	I <sub>e</sub>						
kW	A	kW	A	kW	kA			A			A
0.06	0.22	0.06	0.19	—	—	GS1DDB	A1	NIT 2	LC1D09	LRD02	0.16...0.25
—	—	0.09	0.28	—	—	GS1DDB	A1	NIT 2	LC1D09	LRD03	0.25...0.4
0.09	0.36	—	—	—	—						
0.12	0.42	0.12	0.37	—	—	GS1DDB	A1	NIT 2	LC1D09	LRD04	0.4...0.63
0.18	0.6	0.18	0.55	—	—	GS1DDB	A1	NIT 2	LC1D09	LRD05	0.63...1
—	—	0.25	0.76	—	—	GS1DDB	A1	NIT 4	LC1D09	LRD05	0.63...1
0.25	0.88	0.37	1	0.37	1						
0.37	1	0.55	1.36	0.55	1.2						
0.55	1.5	0.75	1.68	0.75	1.5	GS1DDB	A1	NIT 6	LC1D09	LRD06	1...1.7
0.75	2	—	—	—	—	GS1DDB	A1	NIT 10	LC1D09	LRD07	1.6...2.5
—	—	—	—	1.5	2.6	GS1DDB	A1	NIT 10	LC1D09	LRD08	2.5...4
1.5	3.5	1.5	3.06	2.2	3.8	GS1DDB	A1	NIT 16	LC1D09	LRD08	2.5...4
2.2	5	2.2	4.42	3	5	GS1DDB	A1	NIT 16	LC1D09	LRD10	4...6
3	6.5	3	5.77	4	6.5	GS1DDB	A1	NIT 20	LC1D09	LRD12	5.5...8
4	8.4	4	7.9	5.5	9	GS1DDB	A1	NIT 20	LC1D09	LRD14	7...10
5.5	11	5.5	10.4	7.5	12	GS1DDB	A1	NIT 20M25	LC1D12	LRD16	9...13
7.5	14	7.5	13.7	9	13.9	GS1DDB	A1	NIT 20M32	LC1D18	LRD21	12...18
9	18.1	9	16.9	—	—	GS2GB	A2	TIA 32M35	LC1D18	LRD21	12...18
11	21	11	20	11	18.4						
—	—	—	—	15	23	GS2GB	A2	TIA 32M50	LC1D25	LRD22	16...24
15	28.5	15	26.5	—	—	GS2GB	A2	TIA 32M63	LC1D32	LRD32	23...32
18.5	35	18.5	32.8	—	—	GS2GB	A3	TIS 63M80	LC1D40A	LRD340	25...40
22	41	22	39	—	—	GS2GB	A3	TIS 63M80	LC1D50A	LRD350	37...50
30	55	30	51.5	—	—	GS2GB	A3	TIS 63M100	LC1D65A	LRD365	48...65
—	—	37	64	—	—	GS2GB	A3	TIS 63M100	LC1D65A	LRD365	48...65
—	—	45	76	45	65	GS2LLB	A4	TCP 100M125	LC1D80	LRD3363	63...80
45	81	—	—	55	80	GS2LLB	A4	TCP 100M125	LC1D95	LRD3365	80...93
55	100	—	—	—	—	GS2LLB	A4	TCP 100M160	LC1D115	LR9D5369	90...150
—	—	55	90	—	—	GS2LLB	A4	TCP 100M160	LC1D115	LR9D5367	60...100
—	—	—	—	80	116	GS2LB	B2	TF 200	LC1D150	LR9D5369	90...150
80	138	80	132	—	—	GS2LB	B2	TF 200M250	LC1D150	LR9D5369	90...150
—	—	—	—	100	143						
—	—	—	—	110	156	GS2LB	B2	TF 200M250	LC1F185	LR9F5371	132...220
100	182	100	162	—	—	GS2MMB	B2	TF 200M250	LC1F185	LR9F5371	132...220
110	196	110	178	—	—	GS2MMB	B2	TF 200M315	LC1F225	LR9F5371	132...220
—	—	—	—	140	200	GS2NB	B3	TKF 315M355	LC1F265	LR9F5371	132...220
140	250	140	226	160	220	GS2NB	B3	TKF 315M355	LC1F265	LR9F7375	200...330
160	285	160	256	—	—	GS2QQB	B4	TKF 315M355	LC1F330	LR9F7375	200...330
—	—	—	—	220	310	GS2QQB	B4	TMF 400	LC1F400	LR9F7379	300...500
220	388	220	353	257	362	GS2QQB	B4	TMF 400M450	LC1F400	LR9F7379	300...500
—	—	—	—	270	380	GS2SB	C2	TTM 500	LC1F500	LR9F7379	300...500
257	450	257	412	—	—						
270	460	270	433	—	—	GS2SB	C2	TTM 500	LC1F500	LR9F7381	380...630
375	610	375	577	375	508						
—	—	—	—	425	556	GS2SB	C2	TTM 630	LC1F630	LR9F7381	380...630

(1) For reversing operation, replace the prefix LC1 with LC2.



## 0.06 to 250 kW at 400/415 V: type 1 coordination

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Circuit breaker		Contactor
400/415 V			440 V			500 V			Reference <i>References in italics are available in CEE zone only</i>	Setting range of thermal trips	Reference <sup>(2)</sup>
P	I <sub>e</sub>	I <sub>q</sub> <sup>(1)</sup>	P	I <sub>e</sub>	I <sub>q</sub> <sup>(1)</sup>	P	I <sub>e</sub>	I <sub>q</sub> <sup>(1)</sup>		A	
kW	A	kA	kW	A	kA	kW	A	kA			
0.06	0.2	50	0.06	0.19	50	—	—	—	GV2ME02 GV2ME02AP	0.16...0.25	LC1K06 or LC1D09
0.09	0.3	50	0.09 0.12	0.28 0.37	50 50	—	—	—	GV2ME03 GV2ME03AP	0.25...0.40	LC1K06 or LC1D09
0.12 0.18	0.44 0.6	50 50	— 0.18	— 0.55	— 50	— —	— —	—	GV2ME04 GV2ME04AP	0.40...0.63	LC1K06 or LC1D09
0.25 0.37	0.85 1.1	50 50	0.25 0.37	0.76 0.99	50 50	—	—	—	GV2ME05 GV2ME05AP	0.63...1	LC1K06 or LC1D09
—	—	—	—	—	—	0.37	0.88	50	GV2ME06	1...1.6	LC1K06 or LC1D09
0.55	1.5	50	0.55	1.36	50	0.55	1.2	50	GV2ME06AP	1...1.6	LC1K06 or LC1D09
—	—	—	—	—	—	0.75	1.5	50	GV2ME06 GV2ME06AP	1...1.6	LC1K06 or LC1D09
0.75	1.9	50	0.75	1.68	50	—	—	—	GV2ME07	1.6...2.5	LC1K06 or LC1D09
—	—	—	1.1	2.37	50	1.1	2.2	50	GV2ME07AP	1.6...2.5	LC1K06 or LC1D09
1.1 1.5	2.7 3.6	50 50	— 1.5	— 3.06	— 50	1.5 2.2	2.9 3.9	50 50	GV2ME08 GV2ME08AP	2.5...4	LC1K06 or LC1D09
2.2	4.9	50	2.2	4.42	50	—	—	—	GV2ME10	4...6.3	LC1K06 or LC1D09
—	—	—	3	5.77	50	3	5.2	50	GV2ME10AP	4...6.3	LC1K06 or LC1D09
3	6.5	50	—	—	—	4	6.8	10	GV2ME14	6...10	LC1K09 or LC1D09
4	8.5	50	4	7.9	15	5.5	9.2	10	GV2ME14AP	6...10	LC1K09 or LC1D09
5.5	11.5	15	5.5	10.4	8	7.5	12.4	6	GV2ME16 GV2ME16AP	9...14	LC1K12 or LC1D12
7.5	15.5	15	7.5	13.7	8	9	13.9	6	GV2ME20	13...18	LC1D18
—	—	—	9	16.9	8	—	—	—	GV2ME20AP	13...18	LC1D18
9	18.1	15	11	20.1	6	11	17.6	4	GV2ME21	17...23	LC1D25
—	—	—	—	—	—	—	—	—	GV2ME21AP	17...23	LC1D25
11	22	15	—	—	—	15	23	4	GV2ME22	20...25	LC1D25
—	—	—	—	—	—	—	—	—	GV2ME22AP	20...25	LC1D25
15	29	10	15	26.5	6	18.5	28	4	GV2ME32	24...32	LC1D32
—	—	—	—	—	—	—	—	—	GV2ME32AP	24...32	LC1D32
18.5	35	50	18.5	32.8	50	22	33	10	GV3P40	30...40	LC1D40A
22	41	50	22	39	50	30	44	10	GV3P50	37...50	LC1D50A
30	55	50	30	51.5	50	37	53	10	GV3P65	48...65	LC1D65A
37	66	50	—	—	—	—	—	—	GV3P73	62...73	LC1D80A
—	—	—	37	64	70	45	64	30	GV4P80	40...80	LC1D65A
37	66	100	45	76	70	55	78	30	GV4P80	40...80	LC1D80
45	80	100	—	—	—	—	—	—	GV4P115	65...115	LC1D95
55	97	100	55	90	70	75	106	30	GV4P115	65...115	LC1D115
75	132	36	75	125	35	90	128	30	GV5P150F	70...150	LC1D150
—	—	—	90	146	35	—	—	—	GV5P150F	70...150	LC1F185
90	160	36	—	—	—	110	156	30	GV5P220F	100...220	LC1F185
110	195	36	—	—	—	—	—	—	GV5P220F	100...220	LC1F225
160	280	36	318	280	35	—	—	—	GV6P320F	160...320	LC1F330
—	—	—	—	—	—	220	308	30	GV6P320F	160...320	LC1F400
200	350	36	220	318	35	—	—	—	GV6P500F	250...500	LC1F400
250	430	36	250	401	35	335	460	30	GV6P500F	250...500	LC1F500

(1) The breaking performance of circuit breakers GV2ME can be increased by adding a current limiter GV1L3.

(2) For reversing operation, replace the prefix LC1 with LC2.



0.06 to 250 kW at 400/415 V: type 2 coordination											
Standard power ratings of 3-phase motors 50/60 Hz in categ or y AC-3									Circuit breaker	Setting range of thermal trips	Contactor Reference <sup>(2)</sup>
400/415 V			440 V			500 V			Reference <i>References in italics are available in CEE zone only</i>	A	
P	I <sub>e</sub>	I <sub>q</sub> <sup>(1)</sup>	P	I <sub>e</sub>	I <sub>q</sub> <sup>(1)</sup>	P	I <sub>e</sub>	I <sub>q</sub> <sup>(1)</sup>			
kW	A	kA	kW	A	kA	kW	A	kA			
0.06	0.2	130	0.06	0.19	130	—	—	—	GV2P02 or GV2ME02 or GV2ME02AP	0.16...0.25	LC1D09
—	—	—	0.09	0.28	130	—	—	—	GV2P03 or GV2ME03 or GV2ME03AP	0.25...0.4	LC1D09
0.09	0.3	130	0.12	0.37	130	—	—	—	GV2P04 or GV2ME04 or GV2ME04AP	0.4...0.63	LC1D09
0.12	0.44	130	—	—	—	—	—	—	GV2P05 or GV2ME05 or GV2ME05AP	0.63...1	LC1D09
0.18	0.6	130	0.18	0.55	130	—	—	—	GV2P06 or GV2ME06 or GV2ME06AP	1...1.6	LC1D09
0.25	0.85	130	0.25	0.76	130	—	—	—	GV2P07 or GV2ME07 or GV2ME07AP	1.6...2.5	LC1D09
0.37	1.1	130	0.37	0.99	130	—	—	—	GV2P08 or GV2ME08 or GV2ME08AP	2.5...4	LC1D09
—	—	—	—	—	—	0.37	0.88	130	GV2P10 or GV2ME10 or GV2ME10AP	4...6.3	LC1D09
0.55	1.5	130	0.55	1.36	130	0.55	1.2	130	GV2ME10 or GV2ME10AP	4...6.3	LC1D09
—	—	—	—	—	—	0.75	1.5	130	GV2P14	6...10	LC1D09
0.75	1.9	130	0.75	1.68	130	—	—	—	GV2P16 or GV2ME16 or GV2ME16AP	9...14	LC1D25
—	—	—	1.1	2.37	130	1.1	2.2	130	GV2P20 or GV2ME20 or GV2ME20AP	13...18	LC1D25
1.1	2.7	130	—	—	—	1.5	2.9	130	GV2P21 or GV2ME21 or GV2ME21AP	17...23	LC1D25
1.5	3.6	130	1.5	3.06	130	2.2	3.9	130	GV2P22 or GV2ME22 or GV2ME22AP	20...25	LC1D25
—	—	—	—	—	—	—	—	—	GV2P22	20...25	LC1D32
2.2	4.9	130	—	—	—	—	—	—	GV2P32 or GV2ME32 or GV2ME32AP	24...32	LC1D32
—	—	—	2.2	4.42	50	—	—	—	GV3P40	30...40	LC1D50A
—	—	—	3	5.77	50	3	5.2	50	GV3P40	30...40	LC1D65A
—	—	—	2.2	4.42	130	—	—	—	GV3P50	37...50	LC1D50A
—	—	—	3	5.77	130	3	5.2	130	GV3P50	37...50	LC1D65A
3	6.5	130	—	—	—	—	—	—	GV3P65	48...65	LC1D65A
4	8.5	130	—	—	—	—	—	—	GV3P65	48...65	LC1D65A
—	—	—	4	7.9	15	4	6.8	10	GV3P73	62...73	LC1D80A
—	—	—	—	—	—	5.5	9.2	10	GV4P80	40...80	LC1D65A
—	—	—	4	7.9	130	4	6.8	50	GV4P80	40...80	LC1D80
—	—	—	—	—	—	5.5	9.2	50	GV4P115	65...115	LC1D115/F115
5.5	11.5	130	5.5	10.4	50 or 8	7.5	12.4	42 or 6	GV5P150H	70...150	LC1D150
—	—	—	7.5	13.7	50 or 8	9	13.9	42 or 6	GV5P220H	100...220	LC1F225
7.5	15.5	50 or 15	9	16.9	20 or 8	—	—	—	GV5P220H	100...220	LC1F225
9	18.1	50 or 15	11	20.1	20 or 8	11	17.6	10 or 6	GV6P320H	160...320	LC1F265
11	22	50 or 15	—	—	—	—	—	—	GV6P320H	160...320	LC1F330
—	—	—	—	—	—	15	23	10 or 6	GV6P500H	250...500	LC1F500
15	29	50 or 10	15	26.5	20 or 6	18.5	28	10 or 4			
18.5	35	50	—	—	—	—	—	—			
—	—	—	18.5	32.8	50	22	33	10			
22	41	50	—	—	—	—	—	—			
—	—	—	22	39	50	30	44	10			
30	55	50	30	51.5	50	—	—	—			
—	—	—	—	—	—	37	53	10			
37	66	50	—	—	—	—	—	—			
—	—	—	37	64	70	—	—	—			
37	66	100	45	76	70	(3)	(3)	(3)			
45	80	100	55	90	70	(3)	(3)	(3)			
55	97	100	—	—	—	(3)	(3)	(3)			
75	132	70	75	125	65	—	—	—			
90	160	70	110	178	65	—	—	—			
110	195	70	—	—	—	—	—	—			
132	230	70	160	256	65	—	—	—			
160	280	70	200	318	65	—	—	—			
220	385	70	250	450	65	—	—	—			
250	450	70	300	473	65	—	—	—			

(1) The breaking performance of circuit breakers GV2P can be increased by adding a current limiter GV1L3.

(2) Combinations with circuit breaker GV2ME are type 2 co or dinated only at 400/415 V and 440 V.

(3) Please consult your regional sales office.



**½ to 80 hp at 460 V - 3P**

GV2P + contactor: compact, high SCCR solution.

GV3P + contactor: medium power, Everlink (long lasting power connection).

GV4PB + contactor: high power, advanced protection settings, Everlink (long lasting power connection), 18 (GV4PB●●●B), 35 (GV4PB●●●N) or 65 (GV4PB●●●S) kA SCCR.

Standard power ratings						Circuit breaker		Contactor		Circuit breaker		Contactor		Circuit breaker		Contactor					
200 V 3P		230 V 3P		460 V 3P		Product reference (2)	Dial range	Product reference (3)	Comb. SCCR 480Y	Product reference (4)	Dial range	Product reference (3)	Comb. SCCR 480Y	Product reference	Dial range	Product reference (3)	SCCR 480Y As applied				
HP	FLA (1)	HP	FLA (1)	HP	FLA (1)																
						A	kA	A		kA	A		kA								
						½	1.1	GV2P06	1 to 1.6	LC1D09	100			GV4PB02S	0.8 to 2	LC1D09	65				
						¾	1.6	GV2P06	1 to 1.6	LC1D09	100			GV4PB02S	0.8 to 2	LC1D09	65				
½	2.5	½	2.2	1	2.1	GV2P07	1.6 to 2.5	LC1D09	100					GV4PB03S	1.4 to 3.5	LC1D09	65				
						1½	3	GV2P08	2.5 to 4	LC1D09	100			GV4PB03S	1.4 to 3.5	LC1D09	65				
¾	3.7	¾	3.2	2	3.4	GV2P08	2.5 to 4	LC1D09	100					GV4PB07S	2.9 to 7	LC1D09	65				
1	4.6	1	4.2	3	4.8	GV2P10	4 to 6.3	LC1D09	100					GV4PB07S	2.9 to 7	LC1D09	65				
						1½	6	GV2P10	4 to 6.3	LC1D09	100			GV4PB12S	5 to 12.5	LC1D12	65				
1½	6.9	2	6.8			GV2P14	6 to 10	LC1D12	100					GV4PB12S	5 to 12.5	LC1D12	65				
2	7.8			5	7.6	GV2P14	6 to 10	LC1D12	100					GV4PB12S	5 to 12.5	LC1D12	65				
						3	9.6	GV2P14	6 to 10	LC1D12	100	GV3P13	9 to 13	LC1D18	65	GV4PB12S	5 to 12.5	LC1D12	65		
3	11			7½	11	GV2P16	9 to 14	LC1D18	50 (5)	GV3P13	9 to 13	LC1D18	65	GV4PB25S	10 to 25	LC1D25	65				
						10	14	GV2P16	9 to 14	LC1D18	50 (5)	GV3P18	12 to 18	LC1D18	65	GV4PB25S	10 to 25	LC1D25	65		
5	17.5	5	15.2			GV2P20	13 to 18	LC1D18	50 (5)	GV3P18	12 to 18	LC1D18	65	GV4PB25S	10 to 25	LC1D25	65				
						7½	22	15	21	GV2P21	17 to 23	LC1D25	50 (5)	GV3G25	17 to 25	LC1D25	65	GV4PB25S	10 to 25	LC1D25	65
7½	25.3					GV2P22	20 to 25	LC1D25	50 (5)	GV3P32	23 to 32	LC1D32	65	GV4PB50S	20 to 50	LC1D50A	65				
						10	28	20	27			GV3P32	23 to 32	LC1D32	65	GV4PB50S	20 to 50	LC1D50A	65		
10	32.2			25	34					GV3P40	30 to 40	LC1D40A	65	GV4PB50S	20 to 50	LC1D50A	65				
						15	42	30	40			GV3P50	37 to 50	LC1D50A	65	GV4PB50S	20 to 50	LC1D50A	65		
15	48									GV3P65	48 to 65	LC1D65A	65	GV4PB50S	20 to 50	LC1D50A	65				
						20	54	40	52			GV3P65	48 to 65	LC1D65A	65	GV4PB80S	40 to 80	LC1D80	65		
20	62.1													GV4PB115S	40 to 80	LC1D80	65				
25	78.2	25	68	50	65									GV4PB115S	40 to 80	LC1D80	65				
30	92	30	80	60	77									GV4PB115S	65 to 115	LC1D115	65				

(1) Motor Full Load Amp Sizes are based on NEC Table 430.250.

(2) Requires use of GV1G09 or GV2GH7 line spacer for Type F rating.

(3) Add coil suffix to complete reference part number. For example, an LC1D09G7 includes a 120 V AC coil.

(4) Requires use of GV3G66 line spacer and GVAM11 short-circuit signaling contact for Type F rating.

(5) SCCR is 42 kA at 480Y when using GV2G busbar links.



0.06 to 250 kW at 400/415 V: type 1 coordination														
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Circuit breaker			Contactor	Thermal overload relay	
400/415 V			440 V			500 V			Reference	Rating	I <sub>rm</sub> <sup>(1)</sup>	Reference <sup>(2)</sup>	Reference	Setting range
P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>		A	A			A
kW	A	kA	kW	A	kA	kW	A	kA						
0.06	0.2	50	0.06	0.19	50	–	–	–	GV2LE03	0.4	5	LC1K06	LR2K0302	0.16...0.23
–	–	–	0.09	0.28	50	–	–	–	GV2LE03	0.4	5	LC1K06	LR2K0303	0.23...0.36
0.09	0.3	50	0.12	0.37	50	–	–	–	GV2LE03	0.4	5	LC1K06	LR2K0304	0.36...0.54
0.12	0.44	50	–	–	–	–	–	–	GV2LE04	0.63	8	LC1K06	LR2K0304	0.36...0.54
0.18	0.6	50	0.18	0.55	50	–	–	–	GV2LE04	0.63	8	LC1K06	LR2K0305	0.54...0.8
–	–	–	0.25	0.76	50	–	–	–	GV2LE05	1	13	LC1K06	LR2K0305	0.54...0.8
0.25	0.85	50	–	–	–	–	–	–	GV2LE05	1	13	LC1K06	LR2K0306	0.8...1.2
0.37	1.1	50	0.37	1	50	0.37	0.88	50	GV2LE06	1.6	22.5	LC1K06	LR2K0307	1.2...1.8
0.55	1.5	50	0.55	1.36	50	0.55	1.2	50	GV2LE06	1.6	22.5	LC1K06	LR2K0307	1.2...1.8
–	–	–	–	–	–	0.75	1.5	50	GV2LE07	2.5	33.5	LC1K06	LR2K0307	1.2...1.8
–	–	–	0.75	1.68	50	–	–	–	GV2LE07	2.5	33.5	LC1K06	LR2K0308	1.8...2.6
0.75	1.9	50	–	–	–	–	–	–	GV2LE07	2.5	33.5	LC1K06	LR2K0308	1.8...2.6
1.1	2.7	50	1.1	2.37	50	1.1	2.2	50	GV2LE08	4	51	LC1K06	LR2K0310	2.6...3.7
1.5	3.6	50	1.5	3.06	50	1.5	2.9	50	GV2LE08	4	51	LC1K06	LR2K0312	3.7...5.5
–	–	–	–	–	–	2.2	3.9	50	GV2LE08	4	51	LC1K06	LR2K0312	3.7...5.5
2.2	4.9	50	2.2	4.4	50	3	5.2	50	GV2LE10	6.3	78	LC1K06	LR2K0312	3.7...5.5
–	–	–	3	5.77	50	–	–	–	GV2LE10	6.3	78	LC1K06	LR2K0314	5.5...8
–	–	–	4	7.9	15	–	–	–	GV2LE14	10	138	LC1K09	LR2K0314	5.5...8
3	6.5	50	–	–	–	4	6.8	10	GV2LE14	10	138	LC1K09	LR2K0314	5.5...8
4	8.5	50	–	–	–	–	–	–	GV2LE14	10	138	LC1K09	LR2K0316	8...11.5
5.5	11.5	15	5.5	10.4	8	7.5	12.4	6	GV2LE16	14	170	LC1K12	LR2K0321	10...14
–	–	–	7.5	13.7	8	9	13.9	6	GV2LE16	14	170	LC1D18	LRD21	12...18
7.5	15.5	15	9	16.9	8	–	–	–	GV2LE20	18	223	LC1D18	LRD21	12...18
9	18.1	15	–	–	–	11	17.6	4	GV2LE22	25	327	LC1D25	LRD22	16...24
11	22	15	11	20.1	6	15	23	4	GV2LE22	25	327	LC1D25	LRD22	16...24
15	29	10	15	26.5	6	18.5	28	4	GV2LE32	32	416	LC1D32	LRD32	23...32
18.5	35	50	18.5	32.5	50	22	33	10	GV3L40	40	560	LC1D40A	LRD340	30...40
22	41	50	22	39	50	30	44	10	GV3L50	50	700	LC1D50A	LRD350	37...50

(1) I<sub>rm</sub>: setting current of the magnetic trip.

(2) For reversing operation, replace the prefix LC1 with LC2.



## 0.06 to 250 kW at 400/415 V: type 1 coordination

Standard power ratings of 3-phase motors  
50/60 Hz in category AC-3

									Circuit breaker			Contactor	Thermal overload relay	
400/415 V			440 V			500 V			Reference	Rating	I <sub>rm</sub> <sup>(1)</sup>	Reference <sup>(2)</sup>	Reference	Setting range
P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>		A	A			A
kW	A	kA	kW	A	kA	kW	A	kA						
30	55	50	30	51.5	50	37	53	10	GV3L65	65	910	LC1D65A	LRD365	48...65
–	–	–	37	64	50	37	53	10	GV3L65	65	910	LC1D65A	LRD365	48...65
–	–	–	–	–	–	45	64	50	GV3L65	65	910	LC1D80	LRD3361	48...65
37	66	50	–	–	–	–	–	–	GV3L73	73	1120	LC1D80A	LRD380	62...80
–	–	–	37	64	70	–	–	–	GV4L80	80	880	LC1D65A	LRD365	48...65
–	–	–	–	–	–	45	64	30	GV4L80	80	880	LC1D80	LRD3361	48...65
37	66	100	–	–	–	–	–	–	GV4L80	80	1040	LC1D80	LRD3361	48...65
–	–	–	45	76	70	55	78	30	GV4L80	80	1040	LC1D80	LRD3363	63...80
45	80	100	–	–	–	–	–	–	GV4L115	115	1380	LC1D95	LRD3365	80...104
–	–	–	–	–	–	75	106	30	GV4L115	115	1380	LC1D115	LRD4367	95...120
–	–	–	55	90	70	–	–	–	GV4L115	115	1380	LC1D115	LRD4365	80...104
55	97	100	–	–	–	–	–	–	GV4L115	115	1495	LC1D115	LRD4367	95...120
–	–	–	–	–	–	50	90	<sup>(3)</sup>	NSX100●MA <sup>(3)</sup>	100	1200	LC1D115	LRD4365	80...104
–	–	–	–	–	–	75	106	<sup>(3)</sup>	NSX160●MA <sup>(3)</sup>	150	1500	LC1D115	LRD4367	95...120
55	97	<sup>(3)</sup>	–	–	–	–	–	–	NSX160●MA <sup>(3)</sup>	150	1350	LC1D115	LRD4367	95...120
75	132	<sup>(3)</sup>	75	125	<sup>(3)</sup>	90	128	<sup>(3)</sup>	NSX160●MA <sup>(3)</sup>	150	1800	LC1D150	LRD4369	110...140
–	–	–	90	146	<sup>(3)</sup>	–	–	–	NSX160●MA <sup>(3)</sup>	150	1950	LC1F185	LR9F5371	132...220
90	160	<sup>(3)</sup>	–	–	–	110	156	<sup>(3)</sup>	NSX250●MA <sup>(3)</sup>	220	2200	LC1F185	LR9F5371	132...220
110	195	<sup>(3)</sup>	–	–	–	–	–	–	NSX250●MA <sup>(3)</sup>	220	2640	LC1F225	LR9F5371	132...220
–	–	–	110	178	<sup>(3)</sup>	–	–	–	NSX250●MA <sup>(3)</sup>	220	2420	LC1F225	LR9F5371	132...220
–	–	–	–	–	–	132	184	<sup>(3)</sup>	NSX250●MA <sup>(3)</sup>	220	2640	LC1F265	LR9F5371	132...220
–	–	–	132	215	<sup>(3)</sup>	–	–	–	NSX250●MA <sup>(3)</sup>	220	2860	LC1F265	LR9F5371	132...220
132	230	<sup>(3)</sup>	–	–	–	–	–	–	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	3200	LC1F265	LR9F7375	200...330
–	–	–	–	–	–	160	224	<sup>(3)</sup>	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	2860	LC1F265	LR9F7375	200...330
–	–	–	160	256	<sup>(3)</sup>	–	–	–	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	3520	LC1F330	LR9F7375	200...330
160	280	<sup>(3)</sup>	200	321	<sup>(3)</sup>	–	–	–	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	4160	LC1F330	LR9F7375	200...330
–	–	–	–	–	–	200	280	<sup>(3)</sup>	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	3840	LC1F330	LR9F7375	200...330
–	–	–	–	–	–	220	310	<sup>(3)</sup>	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	4160	LC1F400	LR9F7379	300...500
200	350	<sup>(3)</sup>	220	353	<sup>(3)</sup>	–	–	–	NSX400● + Micrologic 1.3M <sup>(3)</sup>	500	5000	LC1F400	LR9F7379	300...500
–	–	–	250	401	<sup>(3)</sup>	–	–	–	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	5550	LC1F400	LR9F7379	300...500
–	–	–	–	–	–	250	344	<sup>(3)</sup>	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	5000	LC1F400	LR9F7379	300...500
220	388	<sup>(3)</sup>	–	–	–	–	–	–	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	5500	LC1F400	LR9F7379	300...500
250	430	<sup>(3)</sup>	280	470	<sup>(3)</sup>	315	432	<sup>(3)</sup>	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	6000	LC1F500	LR9F7379	300...500
–	–	–	–	–	–	355	488	<sup>(3)</sup>	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	6500	LC1F500	LR9F7381	380...630

<sup>(1)</sup> I<sub>rm</sub>: setting current of the magnetic trip.<sup>(2)</sup> For reversing operation, replace the prefix LC1 with LC2.<sup>(3)</sup> Reference to be completed by replacing the ● with the breaking performance code:

Breaking performance I <sub>q</sub> (kA)	NSX100●MA	NSX160●MA and NSX250●MA	NSX400● and NSX630●
400/415 V	36	70	70
440 V	35	65	65
500 V	25	50	50
660/690 V	8	10	20
Code	F	H	L



0.06 to 250 kW at 400/415 V: type 2 coordination														
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Circuit breaker			Contactor	Thermal overload relay	
400/415 V			440 V			500 V			Reference	Rating	I <sub>rm</sub> <sup>(1)</sup>	Reference <sup>(2)</sup>	Reference	Setting range
P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>		A	A			A
kW	A	kA	kW	A	kA	kW	A	kA						
0.06	0.2	130	0.06	0.19	130	–	–	–	GV2L03 or LE03	0.4	5	LC1D09	LRD02	0.16...0.25
0.09	0.3	130	0.09	0.28	130	–	–	–	GV2L03 or LE03	0.4	5	LC1D09	LRD03	0.25...0.40
–	–	–	0.12	0.37	130	–	–	–						
0.12	0.44	130	–	–	–	–	–	–	GV2L04 or LE04	0.63	8	LC1D09	LRD04	0.4...0.63
0.18	0.6	130	0.18	0.55	130	–	–	–						
0.25	0.85	130	0.25	0.76	130	–	–	–	GV2L05 or LE05	1	13	LC1D09	LRD05	0.63...1
0.37	1.1	130	0.37	0.99	130	–	–	–						
–	–	–	–	–	–	0.37	0.88	130	GV2L05 or LE05	1	13	LC1D09	LRD06	1...1.7
0.55	1.5	130	–	–	–	0.55	1.2	130	GV2L06 or LE06	1.6	22.5	LC1D09	LRD06	1...1.7
–	–	–	0.55	1.36	130	0.75	1.5	130						
0.75	1.9	130	0.75	1.68	130	1.1	2.2	130	GV2L07 or LE07	2.5	33.5	LC1D09	LRD07	1.6...2.5
1.1	2.7	130	1.1	2.37	130	1.5	2.9	130	GV2L08 or LE08	4	51	LC1D09	LRD08	2.5...4
1.5	3.6	130	–	–	–	2.2	3.9	130						
–	–	–	1.5	3.06	130	–	–	–	GV2L08 or LE08	4	51	LC1D09	LRD10	4...6
2.2	4.9	130	–	–	–	–	–	–	GV2L10 or LE10	6.3	78	LC1D09	LRD10	4...6
–	–	–	–	–	–	3	5.2	13						
–	–	–	2.2	4.42	50	–	–	–	GV2LE10	6.3	78	LC1D09	LRD10	4...6
–	–	–	3	5.77	50	3	5.2	50						
–	–	–	2.2	4.42	130	–	–	–	GV2L10	6.3	78	LC1D09	LRD10	4...6
–	–	–	3	5.77	130	3	5.2	130						
3	6.5	130	–	–	–	–	–	–	GV2L14 or LE14	10	10	LC1D09	LRD12	5.5...8
–	–	–	–	–	–	4	6.8	10	GV2LE14	10	138	LC1D12	LRD12	5.5...8
–	–	–	–	–	–	4	6.8	50	GV2L14	10	138	LC1D12	LRD12	5.5...8
4	8.5	130	–	–	–	–	–	–	GV2L14 or LE14	10	138	LC1D09	LRD14	7...10
–	–	–	4	7.9	15	–	–	–	GV2LE14	10	138	LC1D09	LRD14	7...10
–	–	–	4	7.9	130	–	–	–	GV2L14	10	138	LC1D09	LRD14	7...10
–	–	–	–	–	–	5.5	9.2	10	GV2LE14	10	138	LC1D09	LRD14	7...10
–	–	–	–	–	–	5.5	9.2	50	GV2L14	10	138	LC1D09	LRD14	7...10
5.5	11.5	130	5.5	10.4	50	7.5	12.4	42	GV2L16	14	170	LC1D25	LRD16	9...13
–	–	–	7.5	13.7	50	–	–	–	GV2L16	14	170	LC1D25	LRD21	12...18
7.5	15.5	50	9	16.9	20	9	13.9	10	GV2L20	18	223	LC1D25	LRD21	12...18
9	18.1	50	–	–	–	–	–	–	GV2L22	25	327	LC1D25	LRD22	16...24
11	22	50	11	20.1	20	–	–	–						
–	–	–	–	–	–	11	17.6	10	GV2L22	25	327	LC1D32	LRD22	16...24
–	–	–	–	–	–	15	23	10						
15	29	50	15	26.5	50	–	–	–	GV3L32	32	448	LC1D40A	LRD332	23...32
–	–	–	–	–	–	18.5	28	10	GV3L32	32	448	LC1D65A	LRD332	23...32

(1) I<sub>rm</sub>: setting current of the magnetic trip.

(2) For reversing operation, replace the prefix LC1 with LC2.



## 0.06 to 250 kW at 400/415 V: type 2 coordination

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Circuit breaker			Contactor	Thermal overload relay	
400/415 V			440 V			500 V			Reference	Rating	I <sub>rm</sub> <sup>(1)</sup>	Reference <sup>(2)</sup>	Reference	Setting range
P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>		A	A			A
kW	A	kA	kW	A	kA	kW	A	kA						
18.5	35	50	—	—	—	—	—	—	GV3L40	40	560	LC1D50A	LRD340	30...40
—	—	—	18.5	32.5	50	—	—	—	GV3L40	40	560	LC1D65A	LRD340	30...40
22	41	50	—	—	—	—	—	—	GV3L50	50	700	LC1D50A	LRD350	37...50
—	—	—	22	39	50	30	44	10	GV3L50	50	700	LC1D65A	LRD350	37...50
30	55	50	30	51.5	50	37	53	10	GV3L65	65	910	LC1D65A	LRD365	48...65
37	66	50	—	—	—	—	—	—	GV3L73	73	1120	LC1D80A	LRD380	62...80
45	60	50	—	—	—	—	—	—	GV3L80	80	1120	LC1D95	LRD3363	63...80
—	—	—	37	64	70	—	—	—	GV4L80	80	880	LC1D65A	LRD365	48...65
37	66	100	45	76	70	(4)	(4)	(4)	GV4L80	80	1040	LC1D80	LRD3363	63...80
45	80	100	55	90	70	(4)	(4)	(4)	GV4L115	115	1380	LC1D115 LC1F115	LR9D5367 LR9F5367	60...100 60...100
55	97	100	—	—	—	(4)	(4)	(4)	GV4L115	115	1495	LC1D115 LC1F115	LR9D5369 LR9F5369	90...150 90...150
—	—	—	—	—	—	55	78	(3)	NSX100●MA <sup>(3)</sup>	100	1040	LC1D80	LRD3363	63...80
45	80	(3)	55	90	(3)	—	—	—	NSX100●MA <sup>(3)</sup>	100	1300	LC1D115	LR9D5367	60...100
55	97	(3)	—	—	—	—	—	—	NSX160●MA <sup>(3)</sup>	150	1500	LC1D115	LR9D5369	90...150
—	—	—	—	—	—	75	106	(3)	NSX160●MA <sup>(3)</sup>	150	1950	LC1D115	LR9D5369	90...150
75	132	(3)	75	125	(3)	—	—	—	NSX160●MA <sup>(3)</sup>	150	1950	LC1D150	LR9D5369	90...150
—	—	—	90	146	(3)	—	—	—	NSX160●MA <sup>(3)</sup>	150	1950	LC1D150	LR9D5369	90...150
—	—	—	—	—	—	90	128	(3)	NSX160●MA <sup>(3)</sup>	150	1200	LC1D150	LR9D5369	90...150
90	160	(3)	110	178	(3)	—	—	—	NSX250●MA <sup>(3)</sup>	220	2420	LC1F185	LR9F5371	132...220
—	—	—	—	—	—	110	156	(3)	NSX250●MA <sup>(3)</sup>	220	1540	LC1F185	LR9F5371	132...220
110	195	(3)	—	—	—	—	—	—	NSX250●MA <sup>(3)</sup>	220	2860	LC1F225	LR9F5371	132...220
—	—	—	132	215	(3)	132	184	(3)	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	3500	LC1F265	LR9F5371	132...220
132	230	(3)	160	256	(3)	—	—	—	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	3520	LC1F265	LR9F7375	200...330
—	—	—	—	—	—	160	224	(3)	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	2200	LC1F265	LR9F7375	200...330
160	280	(3)	—	—	—	—	—	—	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	4000	LC1F330	LR9F7375	200...330
—	—	—	200	321	(3)	—	—	—	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	4000	LC1F330	LR9F7379	300...500
—	—	—	—	—	—	200	280	(3)	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	3500	LC1F400	LR9F7375	200...330
—	—	—	—	—	—	220	310	(3)	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	3500	LC1F400	LR9F7379	300...500
—	—	—	220	353	(3)	—	—	—	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	5500	LC1F400	LR9F7379	300...500
200	350	(3)	250	401	(3)	—	—	—	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	4500	LC1F500	LR9F7379	300...500
—	—	—	—	—	—	250	344	(3)	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	4500	LC1F500	LR9F7379	300...500
220	388	(3)	—	—	—	—	—	—	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	6250	LC1F500	LR9F7379	300...500
250	430	(3)	—	—	—	—	—	—	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	6250	LC1F500	LR9F7379	300...500
—	—	—	—	—	—	355	488	(3)	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	5000	LC1F630	LR9F7381	380...630

(1) I<sub>rm</sub>: setting current of the magnetic trip.

(2) For reversing operation, replace the prefix LC1 with LC2.

(3) Reference to be completed by replacing the ● with the breaking performance code:

Breaking performance I <sub>q</sub> (kA)	NSX100●MA	NSX160●MA and NSX250●MA	NSX400● and NSX630●
400/415 V	36	70	70
440 V	35	65	65
500 V	25	50	50
660/690 V	8	10	20
Code	F	H	L

(4) Please consult your regional sales office.



0.06 to 30 kW at 400/415 V: type 2 coordination												
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Circuit breaker			Contactor		Electronic thermal overload relay	
400/415 V			690 V			Reference	Rating	I <sub>rm</sub>	Reference	Reference	Setting range	
P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>		A	A			A	
kW	A	kA	kW	A	kA							
0.06	0.2	100	–	–	–	GV2L03	0.4	5	LC1D09	LR9D01	0.1...0.5	
0.09	0.3	100	–	–	–	GV2L03	0.4	5	LC1D09	LR9D01	0.1...0.5	
0.12	0.44	100	–	–	–	GV2L04	0.63	8	LC1D18	LR9D02	0.4...2.0	
0.18	0.6	100	–	–	–	GV2L04	0.63	8	LC1D18	LR9D02	0.4...2.0	
0.25	0.85	100	–	–	–	GV2L05	1	13	LC1D18	LR9D02	0.4...2.0	
0.37	1.1	100	–	–	–	GV2L05	1	13	LC1D18	LR9D02	0.4...2.0	
0.55	1.5	100	–	–	–	GV2L06	1.6	22.5	LC1D18	LR9D02	0.4...2.0	
0.75	1.9	100	–	–	–	GV2L07	2.5	33.5	LC1D18	LR9D08	1.6...8.0	
1.1	2.7	100	–	–	–	GV2L08	4	51	LC1D18	LR9D08	1.6...8.0	
1.5	3.6	100	–	–	–	GV2L08	4	51	LC1D18	LR9D08	1.6...8.0	
2.2	4.9	100	–	–	–	GV2L10	6.3	78	LC1D18	LR9D08	1.6...8.0	
3	6.5	100	–	–	–	GV2L14	10	138	LC1D25	LR9D32	6.4...32	
4	8.5	100	–	–	–	GV2L14	10	138	LC1D25	LR9D32	6.4...32	
5.5	11.5	100	–	–	–	GV2L16	14	170	LC1D25	LR9D32	6.4...32	
7.5	15.5	50	–	–	–	GV2L20	18	223	LC1D25	LR9D32	6.4...32	
11	22	50	–	–	–	GV2L22	25	327	LC1D25	LR9D32	6.4...32	
15	29	50	–	–	–	GV3L32	40	448	LC1D65A	LR9D110S	22...110	
18.5	35	50	–	–	–	GV3L40	40	560	LC1D65A	LR9D110S	22...110	
22	41	50	–	–	–	GV3L50	50	700	LC1D65A	LR9D110S	22...110	
30	55	50	–	–	–	GV3L65	65	910	LC1D65A	LR9D110S	22...110	
–	–	–	0.37	0.64	50	GV2L05	1	13	LC1D09	LR9D02	0.4...2.0	
–	–	–	0.55	0.87	50	GV2L05	1	13	LC1D09	LR9D02	0.4...2.0	
–	–	–	0.75	1.1	50	GV2L06	1.6	22.5	LC1D09	LR9D02	0.4...2.0	
–	–	–	1.1	1.6	50	GV2L07 + LA9LB920	2.5	33.5	LC1D25	LR9D08	1.6...8.0	
–	–	–	1.5	2.1	50	GV2L07 + LA9LB920	2.5	33.5	LC1D25	LR9D08	1.6...8.0	
–	–	–	2.2	2.8	50	GV2L08 + LA9LB920	4	51	LC1D25	LR9D08	1.6...8.0	
–	–	–	3	4	50	GV2L08 + LA9LB920	4	51	LC1D25	LR9D08	1.6...8.0	
–	–	–	4	5	50	GV2L10 + LA9LB920	6.3	78	LC1D25	LR9D08	1.6...8.0	
–	–	–	5.5	7	50	GV2L14 + LA9LB920	10	138	LC1D25	LR9D32	6.4...32	
–	–	–	7.5	8.9	50	GV2L14 + LA9LB920	10	138	LC1D25	LR9D32	6.4...32	
–	–	–	11	13	3	GV3L18+ LA9LB920	14	252	LC1D32	LR9D32	6.4...32	
–	–	–	15	16.5	3	GV2L22 + LA9LB920	18	327	LC1D32	LR9D32	6.4...32	
–	–	–	18.5	21	3	GV3L25 + LA9LB920	25	350	LC1D65A	LR9D32	6.4...32	
–	–	–	22	25	3	GV2L32 + LA9LB920	32	416	LC1D65A	LR9D32	6.4...32	



## 1.5 to 315 kW at 400/415 V: type 1 coordination

Maximum operating rate: LC3K and LC3F: 12 starts/hour; LC3D: 30 starts/hour.

Maximum starting time: LC3K and LC3D: 30 seconds; LC3F: 20 seconds.

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3								Fuse carrier (basic block)	aM fuses		Star-delta contactors	Thermal overload relay	
400/415 V				440 V				Reference	Size	Rating	Reference	Reference	Setting range
P kW	I <sub>e</sub> A	I <sub>rD</sub> <sup>(1)</sup> A	I <sub>q</sub> kA	P kW	I <sub>e</sub> A	I <sub>rD</sub> <sup>(1)</sup> A	I <sub>q</sub> kA			A			A
1.5	3.5	2	50	1.5	3.06	2	50	LS1D32	10 x 38	4	LC3K06	LR2K0308	1.8...2.6
2.2	5	3	50	—	—	—	—	LS1D32	10 x 38	6	LC3K06	LR2K0310	2.6...3.7
—	—	—	—	2.2	4.42	3	50	—	—	—	—	—	—
—	—	—	—	3	5.77	3	50	LS1D32	10 x 38	8	LC3K06	LR2K0310	2.6...3.7
3	6.5	4	50	—	—	—	—	LS1D32	10 x 38	8	LC3K06	LR2K0312	3.7...5.5
4	8.4	5	50	4	7.9	5	50	LS1D32	10 x 38	12	LC3K06	LR2K0312	3.7...5.5
5.5	11	6	50	5.5	10.4	6	50	LS1D32	10 x 38	16	LC3K06	LR2K0314	5.5...8
7.5	14.8	9	50	7.5	13.7	8	50	LS1D32	10 x 38	16	LC3K09	LR2K0316	8...11.5
9	18.1	10	100	9	16.9	10	50	LS1D32	10 x 38	20	LC3D12A	LRD16	9...13
11	21	12	100	11	20.1	12	100	GK1EK	14 x 51	25	LC3D12A	LRD16	9...13
15	28.5	16	100	15	26.5	15	100	GK1EK	14 x 51	32	LC3D18A	LRD21	12...18
18.5	35	20	100	18.5	32.8	19	100	GK1EK	14 x 51	40	LC3D18A	LRD22	16...24
—	—	—	—	22	39	23	100	GS●J	22 x 58	50	LC3D18A	LRD22	16...24
22	42	24	100	—	—	—	—	GS●J	22 x 58	50	LC3D32A	LRD32	23...32
—	—	—	—	30	51.5	30	100	GS●J	22 x 58	63	LC3D32A	LRD32	23...32
30	57	33	100	37	64	37	100	GS●J	22 x 58	80	3 x LC1D40A	LRD340	30...40
37	69	40	100	—	—	—	—	GS●J	22 x 58	80	3 x LC1D40A	LRD350	37...50
—	—	—	—	45	76	44	100	GS●J	22 x 58	80	3 x LC1D50A	LRD350	37...50
45	81	47	100	—	—	—	—	GS●J	22 x 58	100	3 x LC1D50A	LRD350	37...50
—	—	—	—	55	90	52	100	GS●K	22 x 58	100	3 x LC1D50A	LRD365	48...65
55	100	58	100	—	—	—	—	GS●K	22 x 58	125	3 x LC1D65A	LRD365	48...65
75	135	78	100	75	125	72	100	GS●L	T0	160	LC3D80	LRD3363	63...80
—	—	—	—	90	146	84	100	GS●L	T0	160	LC3D115	LRD4365	80...104
90	165	95	100	—	—	—	—	GS●N	T1	200	LC3D115	LRD4367	95...120
110	200	115	100	110	178	103	100	GS●N	T1	200	LC3D115	LRD4367	95...120
132	240	139	100	132	215	124	100	GS●QQ	T2	250	LC3D150	LRD4369	110...140
160	285	165	100	160	256	148	100	GS●QQ	T2	315	LC3F185	LR9F5371	132...220
—	—	—	—	200	321	185	100	GS●QQ	T2	400	LC3F225	LR9F5369	132...220
220	388	225	100	—	—	—	—	GS●QQ	T2	400	LC3F265	LR9F7375	200...330
—	—	—	—	250	401	233	100	GS2S	T3	500	LC3F265	LR9F7375	200...330
280	480	278	100	—	—	—	—	GS2S	T3	500	LC3F330	LR9F7375	200...330
—	—	—	—	315	505	293	100	—	—	—	—	—	—
315	555	322	100	355	518	300	100	GS2S	T3	630	LC3F330	LR9F7375	200...330
—	—	—	—	375	575	334	100	GS2S	T3	630	LC3F400	LR9F7379	300...500

(1) I<sub>rD</sub>: current in the motor windings in delta connection.



## 1.5 to 355 kW at 400/415 V: type 2 coordination

Maximum operating rate: LC1D: 30 starts/hour; LC1F: 12 starts/hour.

Maximum starting time: LC1D: 30 seconds; LC1F: 20 seconds.

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Switch-disconnector-fuse	aM fuses		Star-delta contactors	Thermal overload relay	
400/415 V			440 V			Reference	Size	Rating	Reference	Reference	Setting range
P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>						
kW	A	kA	kW	A	kA			A			A
1.5	3.5	50	1.5	3.06	50	GS1DD	10 x 38	4	3 x LC1D09	LRD08	2.5...4
2.2	5	50	2.2	4.42	50	GS1DD	10 x 38	6	3 x LC1D09	LRD10	4...6
3	6.5	50	3	5.77	50	GS1DD	10 x 38	8	3 x LC1D09	LRD12	5.5...8
4	8.4	50	4	7.9	50	GS1DD	10 x 38	10	3 x LC1D09	LRD14	7...10
5.5	11	50	5.5	10.4	50	GS1DD	10 x 38	16	3 x LC1D12	LRD16	9...13
7.5	14.8	50	7.5	13.7	50	GS1DD	10 x 38	16	3 x LC1D18	LRD21	12...18
9	18.1	100	9	16.9	100	GS●F	14 x 51	25	3 x LC1D25	LRD22	16...24
11	21	100	11	20.1	100						
15	28.5	100	15	26.5	100	GS●F	14 x 51	32	3 x LC1D32	LRD32	23...32
18.5	35	100	18.5	32.8	100	GS●F	14 x 51	40	3 x LC1D40A	LRD340	30...40
22	42	100	22	39	100	GS●J	22 x 58	50	3 x LC1D50A	LRD350	37...50
30	57	100	30	51.5	100	GS●J	22 x 58	80	3 x LC1D65A	LRD365	48...65
37	69	100	37	64	100	GS●J	22 x 58	80	3 x LC1D80	LRD3363	63...80
–	–	–	45	76	100	GS●J	22 x 58	80	3 x LC1D80	LRD3365	80...93
45	81	100	–	–	–	GS●J	22 x 58	100	3 x LC1D115	LR9D5367	60...100
–	–	–	55	90	100	GS●L	T0	125	3 x LC1D115	LR9D5369	90...150
55	100	100	–	–	–	GS●L	T0	125	3 x LC1D150	LR9D5369	90...150
–	–	–	75	125	100	GS●L	T0	160	3 x LC1D150	LR9D5369	90...150
75	135	100	–	–	–	GS●L	T0	160	3 x LC1F185	LR9D5369	90...150
90	165	100	90	146	100	GS●N	T1	200	3 x LC1F185	LR9F5371	132...220
110	200	100	110	178	100	GS●N	T1	250	3 x LC1F225	LR9F5371	132...220
132	240	100	132	215	100	GS●QQ	T2	315	3 x LC1F265	LR9F7375	200...330
160	285	100	160	256	100	GS●QQ	T2	400	3 x LC1F330	LR9F7375	200...330
–	–	–	200	321	100	GS●QQ	T2	400	3 x LC1F330	LR9F7379	300...500
200	352	100	220	353	100	GS2S	T3	500	3 x LC1F400	LR9F7379	300...500
220	388	100	250	401	100						
250	437	100	–	–	–	GS2S	T3	500	3 x LC1F500	LR9F7379	300...500
315	555	100	315	505	100	GS2S	T3	630	3 x LC1F630	LR9F7381	380...630
–	–	–	355	549	100	GS2V	T4	800	3 x LC1F630	LR9F7381	380...630
–	–	–	400	611	100						
355	605	100	–	–	–	GS2V	T4	800	3 x LC1F780	LR9F7381	380...630



**1.5 to 375 kW at 415 V: type 2 coordination****Maximum operating rate:** LC1D: 30 starts/hour; LC1F: 12 starts/hour.**Maximum starting time:** LC1D: 30 seconds; LC1F: 20 seconds.

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Switch- disconnecter- fuse	BS fuses		Star-delta contactors	Thermal overload relay		
415 V			440 V				Reference	Size	Rating	Reference	Reference	Setting range
P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>							
kW	A	kA	kW	A	kA			A			A	
1.5	3.5	50	1.5	3.06	50	GS1DDB	A1	NIT 16	3 x LC1D09	LRD08	2.5...4	
2.2	5	50	2.2	4.42	50	GS1DDB	A1	NIT 16	3 x LC1D09	LRD10	4...6	
3	6.5	50	3	5.77	50	GS1DDB	A1	NIT 20	3 x LC1D09	LRD12	5.5...8	
4	8.4	50	4	7.9	50	GS1DDB	A1	NIT 20	3 x LC1D09	LRD14	7...10	
5.5	11	50	5.5	10.4	50	GS1DDB	A1	NIT 20M25	3 x LC1D12	LRD16	9...13	
7.5	14.8	50	7.5	13.7	50	GS1DDB	A1	NIT 20M32	3 x LC1D18	LRD21	12...18	
9	18.1	50	9	16.9	50	GS2GB	A2	TIA 32M35	3 x LC1D18	LRD21	12...18	
11	21	50	11	20.1	50	GS2GB	A2	TIA 32M50	3 x LC1D25	LRD22	16...24	
15	28.5	50	15	26.5	50	GS2GB	A2	TIA 32M63	3 x LC1D32	LRD32	23...32	
22	42	50	22	39	50	GS2GB	A3	TIS 63M80	3 x LC1D50A	LRD350	37...50	
–	–	–	30	51.5	50	GS2GB	A3	TIS 63M100	3 x LC1D65A	LRD365	48...65	
30	57	50	–	–	–	GS2GB	A3	TIS 63M100	3 x LC1D65A	LRD365	48...65	
45	81	50	45	76	50	GS2LLB	A4	TCP 100M125	3 x LC1D80	LRD3363	63...80	
55	100	80	55	90	80	GS2LLB	A4	TCP 100M160	3 x LC1D115	LR9D5369	90...150	
80	138	80	80	132	80	GS2LB	B2	TF 200M250	3 x LC1D150	LR9D5369	90...150	
100	182	80	100	162	80	GS2MMB	B2	TF 200M250	3 x LC1F185	LR9F5371	132...220	
110	196	80	110	178	80	GS2MMB	B2	TF 200M315	3 x LC1F225	LR9F5371	132...220	
140	250	80	140	226	80	GS2NB	B3	TFK 315M355	3 x LC1F265	LR9F7375	200...330	
160	285	80	160	256	80	GS2QQB	B3	TFK 315M355	3 x LC1F330	LR9F7375	200...330	
220	388	80	220	353	80	GS2QQB	B4	TMF 400M450	3 x LC1F400	LR9F7379	300...500	
257 270	450 460	80 80	257 270	412 433	80 80	GS2SB	C2	TTM 500	3 x LC1F500	LR9F7379	300...500	
375	610	80	375	577	80	GS2SB	C2	TTM 630	3 x LC1F630	LR9F7381	380...630	



## 1.5 to 110 kW at 400/415 V: type 1 coordination

Maximum operating rate: LC3K: 12 starts/hour; LC3D: 30 starts/hour.

Maximum starting time: 30 seconds.

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3								Circuit breaker	Star-delta contactors	
400/415 V				440 V				Reference <i>References in italics are available in CEE zone only</i>	Setting range of thermal trips	Reference
P	I <sub>e</sub>	I <sub>rD</sub> <sup>(1)</sup>	I <sub>q</sub> <sup>(2)</sup>	P	I <sub>e</sub>	I <sub>rD</sub> <sup>(1)</sup>	I <sub>q</sub> <sup>(2)</sup>			
kW	A	A	kA	kW	A	A	kA		A	
1.5	3.6	2	50	1.5	3.06	1.8	50	GV2ME08 <i>GV2ME08AP</i>	2.5...4	LC3K06
2.2	4.9	2.9	50	2.2	4.42	2.6	50	GV2ME10 <i>GV2ME10AP</i>	4...6.3	LC3K06
—	—	—	—	3	5.77	3.3	50			
3	6.5	3.8	50	—	—	—	—	GV2ME14 <i>GV2ME14AP</i>	6...10	LC3K06
4	8.5	4.9	50	4	7.9	4.6	15			
5.5	11.5	6.4	15	5.5	10.4	6	8	GV2ME16 <i>GV2ME16AP</i>	9...14	LC3K06
7.5	15.5	8.6	15	7.5	13.7	7.9	8	GV2ME20 <i>GV2ME20AP</i>	13...18	LC3K09
—	—	—	—	9	16.9	9.8	8	GV2ME20 <i>GV2ME20AP</i>	13...18	LC3D12A
9	18.1	10	15	11	20.1	12	6	GV2ME21 <i>GV2ME21AP</i>	17...23	LC3D12A
11	22	12	15	—	—	—	—	GV2ME22 <i>GV2ME22AP</i>	20...25	LC3D12A
15	29	17	10	15	26.5	15	6	GV2ME32 <i>GV2ME32AP</i>	24...32	LC3D18A
18.5	35	20	50	18.5	32.8	19	50	GV3P40	30...40	LC3D18A
—	—	—	—	22	39	23	50	GV3P50	37...50	LC3D32A
22	41	24	50	30	51.5	30	50	GV3P50	37...50	LC3D32A
30	55	33	50	30	51.5	30	50	GV3P65	48...65	LC3D32A
37	66	40	50	37	64	37	50	GV3P65	48...65	3 x LC1D40A <sup>(3)</sup>
37	66	40	100	37	64	37	70	GV4P80	40...80	3 x LC1D40A <sup>(3)</sup>
—	—	—	—	45	76	44	70	GV4P80	40...80	2 x LC1D50A +1 x LC1D40A <sup>(3)</sup>
45	80	47	100	—	—	—	—	GV4P115	65...115	2 x LC1D50A +1 x LC1D40A <sup>(3)</sup>
55	97	58	100	55	90	52	70	GV4P115	65...115	2 x LC1D65A +1 x LC1D40A <sup>(3)</sup>
75	132	78	35	75	125	72	35	GV5P150F	70...150	LC3D80
—	—	—	—	90	146	84	35	GV5P150F	0...150	LC3D115
90	160	95	35	110	178	103	35	GV5P220F	100...220	LC3D115
110	195	115	35							
—	—	—	—	132	215	124	35	GV5P220F	100...220	LC3D150
132	230	135	36	—	—	—	—	GV6P320F	160...320	LC3D150 or 3 x LC1F150
160	270	158	36	160	256	94	35	GV6P320F	160...320	3 x LC1F185
220	380	220	36	250	401	146	35	GV6P500F	250...500	3 x LC1F265
250	430	250	36	300	480	175	35	GV6P500F	250...500	3 x LC1F330

<sup>(1)</sup> I<sub>rD</sub>: current in the motor windings in delta connection.<sup>(2)</sup> The breaking performance of circuit breakers GV2ME can be increased by adding a current limiter GV1L3, see page B6/23.<sup>(3)</sup> For mounting 3 contactors LC1D●●A, star-delta starter kit LAD9SD3 must be ordered separately, see page B8/29.



## 1.5 to 250 kW at 400/415 V: type 2 coordination

Maximum operating rate: LC1D: 30 starts/hour; LC1F: 12 starts/hour.

Maximum starting time: LC1D: 30 seconds; LC1F: 20 seconds.

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3								Circuit breaker		Star-delta contactors
400/415 V				440 V				Reference	Setting range of thermal trips	Reference
P	I <sub>e</sub>	I <sub>rD</sub> <sup>(8)</sup>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>rD</sub> <sup>(8)</sup>	I <sub>q</sub> <sup>(1)</sup>		A	
kW	A	A	kA	kW	A	A	kA			
1.5	3.6	–	130	1.5	3.06	–	130	GV2P08	2.5...4	3 x LC1D09 <sup>(2)</sup>
2.2	4.9	–	130	2.2	4.42	–	130	GV2P10	4...6.3	3 x LC1D18 <sup>(3)</sup>
–	–	–	–	3	5.77	–	130	GV2P10	4...6.3	3 x LC1D18 <sup>(3)</sup>
3	6.5	–	130	–	–	–	–	GV2P14	6...10	3 x LC1D18 <sup>(3)</sup>
4	8.5	–	130	4	7.9	–	130	GV2P14	6...10	3 x LC1D18 <sup>(3)</sup>
5.5	11.5	–	130	5.5	10.4	–	50	GV2P16	9...14	3 x LC1D25 <sup>(3)</sup>
–	–	–	–	7.5	13.7	–	50	GV2P16	9...14	3 x LC1D25 <sup>(3)</sup>
7.5	15.5	–	50	9	16.9	–	20	GV2P20	13...18	3 x LC1D25 <sup>(3)</sup>
9	18.1	–	50	11	20.1	–	20	GV2P21	17...23	3 x LC1D25 <sup>(3)</sup>
11	22	–	50	–	–	–	–	GV2P22	20...25	3 x LC1D25 <sup>(3)</sup>
15	29	–	50	15	26.5	–	50	GV3P32	23...32	3 x LC1D40A <sup>(4)</sup>
18.5	35	–	50	–	–	–	–	GV3P40	30...40	2 x LC1D50A +1 x LC1D40A <sup>(3)</sup>
–	–	–	–	18.5	32.8	–	50	GV3P40	30...40	2 x LC1D65A +1 x LC1D40A <sup>(4)</sup>
22	41	–	50	–	–	–	–	GV3P50	37...50	2 x LC1D50A +1 x LC1D40A <sup>(3)</sup>
–	–	–	–	22	39	–	50	GV3P50	37...50	2 x LC1D65A +1 x LC1D40A <sup>(4)</sup>
30	55	–	50	30	51.5	–	50	GV3P65	48...65	2 x LC1D65A +1 x LC1D40A <sup>(4)</sup>
37	66	–	100	45	76	–	70	GV4P80	40...80	3 x LC1D80 <sup>(5)</sup>
–	–	–	–	37	64	–	70	GV4P80	40...80	3 x LC1D65A <sup>(4)</sup>
45	80	–	100	–	–	–	–	GV4P115	65...115	3 x LC1D115 <sup>(6)</sup>
55	97	–	100	55	90	–	70	GV4P115	65...115	3 x LC1D115 <sup>(6)</sup>
75	132	78	70	75	125	74	65	GV5P150H	70...150	3 x LC1D150 <sup>(6)</sup>
–	–	–	–	90	146	86	65	GV5P150H	70...150	3 x LC1D150 <sup>(6)</sup>
90	160	95	70	110	178	104	65	GV5P220H	100...220	3 x LC1F185 <sup>(7)</sup>
110	195	115	70	132	215	126	65	GV5P220H	100...220	3 x LC1F225 <sup>(7)</sup>
132	230	135	70	–	–	–	–	GV6P320H	160...320	3 x LC1F265
160	270	156	70	160	256	150	65	GV6P320H	160...320	3 x LC1F265
220	380	220	70	250	401	234	65	GV6P500H	250...500	3 x LC1F500
250	430	250	70	300	480	279	65	GV6P500H	250...500	3 x LC1F500

<sup>(1)</sup> The breaking performance of circuit breakers GV2P can be increased by adding a current limiter GV1L3, see page B6/54.<sup>(2)</sup> For mounting 3 contactors LC1D09, star-delta starter kit LAD91217 must be ordered separately, see page B8/29.<sup>(3)</sup> For mounting 3 contactors LC1D18 or LC1D25, star-delta starter kit LAD93217 must be ordered separately, see page B8/29.<sup>(4)</sup> For mounting 3 contactors LC1D65A, star-delta starter kit LAD9SD3 must be ordered separately, see page B8/29.<sup>(5)</sup> For mounting 3 contactors LC1D80, star-delta starter kit LA9D8017 must be ordered separately, see page B8/29.<sup>(6)</sup> For mounting 3 contactors LC1D115 or LC1D150, see A2/13.<sup>(7)</sup> For mounting 3 contactors LC1F185 or LC1F225, see pages A2/15 and A2/17.<sup>(8)</sup> I<sub>rD</sub>: current in the motor windings in delta connection.



## Coordination: Star-delta with Magnetic circuit breaker + Contactors + Thermal overload relay

### 1.5 to 315 kW at 400/415 V: type 1 coordination

**Maximum operating rate:** LC3K and LC3F: 12 starts/hour; LC3D: 30 starts/hour.

**Maximum starting time:** LC3K and LC3D: 30 seconds; LC3F: 20 seconds.

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3								Circuit breaker			Star-delta contactors	Thermal overload relay	
400/415 V				440 V				Reference	Rating	I <sub>rm</sub> <sup>(2)</sup>	Reference	Reference	Setting range
P	I <sub>e</sub>	I <sub>rD</sub> <sup>(1)</sup>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>rD</sub> <sup>(1)</sup>	I <sub>q</sub>		A	A			A
—	—	—	—	1.5	3.06	1.8	50	LC3D32A	4	51	LC3K06	LR2K0308	1.8...2.6
1.5	3.6	2	50	2.2	4.42	3	50						
2.2	4.9	3	50	3	5.77	3	50	GV2LE10	6.3	78	LC3K06	LR2K0310	2.6...3.7
3	6.5	4	50	—	—	—	—	GV2LE14	10	138	LC3K06	LR2K0312	3.7...5.5
—	—	—	—	4	7.9	5	50	GV2LE10	6.3	78	LC3K06	LR2K0312	3.7...5.5
4	8.5	5	50	—	—	—	—	GV2LE14	10	138	LC3K06	LR2K0312	3.7...5.5
—	—	—	—	5.5	10.4	6	15	GV2LE14	10	138	LC3K06	LR2K0314	5.5...8
5.5	11.5	6	15	—	—	—	—	GV2LE16	14	170	LC3K06	LR2K0314	5.5...8
—	—	—	—	7.5	13.7	8	8	GV2LE16	14	170	LC3K09	LR2K0316	8...11.5
7.5	15.5	9	15	—	—	—	—	GV2LE20	18	223	LC3K09	LR2K0316	8...11.5
—	—	—	—	9	16.9	1	8	GV2LE16	14	170	LC3D12A	LRD16	9...13
9	18.1	10	15	—	—	—	—	GV2LE22	25	327	LC3K12	LR2K0316	8...11.5
—	—	—	—	11	20.1	12	8	GV2LE20	18	223	LC3K12	LR2K0321	10...14
11	22	12	15	—	—	—	—	GV2LE22	25	327	LC3K12	LR2K0321	10...14
—	—	—	—	15	26.5	15	6	GV2LE22	25	327	LC3D18A	LRD21	12...18
15	29	16	10	—	—	—	—	GV2LE32	32	384	LC3D18A	LRD21	12...18
18.5	35	20	50	18.5	32.8	19	50	GV3L40	40	560	LC3D18A	LRD22	16...24
22	41	24	50	22	39	23	50	GV3L50	50	700	LC3D32A	LRD32	23...32
—	—	—	—	30	51.5	30	50	GV3L65	65	910	LC3D32A	LRD32	23...32
30	55	33	50	—	—	—	—	GV3L65	65	910	LC3D32A	LRD35	30...38
—	—	—	—	37	64	37	50	GV3L65	65	910	3 x LC1D40A <sup>(4)</sup>	LRD340	30...40
37	66	40	100	—	—	—	—	GV4L80	80	640	3 x LC1D40A <sup>(4)</sup>	LRD350	37...50
—	—	—	—	37	64	37	70	GV4L80	80	640	3 x LC1D40A <sup>(4)</sup>	LRD340	30...40
—	—	—	—	45	76	44	70	GV4L80	80	800	2 x LC1D50A + 1 x LC1D40A <sup>(4)</sup>	LRD350	30...40
45	80	47	100	—	—	—	—	GV4L115	115	805	2 x LC1D50A + 1 x LC1D40A <sup>(4)</sup>	LRD350	30...40
55	97	58	100	55	90	52	70	GV4L115	115	805	2 x LC1D50A + 1 x LC1D40A <sup>(4)</sup>	LRD350	30...40
—	—	—	—	75	125	72	<sup>(3)</sup>	NSX160●MA <sup>(3)</sup>	150	1200	LC3D80	LRD3363	63...80
75	132	78	<sup>(3)</sup>	—	—	—	—	NSX160●MA <sup>(3)</sup>	150	1200	LC3D80	LRD3363	63...80
—	—	—	—	90	146	85	<sup>(3)</sup>	NSX160●MA <sup>(3)</sup>	150	1200	LC3D115	LRD4365	80...104
90	160	96	<sup>(3)</sup>	110	178	103	<sup>(3)</sup>	NSX250●MA <sup>(3)</sup>	220	1760	LC3D115	LRD4365	80...104
—	—	—	—	132	215	125	<sup>(3)</sup>	NSX250●MA <sup>(3)</sup>	220	1760	LC3D150	LRD4369	110...140
110	195	116	<sup>(3)</sup>	—	—	—	—	NSX250●MA <sup>(3)</sup>	220	1760	LC3D115	LRD4367	95...120
—	—	—	—	160	256	148	<sup>(3)</sup>	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	2240	LC3D150	LR9D5369	90...150
—	—	—	—	200	321	186	<sup>(3)</sup>	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	3150	LC3F225	LR9F5371	132...220
132	230	139	<sup>(3)</sup>	—	—	—	—	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	2240	LC3D150	LRD4369	110...140
160	280	165	<sup>(3)</sup>	—	—	—	—	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	2560	LC3F185	LR9F5371	132...220
200	350	204	<sup>(3)</sup>	220	353	204	<sup>(3)</sup>	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	3150	LC3F225	LR9F5371	132...220
220	388	225	<sup>(3)</sup>	250	401	233	<sup>(3)</sup>	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	3500	LC3F265	LR9F7375	200...330
280	480	278	<sup>(3)</sup>	—	—	—	—	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	4000	LC3F330	LR9F7375	200...330
—	—	—	—	315	505	295	<sup>(3)</sup>	NSX800● + Micrologic 5.0 - LR off	800	4000	LC3F330	LR9F7375	200...330
315	540	322	<sup>(3)</sup>	355	518	300	<sup>(3)</sup>	NSX800● + Micrologic 5.0 - LR off	800	4500	LC3F330	LR9F7375	200...330
—	—	—	—	375	575	334	<sup>(3)</sup>	NSX800● + Micrologic 5.0 - LR off	800	5000	LC3F400	LR9F7379	300...500

<sup>(1)</sup> I<sub>rD</sub>: current in the motor windings in delta connection.

<sup>(2)</sup> I<sub>rm</sub>: setting current of the magnetic trip.

<sup>(3)</sup> Products marketed under the Merlin Gerin brand. Reference to be completed by replacing the ● with the breaking performance code:

Breaking performance I <sub>q</sub> (kA)	NSX100●MA		NSX160●MA, NSX250●MA		NSX400●, NSX630●		NS800●	
400/415 V	36	70	36	70	70	150	70	150
440 V	35	65	35	65	65	130	65	130
Code	F	H	F	H	H	L	H	L

<sup>(4)</sup> For mounting 3 contactors LC1D●●A, star-delta starter kit LAD9SD3 must be ordered separately, see page B8/29.



## Coordination: Star-delta with Magnetic circuit breaker + Contactors + Thermal overload relay

### 1.5 to 250 kW at 400/415 V: type 2 coordination

**Maximum operating rate:** LC3D: 30 starts/hour; LC3F: 12 starts/hour.

**Maximum starting time:** LC3D: 30 seconds; LC3F: 20 seconds.

**Standard power ratings of 3-phase motors**  
50/60 Hz in category AC-3

						Circuit breaker			Star-delta contactors Reference	Thermal overload relay	
400/415 V			440 V			Reference	Rating	I <sub>rm</sub> <sup>(1)</sup>		Reference	Setting range
P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>		A	A			A
kW	A	kA	kW	A	kA						
1.5	3.6	130	1.5	3.06	130	GV2L08	4	51	3 x LC1D09	LRD08	2.5...4
2.2	4.9	130	2.2	4.42	130	GV2L10	6.3	78	3 x LC1D09	LRD10	4...6
3	6.5	130	3	5.77	130						
—	—	—	4	7.9	20	GV2L14	10	138	3 x LC1D18	LRD14	7...10
4	8.5	130	—	—	—	GV2L14	10	138	3 x LC1D18	LRD16	9...13
5.5	11.5	50	5.5	10.4	20	GV2L16	14	170	3 x LC1D25	LRD16	9...13
7.5	15.5	50	7.5	13.7	20	GV2L20	18	223	3 x LC1D25	LRD21	12...18
—	—	—	9	16.9	20	GV2L22	25	327	3 x LC1D25	LRD21	12...18
9	18.1	50	—	—	—	GV2L22	25	327	3 x LC1D25	LRD22	16...24
11	22	50	11	20.1	20						
15	29	50	15	26.5	50	GV3L32	32	448	3 x LC1D40A <sup>(2)</sup>	LRD332	23...32
18.5	35	50	—	—	—	GV3L40	40	560	2 x LC1D50A +1 x LC1D40A <sup>(2)</sup>	LRD340	30...40
—	—	—	18.5	32.8	50	GV3L40	40	560	2 x LC1D65A +1 x LC1D40A <sup>(2)</sup>	LRD340	30...40
22	41	50	—	—	—	GV3L50	50	700	2 x LC1D50A +1 x LC1D40A <sup>(2)</sup>	LRD350	37...50
—	—	—	22	39	50	GV3L50	50	700	2 x LC1D65A +1 x LC1D40A <sup>(2)</sup>	LRD350	37...50
30	55	50	30	51.5	50	GV3L65	65	910	2 x LC1D65A +1 x LC1D40A <sup>(2)</sup>	LRD365	48...65
—	—	—	37	64	50	GV3L65	65	910	3 x LC1D80	LRD3359	48...65
37	66	100	—	—	—	GV4L80	80	640	3 x LC1D80	LRD3363	63...80
—	—	—	45	76	70	GV4L80	80	800	3 x LC1D80	LRD3363	63...80
45	80	100	—	—	—	GV4L115	115	805	3 x LC1D115	LR9D5367	60...100
—	—	—	55	90	70	GV4L115	115	920	3 x LC1D115	LR9D5367	60...100
55	97	100	—	—	—	GV4L115	115	920	3 x LC1D115	LR9D5369	90...150
55	97	<sup>(3)</sup>	—	—	—	NSX160●MA <sup>(3)</sup>	150	1200	3 x LC1D115	LR9D5369	90...150
—	—	—	75	125	<sup>(3)</sup>	NSX160●MA <sup>(3)</sup>	150	1200	3 x LC1D150	LR9D5369	90...150
75	132	<sup>(3)</sup>	90	146	<sup>(3)</sup>	NSX160●MA <sup>(3)</sup>	150	1200	3 x LC1D150	LR9D5369	90...150
90	160	<sup>(3)</sup>	110	178	<sup>(3)</sup>	NSX250●MA <sup>(3)</sup>	220	1760	3 x LC1F185	LR9F5371	132...220
110	195	<sup>(3)</sup>	—	—	—	NSX250●MA <sup>(3)</sup>	220	1760	3 x LC1F225	LR9F5371	132...220
—	—	—	132	215	<sup>(3)</sup>	NSX250●MA <sup>(3)</sup>	220	1760	3 x LC1F225	LR9F7375	200...330
132	230	<sup>(3)</sup>	160	256	<sup>(3)</sup>	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	2240	3 x LC1F265	LR9F7375	200...330
160	280	<sup>(3)</sup>	—	—	—	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	2560	3 x LC1F330	LR9F7375	200...330
—	—	—	200	321	<sup>(3)</sup>	NSX400● + Micrologic 1.3M <sup>(3)</sup>	320	2880	3 x LC1F330	LR9F7379	300...500
200	350	<sup>(3)</sup>	220	353	<sup>(3)</sup>	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	3150	3 x LC1F400	LR9F7379	300...500
220	388	<sup>(3)</sup>	250	401	<sup>(3)</sup>	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	3500	3 x LC1F400	LR9F7379	300...500
250	430	<sup>(3)</sup>	—	—	—	NSX630● + Micrologic 1.3M <sup>(3)</sup>	500	4000	3 x LC1F500	LR9F7379	300...500

<sup>(1)</sup> I<sub>rm</sub>: setting current of the magnetic trip.

<sup>(2)</sup> For mounting 3 contactors LC1D●●A, star-delta starter kit LAD9SD3 must be ordered separately, see page B8/29.

<sup>(3)</sup> Products marketed under the Merlin Gerin brand. Reference to be completed by replacing the ● with the breaking performance code:

Breaking performance I <sub>q</sub> (kA)	NSX100●MA		NSX160●MA, NSX250●MA		NSX400●, NSX630●	
400/415 V	36	70	36	70	70	150
440 V	35	65	35	65	65	130
Code	F	H	F	H	H	L



# TeSys island motor starters

Standard, SIL starters - Power interface modules

IEC - Type 1 or 2 coordination with fuses - 690 V

690 V - Type 1 or 2 coordination with fuses			
Applications with 3-phase motors 50-60 Hz in category AC-3	aM fuses	Standard Starters SIL Starters Power Interface Modules	
690 V	Rating	References	Setting range
I <sub>q</sub>			
kA	A		A
80	≤10	TPRST009 TPRSS009 TPRPM009	0.18-9
	≤25	TPRST025 TPRSS025 -	0.5-25
	≤40	TPRST038 TPRSS038 TPRPM038	0.76-38
	≤80	TPRST065 TPRSS065 -	3.25-65
	≤80	TPRST080 TPRSS080 TPRPM080	4-80

Coordination  
and  
standards



# TeSys island motor starters

## Standard, SIL starters - Power interface modules

### IEC - Type 1 coordination with circuit breakers - 230 V

0.06 to 22 kW at 230 V: Type 1 coordination					
Applications power ratings of 3-phase motors 50-60 Hz in category AC-3			Circuit breaker (Trip class 5 to 15)	Standard Starters SIL Starters Power Interface Modules	
230 V			References	References	Setting range
P	I <sub>e</sub>	I <sub>q</sub>			
kW	A	kA			A
0.06	0.35	100	GV2L03	TPRST009 TPRSS009 TPRPM009	0.18-9
0.09	0.52	100	GV2L04	TPRST009 TPRSS009 TPRPM009	0.18-9
0.12	0.7	100	GV2L05	TPRST009 TPRSS009 TPRPM009	0.18-9
0.18	1	100	GV2L06	TPRST009 TPRSS009 TPRPM009	0.18-9
0.25	1.5	100	GV2L06	TPRST009 TPRSS009 TPRPM009	0.18-9
0.37	1.9	100	GV2L07	TPRST009 TPRSS009 TPRPM009	0.18-9
0.55	2.6	100	GV2L08	TPRST009 TPRSS009 TPRPM009	0.18-9
0.75	3.3	100	GV2L08	TPRST009 TPRSS009 TPRPM009	0.18-9
1.1	4.7	100	GV2L10	TPRST009 TPRSS009 TPRPM009	0.18-9
1.5	6.3	100	GV2L14	TPRST009 TPRSS009 TPRPM009	0.18-9
2.2	8.5	100	GV2L14	TPRST009 TPRSS009 TPRPM009	0.18-9
3	11.3	100	GV2L16	TPRST025 TPRSS025 TPRPM038	0.5-25 / 0.76-38
4	15	100	GV2L20	TPRST025 TPRSS025 TPRPM038	0.5-25 / 0.76-38
5.5	20	50	GV2L22	TPRST025 TPRSS025 TPRPM038	0.5-25 / 0.76-38
7.5	27	50	GV2L32	TPRST038 TPRSS038 TPRPM038	0.76-38
9	32	100	GV3L40	TPRST038 TPRSS038 TPRPM038	0.76-38
11	38	100	GV3L40	TPRST065 TPRSS065 TPRPM080	3.25-65 / 4-80
15	51	100	GV3L65	TPRST065 TPRSS065 TPRPM080	3.25-65 / 4-80
18.5	61	100	GV3L65	TPRST065 TPRSS065 TPRPM080	3.25-65 / 4-80
22	72	100	GV3L73	TPRPM080	4-80



# TeSys island motor starters

Standard, SIL starters

IEC - Type 2 coordination with circuit breakers - 230 V

0.06 to 22 kW at 230 V: Type 2 coordination					
Applications power ratings of 3-phase motors 50-60 Hz in category AC-3			Circuit breaker (Trip class 5 to 15)	Standard Starters SIL Starters	
230 V			References	References	Setting range
P	I <sub>e</sub>	I <sub>q</sub>			
kW	A	kA			A
0.06	0.35	100	GV2L03	TPRST009 TPRSS009	0.18-9
0.09	0.52	100	GV2L04	TPRST009 TPRSS009	0.18-9
0.12	0.7	100	GV2L05	TPRST009 TPRSS009	0.18-9
0.18	1	100	GV2L06	TPRST009 TPRSS009	0.18-9
0.25	1.5	100	GV2L06	TPRST009 TPRSS009	0.18-9
0.37	1.9	100	GV2L07	TPRST009 TPRSS009	0.18-9
0.55	2.6	100	GV2L08	TPRST009 TPRSS009	0.18-9
0.75	3.3	100	GV2L08	TPRST025 TPRSS025	0.5-25
1.1	4.7	100	GV2L10	TPRST025 TPRSS025	0.5-25
1.5	6.3	100	GV2L14	TPRST025 TPRSS025	0.5-25
2.2	8.5	100	GV2L14	TPRST025 TPRSS025	0.5-25
3	11.3	100	GV2L16	TPRST025 TPRSS025	0.5-25
4	15	100	GV2L20	TPRST025 TPRSS025	0.5-25
5.5	20	50	GV2L22	TPRST025 TPRSS025	0.5-25
7.5	27	50	GV2L32	TPRST038 TPRSS038	0.76-38
9	32	100	GV3L40	TPRST038 TPRSS038	0.76-38
11	38	100	GV3L40	TPRST065 TPRSS065	3.25-65
15	51	100	GV3L65	TPRST065 TPRSS065	3.25-65
18.5	61	100	GV3L65	TPRST065 TPRSS065	3.25-65

Coordination  
and  
standards



# TeSys island motor starters

## Standard, SIL starters - Power interface modules

### IEC - Type 1 coordination with circuit breakers - 400/415 - 440 - 500 V

0.06 to 37 kW at 400/415 - 440 - 500 V: Type 1 coordination											
Applications power ratings of 3-phase motors 50-60 Hz in category AC-3									Circuit breaker (Trip class 5 to 15)	Standard Starters SIL Starters Power Interface Modules	
400/415 V			440 V			500 V			References	References	Setting range
P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>			
kW	A	kA	kW	A	kA	kW	A	kA			A
0.06	0.2	100	0.06	0.18	100	-	-	-	GV2L03	TPRST009 TPRSS009 TPRPM009	0.18-9
0.09	0.3	100	0.09	0.27	100	-	-	-			
0.12	0.44	100	0.12	0.4	100	-	-	-			
0.18	0.6	100	0.18	0.55	100	-	-	-	GV2L04	TPRST009 TPRSS009 TPRPM009	0.18-9
0.25	0.85	100	0.25	0.77	100	-	-	-			
0.37	1.1	100	-	-	-	0.37	0.88	100			
-	-	-	0.37	1	100	-	-	-	GV2L06	TPRST009 TPRSS009 TPRPM009	0.18-9
0.55	1.5	100	0.55	1.4	100	0.55	1.2	100			
-	-	-	-	-	-	0.75	1.5	100			
0.75	1.9	100	0.75	1.7	100	-	-	-	GV2L07	TPRST009 TPRSS009 TPRPM009	0.18-9
1.1	2.7	100	-	-	-	1.1	2.2	100			
-	-	-	1.1	2.4	100	-	-	-			
1.5	3.6	100	1.5	3.3	100	1.5	2.9	100	GV2L08	TPRST009 TPRSS009 TPRPM009	0.18-9
2.2	4.9	100	2.2	4.5	100	2.2	3.9	100			
-	-	-	3	5.9	100	3	5.2	100			
3	6.5	100	-	-	-	-	-	-	GV2L14	TPRST009 TPRSS009 TPRPM009	0.18-9
4	8.5	100	4	7.7	20	4	6.8	10			
-	-	-	-	-	-	5.5	9.2	10			
5.5	11.5	50	5.5	10.5	20	-	-	-	GV2L16	TPRST025 TPRSS025 TPRPM038	0.5-25 / 0.76-38
-	-	-	-	-	-	7.5	12.4	10			
7.5	15.5	50	7.5	14.1	20	-	-	-			
-	-	-	9	16.5	20	9	13.9	10	GV2L20	TPRST025 TPRSS025 TPRPM038	0.5-25 / 0.76-38
9	18.1	50	-	-	-	-	-	-			
11	22	50	11	20	20	11	17.6	10			
-	-	-	-	-	-	15	23	10	GV2L22	TPRST025 TPRSS025 TPRPM038	0.5-25 / 0.76-38
15	29	50	15	26.4	20	-	-	-			
-	-	-	-	-	-	18.5	28	10			
18.5	35	50	18.5	31.8	50	-	-	-	GV3L40	TPRST065 TPRSS065 TPRPM080	3.25-65 / 4-80
-	-	-	-	-	-	22	33	12			
22	41	50	22	37.3	50	-	-	-			
-	-	-	-	-	-	30	44	12	GV3L50	TPRST065 TPRSS065 TPRPM080	3.25-65 / 4-80
30	55	50	30	50	50	-	-	-			
-	-	-	37	60	50	37	53	12			
37	66	50	-	-	-	-	-	-	GV3L73	TPRST065 TPRSS065 TPRPM080	3.25-65 / 4-80

Coordination  
and  
standards



# TeSys island motor starters

## Standard, SIL starters

### IEC - Type 2 coordination with circuit breakers - 400/415 - 440 - 500 V

0.06 to 37 kW at 400/415 - 440 - 500 V: Type 2 coordination									
Applications power ratings of 3-phase motors 50-60 Hz in category AC-3									Circuit breaker (Trip class 5 to 15)
400/415 V			440 V			500 V			References
P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>	P	I <sub>e</sub>	I <sub>q</sub>	References
kW	A	kA	kW	A	kA	kW	A	kA	Setting range A
0.06	0.2	100	0.06	0.18	100	-	-	-	GV2L03
0.09	0.3	100	0.09	0.27	100	-	-	-	
0.12	0.44	100	0.12	0.4	100	-	-	-	GV2L04
0.18	0.6	100	0.18	0.55	100	-	-	-	
0.25	0.85	100	0.25	0.77	100	-	-	-	GV2L05
0.37	1.1	100	-	-	-	0.37	0.88	100	
-	-	-	0.37	1	100	-	-	-	GV2L06
0.55	1.5	100	0.55	1.4	100	0.55	1.2	100	
-	-	-	-	-	-	0.75	1.5	100	GV2L07
0.75	1.9	100	0.75	1.7	100	-	-	-	
-	-	-	-	-	-	1.1	2.2	100	GV2L07
1.1	2.7	100	-	-	-	-	-	-	
-	-	-	1.1	2.4	100	-	-	-	GV2L08
-	-	-	-	-	-	1.5	2.9	100	
1.5	3.6	100	1.5	3.3	100	-	-	-	GV2L08
2.2	4.9	100	2.2	4.5	100	2.2	3.9	100	
-	-	-	3	5.9	100	3	5.2	100	GV2L10
3	6.5	100	-	-	-	-	-	-	
4	8.5	100	4	7.7	20	4	6.8	10	GV2L14
-	-	-	-	-	-	5.5	9.2	10	
5.5	11.5	50	5.5	10.5	20	-	-	-	GV2L16
-	-	-	-	-	-	7.5	12.4	10	
7.5	15.5	50	7.5	14.1	20	-	-	-	GV2L20
-	-	-	9	16.5	20	9	13.9	10	
9	18.1	50	-	-	-	-	-	-	GV2L22
11	22	50	11	20	20	11	17.6	10	
-	-	-	-	-	-	15	23	10	GV2L32
15	29	50	15	26.4	20	-	-	-	
-	-	-	-	-	-	18.5	28	10	GV3L40
18.5	35	50	18.5	31.8	50	-	-	-	
-	-	-	-	-	-	22	33	12	GV3L50
22	41	50	22	37.3	50	-	-	-	
-	-	-	-	-	-	30	44	12	GV3L65
30	55	50	30	50	50	-	-	-	
-	-	-	37	60	50	37	53	12	GV3L73
37	66	50	-	-	-	-	-	-	

Coordination  
and  
standards



# TeSys island motor starters

Standard, SIL starters - Power interface modules

IEC - Type 1 coordination with circuit breakers - 690 V

0.06 to 37 kW at 690 V: Type 1 coordination					
Applications power ratings of 3-phase motors 50-60 Hz in category AC-3			Circuit breaker (Trip class 5 to 15)	Standard Starters SIL Starters Power Interface Modules	
690 V			References	References	Setting range
P	I <sub>e</sub>	I <sub>q</sub>			
kW	A	kA			A
0.37	0.64	100	GV2L05	TPRST009 TPRSS009 TPRPM009	0.18-9
0.55	0.87	4	GV2L05	TPRST009 TPRSS009 TPRPM009	0.18-9
0.75	1.1	4	GV2L06	TPRST009 TPRSS009 TPRPM009	0.18-9
1.1	1.6	4	GV2L07	TPRST009 TPRSS009 TPRPM009	0.18-9
1.5	2.1	4	GV2L07	TPRST009 TPRSS009 TPRPM009	0.18-9
2.2	2.8	4	GV2L08	TPRST009 TPRSS009 TPRPM009	0.18-9
3	3.8	4	GV2L08	TPRST009 TPRSS009 TPRPM009	0.18-9
4	4.9	4	GV2L10	TPRST009 TPRSS009 TPRPM009	0.18-9
5.5	6.7	4	GV2L14	TPRST009 TPRSS009 TPRPM009	0.18-9
7.5	8.9	4	GV2L14	TPRST025 TPRSS025 TPRPM038	0.5-25 / 0.76-38
9	10.5	4	GV2L16	TPRST025 TPRSS025 TPRPM038	0.5-25 / 0.76-38
11	12.8	4	GV2L16	TPRST025 TPRSS025 TPRPM038	0.5-25 / 0.76-38
15	17	4	GV2L20	TPRST025 TPRSS025 TPRPM038	0.5-25 / 0.76-38
18.5	21	4	GV2L22	TPRST038 TPRSS038 TPRPM038	0.76-38
22	24	4	GV2L22	TPRST065 TPRSS065 TPRPM080	3.25-65 / 4-80
30	32	6	GV3L40	TPRST065 TPRSS065 TPRPM080	3.25-65 / 4-80
37	39	6	GV3L50	TPRST065 TPRSS065 TPRPM080	3.25-65 / 4-80

Coordination  
and  
standards



# TeSys island motor starters

Standard, SIL starters

IEC - Type 2 coordination with circuit breakers - 690 V

0.06 to 37 kW at 690 V: Type 2 coordination					
Applications power ratings of 3-phase motors 50-60 Hz in category AC-3			Circuit breaker (Trip class 5 to 15)	Standard Starters SIL Starters	
690 V			References	References	Setting range
P	Ie	Iq			
kW	A	kA			A
0.37	0.64	100	GV2L05	TPRST009 TPRSS009	0.18-9
0.55	0.87	4	GV2L05	TPRST009 TPRSS009	0.18-9
0.75	1.1	4	GV2L06	TPRST009 TPRSS009	0.18-9
1.1	1.6	4	GV2L07	TPRST009 TPRSS009	0.18-9
1.1	1.6	50	GV2L07 + LA9LB920	TPRST025 TPRSS025	0.5-25
1.5	2.1	4	GV2L07	TPRST009 TPRSS009	0.18-9
1.5	2.1	50	GV2L07 + LA9LB920	TPRST025 TPRSS025	0.5-25
2.2	2.8	4	GV2L08	TPRST025 TPRSS025	0.5-25
2.2	2.8	50	GV2L08 + LA9LB920	TPRST025 TPRSS025	0.5-25
3	3.8	4	GV2L08	TPRST025 TPRSS025	0.5-25
3	3.8	50	GV2L08 + LA9LB920	TPRST025 TPRSS025	0.5-25
4	4.9	4	GV2L10	TPRST025 TPRSS025	0.5-25
4	4.9	50	GV2L10 + LA9LB920	TPRST025 TPRSS025	0.5-25
5.5	6.7	4	GV2L14	TPRST025 TPRSS025	0.5-25
5.5	6.7	50	GV2L14 + LA9LB920	TPRST025 TPRSS025	0.5-25
7.5	8.9	4	GV2L14	TPRST025 TPRSS025	0.5-25
7.5	8.9	50	GV2L14 + LA9LB920	TPRST025 TPRSS025	0.5-25
9	10.5	4	GV2L16	TPRST025 TPRSS025	0.5-25
11	12.8	4	GV2L16	TPRST025 TPRSS025	0.5-25
11	12.8	3	GV3L18+LA9LB920	TPRST038 TPRSS038	0.76-38
15	17	4	GV2L20	TPRST025 TPRSS025	0.5-25
15	17	3	GV2L22 + LA9LB920	TPRST038 TPRSS038	0.76-38
18.5	21	4	GV2L22	TPRST038 TPRSS038	0.76-38
18.5	21	3	GV3L25 + LA9LB920	TPRST065 TPRSS065	3.25-65
22	24	4	GV2L22	TPRST065 TPRSS065	3.25-65
22	24	3	GV2L32 + LA9LB920	TPRST065 TPRSS065	3.25-65
30	32	6	GV3L40	TPRST065 TPRSS065	3.25-65
37	39	6	GV3L50	TPRST065 TPRSS065	3.25-65

Coordination  
and  
standards



# TeSys island motor starters

## Standard, SIL starters - Power interface modules

### UL - SCCR Ratings

Short Circuit Current Ratings (SCCR)								Standard Starters SIL Starters Power Interface Modules	
UL File E39281 and File E48539 Suitable for use on a circuit delivering not more than:									
High SCCR						Standard SCCR			
Max Voltage 600 V Class J Fuse <sup>(1)</sup>		Max Voltage 480 V Circuit Breaker		Max Voltage 600 V Circuit Breaker		Max Voltage 600 V Circuit Breaker or Fuse		References	Setting range
SCCR	Maximum Amperage	SCCR	Maximum Amperage	SCCR	Maximum Amperage	SCCR	Maximum Amperage		
kA	A	kA	A	kA	A	kA	A		A
100	25	85	35	50	35	5	35	TPRST009 TPRSS009 TPRPM009	0.18-9
100	60	85	60	50	60	5	100	TPRST025 TPRSS025	0.5-25
100	100	85	60	50	60	5	125	TPRST038 TPRSS038 TPRPM038	0.76-38
100	125	85	110	50	110	5	250	TPRST065 TPRSS065	3.25-65
100	125	85	110	50	110	5	250	TPRST080 TPRSS080 TPRPM080	4-80

<sup>(1)</sup> When protected by any Class J or CC time-delay fuse (Class CC applicable up to 30 A only).

Group Motor Rating					
Suitable for group installation on a circuit delivering not more than:				Standard Starters SIL Starters	
Max voltage 600 V - Class J Fuse <sup>(1)</sup>		Max voltage 480 V - Circuit Breaker		References	Setting range
SCCR	Maximum Amperage	SCCR	Maximum Amperage		
kA	A	kA	A		A
5	90	5	90	TPRST009 TPRSS009	0.18-9
5	175	5	175	TPRST025 TPRSS025	0.5-25
5	175	5	175	TPRST038 TPRSS038	0.76-38
5	600	5	600	TPRST065 TPRSS065	3.25-65
5	600	5	600	TPRST080 TPRSS080	4-80

<sup>(1)</sup> When protected by any Class J or CC time-delay fuse.



#### Contactor utilisation categories conforming to IEC 60947-1

The standard utilisation categories define the current values which the contactor must be able to make or break.

These values depend on:

- the type of load being switched: squirrel cage or slip ring motor, resistors,
- the conditions under which making or breaking takes place: motor stalled, starting or running, reversing, plugging.

#### a.c. applications

<b>Category AC-1</b>	<p>This category applies to all types of a.c. load with a power factor equal to or greater than 0.95 (<math>\cos \varphi \geq 0.95</math>).</p> <p>Application examples: heating, distribution.</p>
<b>Category AC-2</b>	<p>This category applies to starting, plugging and inching of slip ring motors.</p> <ul style="list-style-type: none"> <li>■ On closing, the contactor makes the starting current, which is about 2.5 times the rated current of the motor.</li> <li>■ On opening, it must break the starting current, at a voltage less than or equal to the mains supply voltage.</li> </ul>
<b>Category AC-3</b>	<p>This category applies to squirrel cage motors with breaking during normal running of the motor.</p> <ul style="list-style-type: none"> <li>■ On closing, the contactor makes the starting current, which is about 5 to 7 times the rated current of the motor.</li> <li>■ On opening, it breaks the rated current drawn by the motor.</li> </ul> <p>Application examples: all standard squirrel cage motors: lifts, escalators, conveyor belts, bucket elevators, compressors, pumps, mixers, air conditioning units, etc....</p>
<b>Category AC-4</b>	<p>This category covers applications with plugging and inching of squirrel cage and slip ring motors. The contactor closes at a current peak which may be as high as 5 or 7 times the rated motor current. On opening it breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe.</p> <p>Application examples: printing machines, wire drawing machines, cranes and hoists, metallurgy industry.</p>

#### d.c. applications

<b>Category DC-1</b>	<p>This category applies to all types of d.c. load with a time constant (L/R) of less than or equal to 1 ms.</p>
<b>Category DC-3</b>	<p>This category applies to starting, counter-current braking and inching of shunt motors. Time constant <math>\leq 2</math> ms.</p> <ul style="list-style-type: none"> <li>■ On closing, the contactor makes the starting current, which is about 2.5 times the rated motor current.</li> <li>■ On opening, the contactor must be able to break 2.5 times the starting current at a voltage which is less than or equal to the mains voltage. The slower the motor speed, and therefore the lower its back e.m.f., the higher this voltage. Breaking is difficult.</li> </ul>
<b>Category DC-5</b>	<p>This category applies to starting, counter-current braking and inching of series wound motors. Time constant <math>\leq 7.5</math> ms.</p> <p>On closing, the contactor makes a starting current peak which may be as high as 2.5 times the rated motor current. On opening, the contactor breaks this same current at a voltage which is higher, the lower the motor speed. This voltage can be the same as the mains voltage. Breaking is severe.</p>

#### Utilisation categories for auxiliary contacts & control relays conforming to IEC 60947-1

#### a.c. applications

<b>Category AC-14<sup>(1)</sup></b>	<p>This category applies to the switching of electromagnetic loads whose power drawn with the electromagnet closed is less than 72 VA.</p> <p>Application example: switching the operating coil of contactors and relays.</p>
<b>Category AC-15<sup>(1)</sup></b>	<p>This category applies to the switching of electromagnetic loads whose power drawn with the electromagnet closed is more than 72 VA.</p> <p>Application example: switching the operating coil of contactors.</p>

#### d.c. applications

<b>Category DC-13<sup>(2)</sup></b>	<p>This category applies to the switching of electromagnetic loads for which the time taken to reach 95 % of the steady state current (<math>T = 0.95</math>) is equal to 6 times the power P drawn by the load (with <math>P \leq 50</math> W).</p> <p>Application example: switching the operating coil of contactors without economy resistor.</p>
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<sup>(1)</sup> Replaces category AC-11.

<sup>(2)</sup> Replaces category DC-11.



# TeSys contactors

## Definitions and comments

### General - Coordination and standards

#### Definitions

##### Altitude

The rarefied atmosphere at high altitude reduces the dielectric strength of the air and hence the rated operational voltage of the contactor. It also reduces the cooling effect of the air and hence the rated operational current of the contactor (unless the temperature drops at the same time).

No derating is necessary up to 3000 m.

Derating factors to be applied above this altitude for main pole operational voltage and current (a.c. supply) are as follows.

Altitude	3500 m	4000 m	4500 m	5000 m
Rated operational voltage	0.90	0.80	0.70	0.60
Rated operational current	0.92	0.90	0.88	0.86

##### Ambient air temperature

The temperature of the air surrounding the device, measured near to the device.

The operating characteristics are given:

- with no restriction for temperatures between -5 and +55 °C,
- with restrictions, if necessary, for temperatures between -50 and +70 °C.

##### Rated operational current (Ie)

This is defined taking into account the rated operational voltage, operating rate and duty, utilisation category and ambient temperature around the device.

##### Rated conventional thermal current (Ith) <sup>(1)</sup>

The current which a closed contactor can sustain for a minimum of 8 hours without its temperature rise exceeding the limits given in the standards.

##### Permissible short time rating

The current which a closed contactor can sustain for a short time after a period of no load, without dangerous overheating.

##### Rated operational voltage (Ue)

This is the voltage value which, in conjunction with the rated operational current, determines the use of the contactor or starter, and on which the corresponding tests and the utilisation category are based. For 3-phase circuits it is expressed as the voltage between phases. Apart from exceptional cases such as rotor short-circuiting, the rated operational voltage Ue is less than or equal to the rated insulation voltage Ui.

##### Rated control circuit voltage (Uc)

The rated value of the control circuit voltage, on which the operating characteristics are based. For a.c. applications, the values are given for a near sinusoidal wave form (less than 5 % total harmonic distortion).

##### Rated insulation voltage (Ui)

This is the voltage value used to define the insulation characteristics of a device and referred to in dielectric tests determining leakage paths and creepage distances. As the specifications are not identical for all standards, the rated value given for each of them is not necessarily the same.

##### Rated impulse withstand voltage (Uimp)

The peak value of a voltage surge which the device is able to withstand without breaking down.

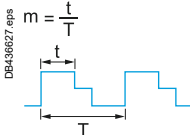
##### Rated operational power (expressed in kW)

The rated power of the standard motor which can be switched by the contactor, at the stated operational voltage.

<sup>(1)</sup> Conventional thermal current, in free air, conforming to IEC standards.

**Note:** these definitions are extracted from standard IEC 60947-1.



Definitions		
Rated breaking capacity <sup>(1)</sup>	This is the current value which the contactor can break in accordance with the breaking conditions specified in the IEC standard.	
Rated making capacity <sup>(1)</sup>	This is the current value which the contactor can make in accordance with the making conditions specified in the IEC standard.	
On-load factor (m)		This is the ratio between the time the current flows (t) and the duration of the cycle (T). Cycle duration: duration of current flow + time at zero current.
Pole impedance	The impedance of one pole is the sum of the impedance of all the circuit components between the input terminal and the output terminal. The impedance comprises a resistive component (R) and an inductive component (X = Lω). The total impedance therefore depends on the frequency and is normally given for 50 Hz. This average value is given for the pole at its rated operational current.	
Electrical durability	This is the average number of on-load operating cycles which the main pole contacts can perform without maintenance. The electrical durability depends on the utilisation category, the rated operational current and the rated operational voltage.	
Mechanical durability	This is the average number of no-load operating cycles (i.e. with zero current flow through the main poles) which the contactor can perform without mechanical failure.	

<sup>(1)</sup> For a.c. applications, the breaking and making capacities are expressed by the rms value of the symmetrical component of the short-circuit current. Taking into account the maximum asymmetry which may exist in the circuit, the contacts therefore have to withstand a peak asymmetrical current which may be twice the rms symmetrical component.

Note: these definitions are extracted from standard IEC 60947-1.



# TeSys contactors

## For utilisation category AC-3

### Selection - Coordination and standards

Operational current and power conforming to IEC ( $\theta \leq 60^\circ\text{C}$ )													
Contactor size			LC1/ LP1 K06	LC1/ LP1 K09	LC1 K12	LC1 K16	LC1 D09	LC1 D12	LC1 D18	LC1 D25	LC1 D32	LC1 D38	LC1 D40A
Maximum operational current in AC-3	$\leq 440\text{ V}$	<b>A</b>	6	9	12	16	9	12	18	25	32	38	40
Rated operational power P (standard motor power ratings)	220/240 V	<b>kW</b>	1.5	2.2	3	3	2.2	3	4	5.5	7.5	9	11
	380/400 V	<b>kW</b>	2.2	4	5.5	7.5	4	5.5	7.5	11	15	18.5	18.5
	415 V	<b>kW</b>	2.2	4	5.5	7.5	4	5.5	9	11	15	18.5	22
	440 V	<b>kW</b>	3	4	5.5	7.5	4	5.5	9	11	15	18.5	22
	500 V	<b>kW</b>	3	4	4	5.5	5.5	7.5	10	15	18.5	18.5	22
	660/690 V	<b>kW</b>	3	4	4	4	5.5	7.5	10	15	18.5	18.5	30
	1000 V	<b>kW</b>	–	–	–	–	–	–	–	–	–	–	–

Maximum operating rate in operating cycles/hour <sup>(1)</sup>													
On-load factor		Operational power					LC1 D09	LC1 D12	LC1 D18	LC1 D25	LC1 D32	LC1 D38	LC1 D40A
$\leq 85\%$	P	–	–	–	–	–	1200	1200	1200	1200	1000	1000	1000
	0.5 P	–	–	–	–	–	3000	3000	2500	2500	2500	2500	2500
$\leq 25\%$	P	–	–	–	–	–	1800	1800	1800	1800	1200	1200	1200

Operational current and power conforming to UL, CSA (θ ≤ 60 °C)												
Contactor size			LC1/ LP1 K06	LC1/ LP1 K09	LC1/ LP1 K12	LC1 D09	LC1 D12	LC1 D18	LC1 D25	LC1 D32	LC1 D38	LC1 D40A
Maximum operational current in AC-3	≤ 440 V	A	6	9	12	9	12	18	25	32	–	40
Rated operational power P (standard motor power ratings 60 Hz)	200/208 V	HP	1.5	2	3	2	3	5	7.5	10	–	10
	230/240 V	HP	1.5	3	3	2	3	5	7.5	10	–	10
	460/480 V	HP	3	5	7.5	5	7.5	10	15	20	–	30
	575/600 V	HP	3	5	10	7.5	10	15	20	25	–	30

(1) Depending on the operational power and the on-load factor ( $\theta \leq 60^\circ\text{C}$ ).

(2) Other values: please contact us.



LC1 D50A	LC1 D65A	LC1 D80A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 F1000	LC1 BL	LC1 BM	LC1 BP	LC1 BR
50	65	80	80	95	115	150	185	225	265	330	400	500	630	780	800	1000	750	1000	1500	1800
15	18,5	22	22	25	30	40	55	63	75	100	110	147	200	220	250	315	220	280	425	500
22	30	37	37	45	55	75	90	110	132	160	200	250	335	400	450	560	400	500	750	900
25	37	37	45	45	59	80	100	110	140	180	220	280	375	425	450	630	425	530	800	900
30	37	37	45	45	59	80	100	110	140	200	250	295	400	425	450	670	450	560	800	900
30	37	37	55	55	75	90	110	129	160	200	257	355	400	450	450	–	500	600	750	900
33	37	37	45	45	80	100	110	129	160	220	280	335	450	475	475	–	560	670	750	900
–	–	–	45	45	65	75	–	–	–	160	185	–	450	450	450	–	530	530	670	750

LC1 D50A	LC1 D65A	LC1 D80A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 F1000	LC1 BL	LC1 BM	LC1 BP	LC1 BR
1000	1000	1000	750	750	750	750	750	750	750	750	500	500	500	500	500	(2)	120	120	120	120
2500	2500	2500	2000	2000	2000	1200	2000	2000	2000	2000	1200	1200	1200	1200	600	(2)	120	120	120	120
1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	600	600	(2)	120	120	120	120

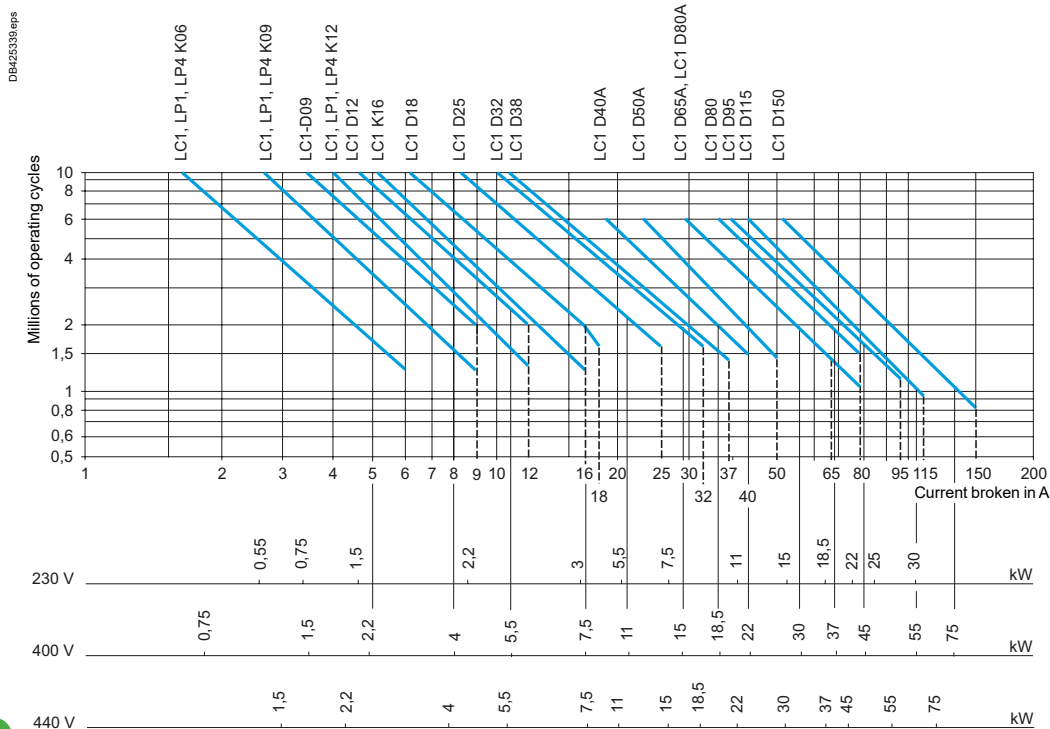
LC1 D50A	LC1 D65A	LC1 D80A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 F1000				
50	65	65	80	95	115	150	185	225	265	330	400	500	630	780	800	1000				
15	20	20	30	30	30	40	50	60	60	75	100	150	250	–	350	350				
15	20	20	30	30	40	50	60	75	75	100	125	200	300	450	400	400				
40	40	40	60	60	75	100	125	150	150	200	250	400	600	900	900	900				
40	50	50	60	60	100	125	150	150	200	250	300	500	800	900	900	–				



#### Selection according to required electrical durability, in category AC-3 ( $U_e \leq 440$ V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.

The current broken ( $I_c$ ) in category AC-3 is equal to the rated operational current ( $I_e$ ) of the motor.



Operational power in kW-50 Hz.

#### Example:

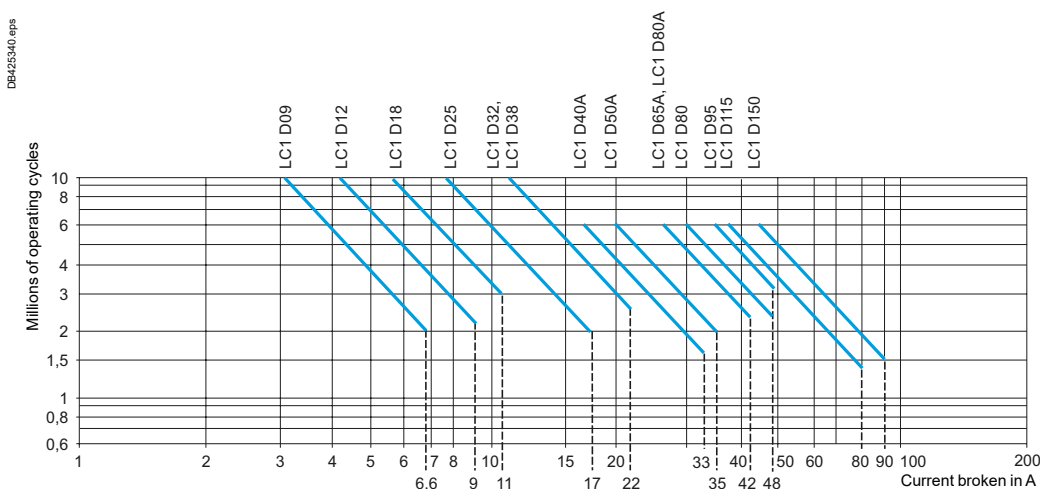
Asynchronous motor with  $P = 5.5$  kW -  $U_e = 400$  V -  $I_e = 11$  A -  $I_c = I_e = 11$  A  
or asynchronous motor with  $P = 5.5$  kW -  $U_e = 415$  V -  $I_e = 11$  A -  $I_c = I_e = 11$  A  
3 million operating cycles required.

The above selection curves show the contactor rating needed: LC1D18.

#### Selection according to required electrical durability, in category AC-3 ( $U_e = 660/690$ V) <sup>(1)</sup>

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.

The current broken ( $I_c$ ) in category AC-3 is equal to the rated operational current ( $I_e$ ) of the motor.



<sup>(1)</sup> For  $U_e = 1000$  V, use the 660/690 V curves, but do not exceed the operational current at the operational power indicated for 1000 V.



# TeSys contactors

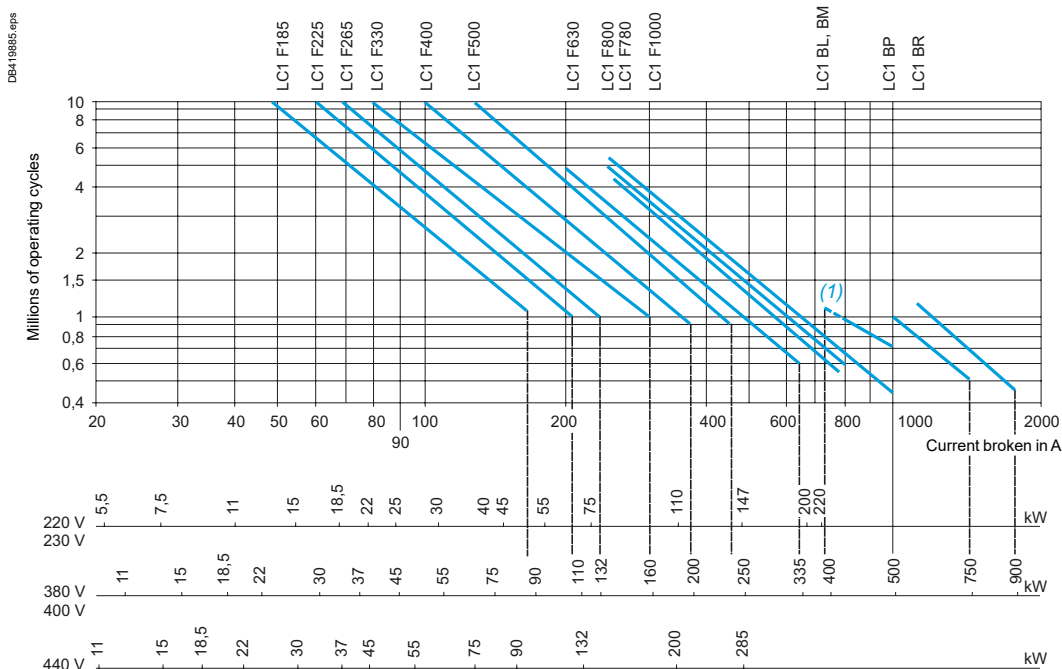
For utilisation category AC-3

## Selection - Coordination and standards

### Selection according to required electrical durability, in category AC-3 ( $U_e \leq 440$ V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.

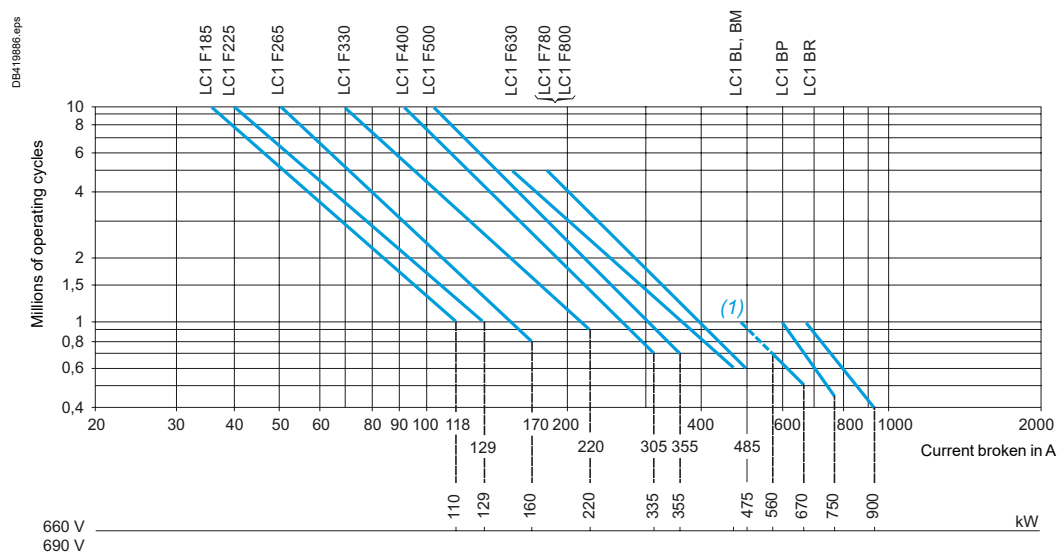
The current broken ( $I_c$ ) in category AC-3 is equal to the rated operational current ( $I_e$ ) of the motor.



### Selection according to required electrical durability, in category AC-3 ( $U_e = 660/690$ V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.

The current broken ( $I_c$ ) in category AC-3 is equal to the rated operational current ( $I_e$ ) of the motor.





#### Maximum operational current (open-mounted device)

Contactor size			LC1/ LP1 K09	LC1/ LP1 K12	LC1 D09	LC1 DT20	LC1 D12 DT25	LC1 D18 DT32	LC1 D25 DT40	LC1 D32	LC1 D38	LC1 D40A DT60A	LC1 D50A
Maximum operating rate in operating cycles/hour			600	600	600	600	600	600	600	600	600	600	600
Connection conforming to IEC 60947-1	Cable c.s.a.	mm <sup>2</sup>	4	4	4	4	4	6	6	10	10	35	35
	Bar c.s.a.	mm	—	—	—	—	—	—	—	—	—	—	—
Operational current in AC-1 in A, according to the ambient temperature conforming to IEC 60947-1	≤ 40 °C	A	20	20	25	20	25	32	40	50	50	60	80
	≤ 60 °C	A <sup>(4)</sup>	20	20	25	20	25	32	40	50	50	60	80
	≤ 70 °C	A <sup>(4)</sup>	(1)	(1)	17	(1)	17	22	28	35	35	42	56
Maximum operational power ≤ 60 °C	220/230 V	kW	8	8	9	8	9	11	14	18	18	21	29
	240 V	kW	8	8	9	8	9	12	15	19	19	23	31
	380/400 V	kW	14	14	15	14	15	20	25	31	31	37	50
	415 V	kW	14	14	17	14	17	21	27	34	34	41	54
	440 V	kW	15	15	18	15	18	23	29	36	36	43	58
	500 V	kW	17	17	20	17	20	23	33	41	41	49	65
	660/690 V	kW	22	22	27	22	27	34	43	54	54	65	80
	1000 V	kW	—	—	—	—	—	—	—	—	—	—	—

(1) Please consult your Regional Sales Office.

(2) With set of right-angled connectors LA9F2100.

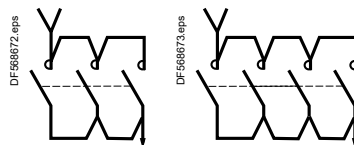
(3) With set of right-angled connectors LA9F2600.

(4) LC1F115 to LC1F2600: maximum coil control voltage must not exceed rated U<sub>c</sub> for temperature ≥ 60 °C.

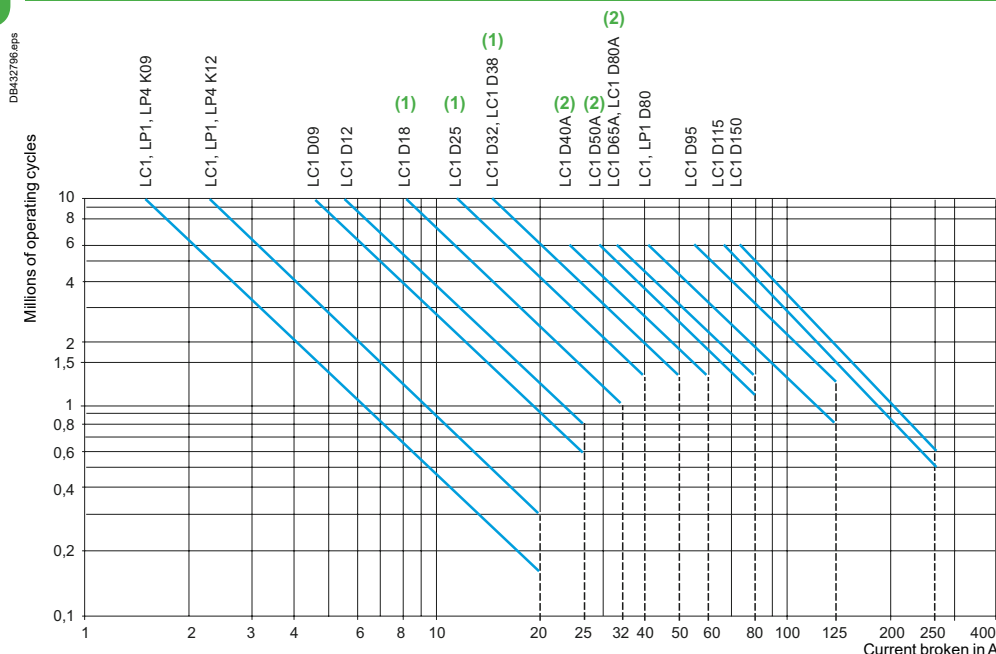
#### Increase in operational current by parallel connection of poles

Apply the following coefficients to the currents or power values given above; these coefficients take into account an often unbalanced current distribution between the poles:

- 2 poles in parallel: K = 1.6
- 3 poles in parallel: K = 2.25
- 4 poles in parallel: K = 2.8



#### Selection according to required electrical durability, in category AC-1 (U<sub>e</sub> ≤ 690 V)



(1) For TeSys D Green, consult online datasheets for values.

(2) For TeSys D Green or DC coil, consult online datasheets for values.

Control of resistive circuits (cos φ ≥ 0.95).

The current broken (I<sub>c</sub>) in category AC-1 is equal to the current (I<sub>e</sub>) normally drawn by the load.

#### Example:

- U<sub>e</sub> = 220 V - I<sub>e</sub> = 50 A θ ≤ 40 °C - I<sub>c</sub> = I<sub>e</sub> = 50 A
- 2 million operating cycles required
- the above selection curves show the contactor rating needed: LC1D50A.



# TeSys contactors

For utilisation category AC-1

## Selection - Coordination and standards

LC1 D65A D80A DT80A	LC1 LP1	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 F1000	LC1S F1200	LC1 F1250	LC1 F1400	LC1 F1700	LC1 F2100	LC1 F2600	LC1 BL	LC1 BM	LC1 BP	LC1 BR
600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	300	300	200	200	200	200	120	120	120	120
35	50	50	120	120	150	185	185	240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	2	2	2	2	2	3	2	2	2	3	4	3	2	2	2	2
-	-	-	-	-	-	-	-	-	30x5	40x5	60x5	100x5	60x5	100x5	50x8	100x5	100x5	100x5	100x5	100x10	50x5	80x5	100x5	100x10
80	125	125	250	250	275	315	350	400	500	700	1000	1600	1000	1250	1200	1260	1400	1700	2100 <sup>(2)</sup>	2600	800	1250	2000	2750
80	125	125	200	200	240	280	300	360	430	580	850	1350	850	<sup>(1)</sup>	1110	1060	1190	1450	1750 <sup>(2)</sup>	2600 <sup>(3)</sup>	700	1100	1750	2400
56	80	80	160	160	180	200	250	290	340	500	700	1100	700	<sup>(1)</sup>	1020	900	1080	1300	1500 <sup>(2)</sup>	2150 <sup>(3)</sup>	600	900	1500	2000
29	45	45	80	80	90	100	120	145	170	240	350	550	350	<sup>(1)</sup>	400	420	474	570	700	840	300	425	700	1000
31	49	49	83	83	100	110	125	160	180	255	370	570	370	<sup>(1)</sup>	410	440	490	600	780	920	330	450	800	1100
50	78	78	135	135	165	175	210	250	300	430	600	950	600	<sup>(1)</sup>	700	730	820	1000	1200	1450	500	800	1200	1600
54	85	85	140	140	170	185	220	260	310	445	630	1000	630	<sup>(1)</sup>	720	760	850	1050	1300	1580	525	825	1250	1700
58	90	90	150	150	180	200	230	290	330	470	670	1050	670	<sup>(1)</sup>	750	810	910	1100	1350	1680	550	850	1400	2000
65	102	102	170	170	200	220	270	320	380	502	750	1200	750	-	850	920	1000	1250	1550	1910	600	900	1500	2100
80	135	135	235	235	280	300	370	400	530	740	1000	1650	1000	-	1200	1260	1400	1700	2100	2520	800	1100	1900	2700
-	120	120	345	345	-	-	540	640	760	950	1500	2400	1500	-	-	-	2100	2500	3100 <sup>(2)</sup>	3820	1100	1700	3000	4200

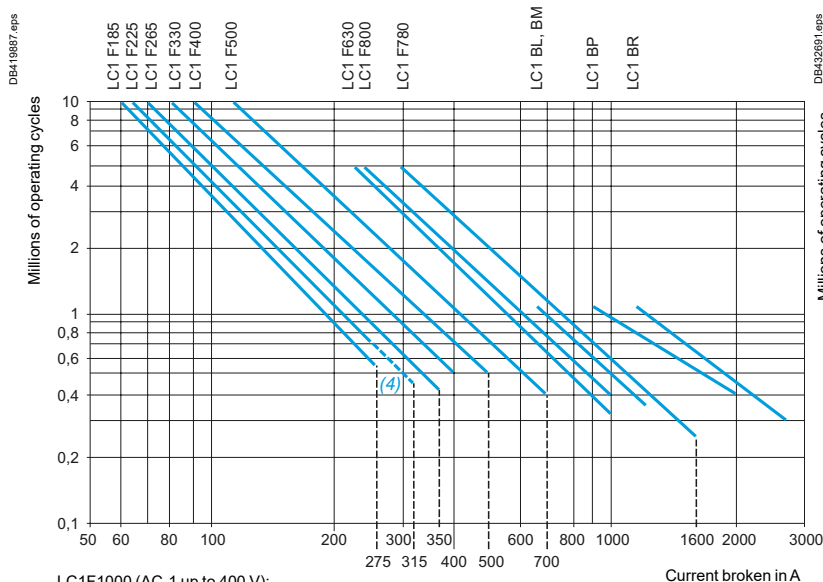
(1) Please consult your Regional Sales Office.

(2) With set of right-angled connectors LA9F2100.

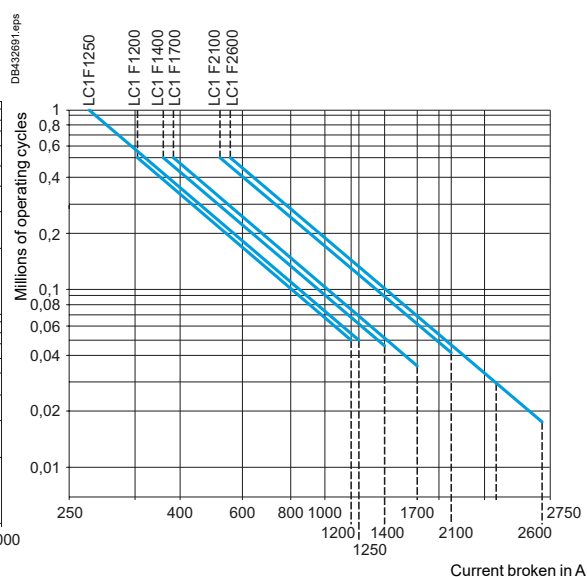
(3) With set of right-angled connectors LA9F2600.

(4) LC1F115 to LC1F2600: maximum coil control voltage must not exceed rated  $U_c$  for temperature  $\geq 60^\circ\text{C}$ .

### Selection according to required electrical durability, in category AC-1 ( $U_e \leq 690\text{ V}$ )



LC1F1000 (AC-1 up to 400 V):  
please contact your Regional Sales Office.



#### Example:

- $U_e = 220\text{ V}$  -  $I_e = 500\text{ A}$  -  $\theta \leq 40^\circ\text{C}$  -  $I_c = I_e = 500\text{ A}$
- 2 million operating cycles required
- the above selection curves show the contactor rating needed: LC1F780.

(1) Please consult your Regional Sales Office

(2) With set of right-angled connectors LA9F2100

(3) With set of right-angled connectors LA9F2600

(4) The dotted lines are only applicable to LC1F225.

Coordination  
and  
standards



# TeSys contactors

For utilisation categories AC-2 or AC-4

## Selection - Coordination and standards

### Maximum breaking current

Category AC-2: slip ring motors - breaking the starting current.

Category AC-4: squirrel cage motors - breaking the starting current.

Contactor size			LC1/ LP1 K06	LC1/ LP1 K09	LC1/ LP1 K12	LC1 D09	LC1 D12	LC1 D18	LC1 D25	LC1 D32	LC1 D38	LC1 D40A
In category AC-4 (I <sub>e</sub> max)	U <sub>e</sub> ≤ 440 V I <sub>e</sub> max broken = 6 x I motor	A	36	54	54	54	72	108	150	192	192	240
	440 V < U <sub>e</sub> ≤ 690 V I <sub>e</sub> max broken = 6 x I motor	A	26	40	40	40	50	70	90	105	105	150

### Depending on the maximum operating rate <sup>(1)</sup> and the on-load factor, θ ≤ 60 °C <sup>(2)</sup>

From 150 and 15 % to 300 and 10 %	A	20	30	30	30	40	45	75	80	80	110
From 150 and 20 % to 600 and 10 %	A	18	27	27	27	36	40	67	70	70	96
From 150 and 30 % to 1200 and 10 %	A	16	24	24	24	30	35	56	60	60	80
From 150 and 55 % to 2400 and 10 %	A	13	19	19	19	24	30	45	50	50	62
From 150 and 85 % to 3600 and 10 %	A	10	16	16	16	21	25	40	45	45	53

(1) Do not exceed the maximum number of operating cycles.

(2) For temperatures higher than 60 °C, use a maximum operating rate value equal to 80 % of the actual value when selecting from the tables.

### Counter current braking (plugging)

The current varies from the maximum plug-braking current to the rated motor current.

The making current must be compatible with the rated making and breaking capacities of the contactor.

As breaking normally takes place at a current value at or near the locked rotor current, the contactor can be selected using the criteria for categories AC-2 and AC-4.

### Permissible AC-4 power rating for 200 000 operating cycles

Operational voltage			LC●/ LP● K06	LC●/ LP● K09	LC●/ LP● K12	LC● D09	LC● D12	LC● D18	LC● D25	LC● D32	LC● D38	LC● D40A
220/230 V	kW	0.75	1.1	1.1	1.5	1.5	2.2	3	4	4	4	4
380/400 V	kW	1.5	2.2	2.2	2.2	3.7	4	5.5	7.5	7.5	9	9
415 V	kW	1.5	2.2	2.2	2.2	3	3.7	5.5	7.5	7.5	9	9
440 V	kW	1.5	2.2	2.2	2.2	3	3.7	5.5	7.5	7.5	11	11
500 V	kW	2.2	3	3	3	4	5.5	7.5	9	9	11	11
660/690 V	kW	3	4	4	4	5.5	7.5	10	11	11	15	15



# TeSys contactors

For utilisation categories AC-2 or AC-4

Selection - Coordination and standards

LC1 D50A	LC1 D65A	LC1 D80A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F26	LC1 F330	LC1 F40	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 BL	LC1 BM	LC1 BP	LC1 BR
300	390	390	480	570	630	830	1020	1230	1470	1800	2220	2760	3360	4260	3690	4320	5000	7500	9000
170	210	210	250	250	540	640	708	810	1020	1410	1830	2130	2760	2910	2910	4000	4800	5400	6600
140	160	160	200	200	280	310	380	420	560	670	780	1100	1400	1600	1600	2250	3000	4500	5400
120	148	148	170	170	250	280	350	400	500	600	700	950	1250	1400	1400	2000	2400	3750	5000
100	132	132	145	145	215	240	300	330	400	500	600	750	950	1100	1100	1500	2000	3000	3600
80	110	110	120	120	150	170	240	270	320	390	450	600	720	820	820	1000	1500	2000	2500
70	90	90	100	100	125	145	170	190	230	290	350	500	660	710	710	750	1000	1500	1800

LC● D50A	LC● D65A	LC1 D80A	LC● D80	LC● D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 BL	LC1 BM	LC1 BP	LC1 BR
5.5	7.5	7.5	7.5	9	9	11	18.5	22	28	33	40	45	55	63	63	90	110	150	200
11	11	11	15	15	18.5	22	33	40	51	59	75	80	100	110	110	160	160	220	250
11	11	11	15	15	18.5	22	37	45	55	63	80	90	100	110	110	160	160	250	280
11	15	15	15	15	18.5	22	37	45	59	63	80	100	110	132	132	160	200	250	315
15	15	15	22	22	30	37	45	55	63	75	90	110	132	150	150	180	200	250	355
15	18.5	18.5	25	25	30	45	63	75	90	110	129	140	160	185	185	200	250	315	450

Coordination  
and  
standards



# TeSys contactors

For utilisation categories AC-2 or AC-4

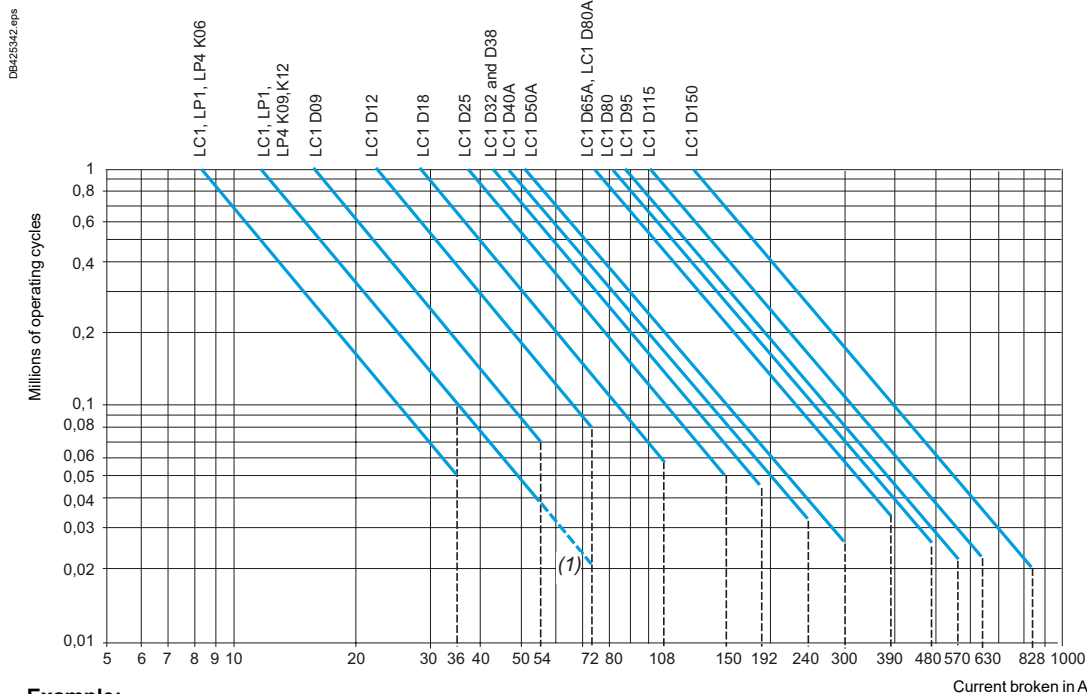
## Selection - Coordination and standards

### Selection according to required electrical durability, in categories AC-2 or AC-4 ( $U_e \leq 440$ V)

Control of 3-phase asynchronous squirrel cage motors (AC-4) or slip ring motors (AC-2) with breaking whilst motor stalled.

The current broken ( $I_c$ ) in AC-2 is equal to  $2.5 \times I_e$ .

The current broken ( $I_c$ ) in AC-4 is equal to  $6 \times I_e$  ( $I_e$  = rated operational current of the motor).



#### Example:

- asynchronous motor with  $P = 5.5$  kW -  $U_e = 400$  V -  $I_e = 11$  A.  $I_c = 6 \times I_e = 66$  A
- or asynchronous motor with  $P = 5.5$  kW -  $U_e = 415$  V -  $I_e = 11$  A.  $I_c = 6 \times I_e = 66$  A
- 200 000 operating cycles required
- the above selection curves show the contactor rating needed: LC1D25.

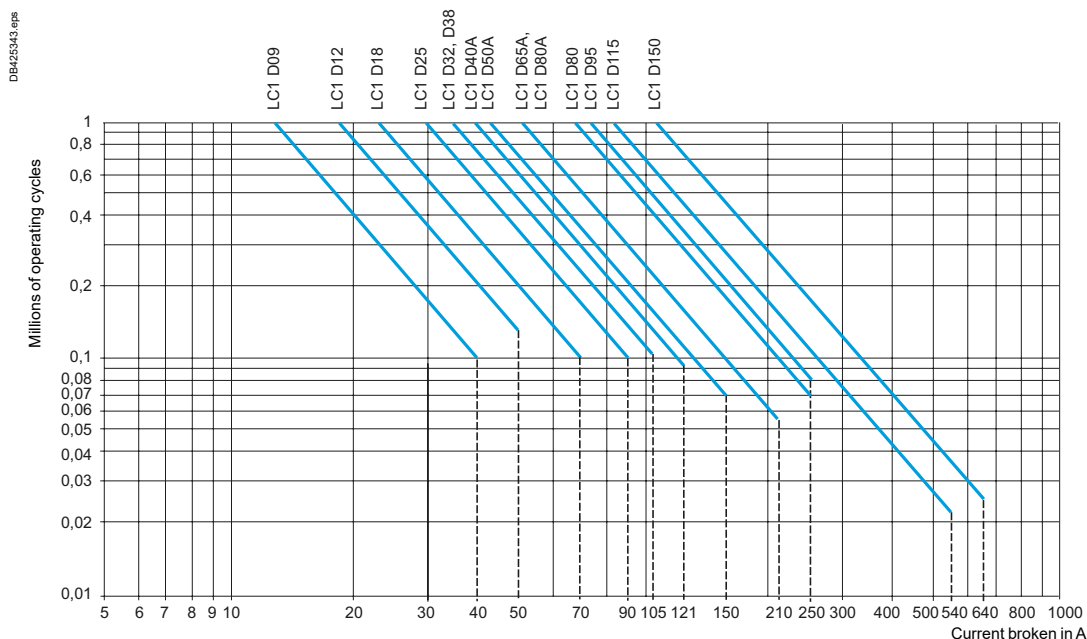
(1) The dotted lines are only applicable to LC1, LP1K12 contactors.

### Selection according to required electrical durability, use in category AC-4 ( $440$ V < $U_e \leq 690$ V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst motor stalled.

The current broken ( $I_c$ ) in AC-2 is equal to  $2.5 \times I_e$ .

The current broken ( $I_c$ ) in AC-4 is equal to  $6 \times I_e$  ( $I_e$  = rated operational current of the motor).





# TeSys contactors

For utilisation categories AC-2 or AC-4

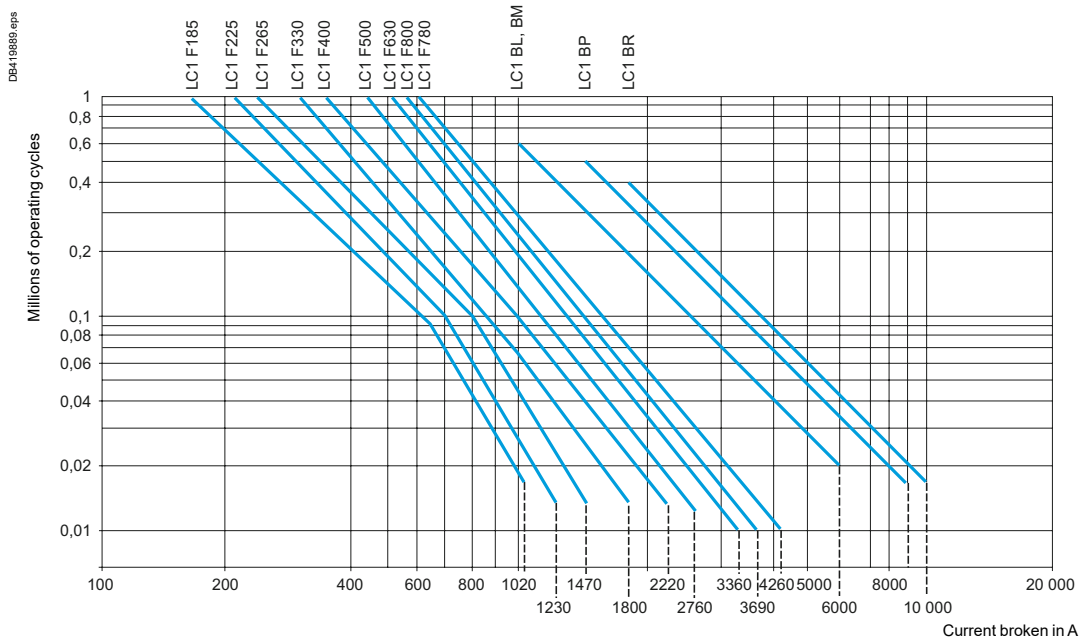
## Selection - Coordination and standards

### Selection according to required electrical durability, in categories AC-2 or AC-4 ( $U_e \leq 440$ V)

Control of 3-phase asynchronous squirrel cage motors (AC-4) or slip ring motors (AC-2) with breaking whilst motor stalled.

The current broken ( $I_c$ ) in AC-4 is equal to  $6 \times I_e$ .

( $I_e$  = rated operational current of the motor).



#### Example:

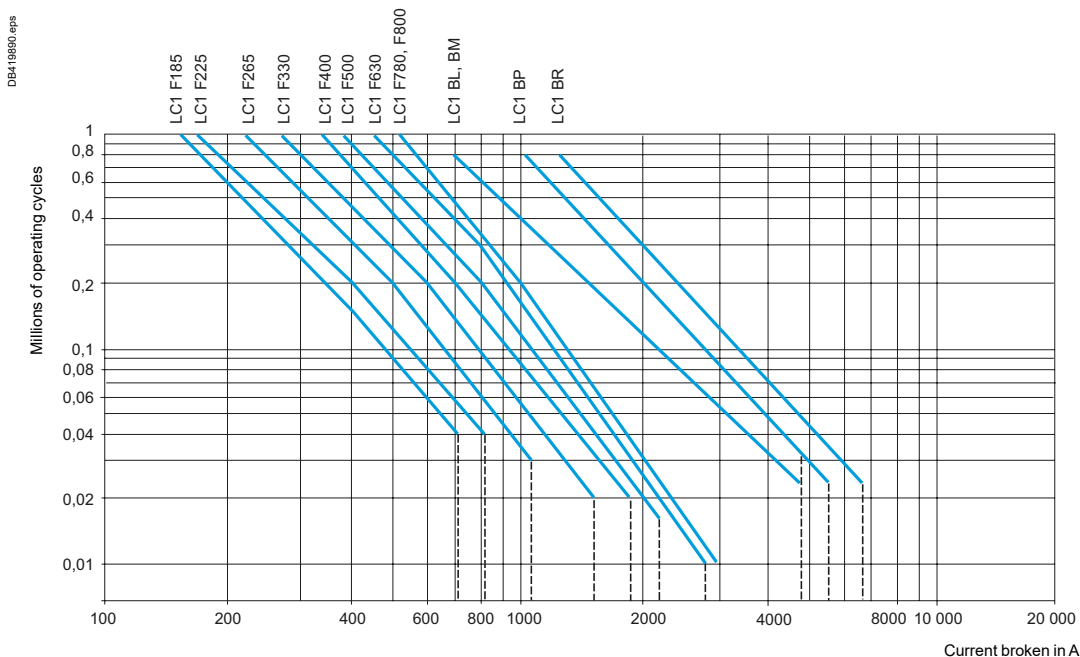
- asynchronous motor with  $P = 90$  kW -  $U_e = 380$  V -  $I_e = 170$  A.  $I_c = 6 \times I_e = 1020$  A.
- or asynchronous motor with  $P = 90$  kW -  $U_e = 415$  V -  $I_e = 165$  A.  $I_c = 6 \times I_e = 990$  A.
- 60 000 operating cycles required.
- the above selection curves show the contactor rating needed: LC1F265.

Coordination  
and  
standards

### Selection according to required electrical durability, use in category AC-4 ( $440$ V < $U_e \leq 690$ V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst motor stalled.

The current broken ( $I_c$ ) in AC-4 is equal to  $6 \times I_e$  ( $I_e$  = rated operational current of the motor).

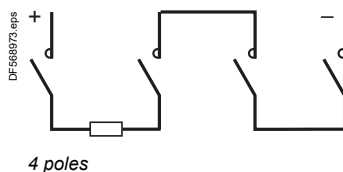
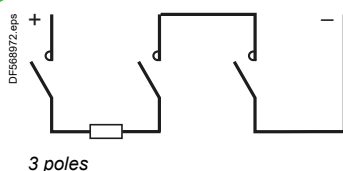
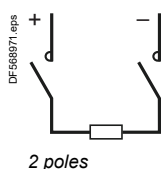
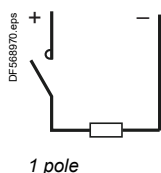




# TeSys contactors

For utilisation categories DC-1 to DC-5 <sup>(1)</sup>

## Selection - Coordination and standards



### Rated operational current (Ie) in Amperes, in utilisation category DC-1, resistive loads: time constant $\frac{L}{R} \leq 1$ ms, ambient temperature $\leq 60$ °C

Rated operational voltage Ue	No. of poles connec- ted in series	Contactor rating <sup>(1)</sup>								
		LC1 D09	LC1 DT20	LC1 D12 DT25	LC1 D18 DT32	LC1 D25 DT40	LC1 D32	LC1 D38	LC1 D40A	LC1 DT60A
V										
24	1	20	20	20	25	32	40	40	50	50
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	–	20	20	25	32	–	–	–	50
48/75	1	20	20	20	25	32	40	40	50	50
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	–	20	20	25	32	–	–	–	50
125	1	4	4	4	4	7	7	7	7	7
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	–	20	20	25	32	–	–	–	50
250	1	1	1	1	1	1	1	1	1	1
	2	4	4	4	4	7	7	7	7	7
	3	20	20	20	25	32	40	40	50	50
	4	–	20	20	25	32	–	–	–	50
300	3	4	4	4	4	7	7	7	7	–
	4	–	20	20	25	32	–	–	–	50
460	1	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–
900	2	–	–	–	–	–	–	–	–	–
1200	3	–	–	–	–	–	–	–	–	–
1500	4	–	–	–	–	–	–	–	–	–

### Rated operational current (Ie) in Amperes, in utilisation category DC-2 to DC-5, inductive loads: time constant $\frac{L}{R} \leq 15$ ms, ambient temperature $\leq 60$ °C

Rated operational voltage Ue	No. of poles connected in series	K								
		Contactor rating <sup>(1)</sup>								
V		LC1 D09	LC1 DT20	LC1 D12 DT25	LC1 D18 DT32	LC1 D25 DT40	LC1 D32	LC1 D38	LC1 D40A	LC1 DT60A
24	1	20	20	20	25	32	40	40	50	50
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	—	20	20	25	32	—	—	—	50
48/75	1	20	20	20	25	32	40	40	50	50
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	—	20	20	25	32	—	—	—	50
125	1	2	2	2	2	3	3	3	4	4
	2	20	20	20	25	32	40	40	50	50
	3	20	20	20	25	32	40	40	50	50
	4	—	20	20	25	32	—	—	—	50
250	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1
	2	2	2	2	2	3	3	3	4	4
	3	8	8	8	8	32	40	40	50	50
	4	—	20	20	25	32	—	—	—	50
300	3	2	2	2	2	3	3	3	3	3
	4	—	8	8	8	32	—	—	—	50
460	1	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
900	2	—	—	—	—	—	—	—	—	—
1200	3	—	—	—	—	—	—	—	—	—
1500	4	—	—	—	—	—	—	—	—	—

<sup>(1)</sup> TeSys D Green contactors are not validated for DC-1 to DC-5 applications.



# TeSys contactors

For utilisation categories DC-1 to DC-5 <sup>(1)</sup>

## Selection - Coordination and standards

LC1 D50A	LC1 D65A D80A	LC1 DT80A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 BL	LC1 BM	LC1 BP	LC1 BR
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
7	7	7	12	12	12	12	210	230	270	320	380	520	760	1180	760	700	1100	1750	2400
65	65	65	100	100	200	200	210	230	270	320	380	520	760	1180	760	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
1	1.5	1.5	2	2	10	10	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
7	7	7	12	12	200	200	190	200	250	280	350	450	700	1000	700	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
7	7	7	12	12	200	200	190	200	250	280	350	450	700	1000	700	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1000	850	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	200	–	190	200	250	280	350	450	700	1000	700	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400

Coordination  
and  
standards

LC1 D50A	LC1 D65A D80A	LC1 DT80A	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 BL	LC1 BM	LC1 BP	LC1 BR
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	–	–	–	–
65	65	65	100	100	200	200	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
4	4	4	5	5	10	10	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
65	65	65	100	100	200	200	160	180	250	300	350	500	700	1000	700	700	1100	1750	2400
65	65	65	100	100	200	200	240	240	280	310	350	550	850	1000	850	700	1100	1750	2400
–	–	65	100	–	200	–	240	240	280	310	350	550	850	1000	850	700	1100	1750	2400
1	1.5	1.5	1	1	3	3	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
4	4	4	5	5	200	200	140	160	220	280	310	480	680	900	680	700	1100	1750	2400
65	65	65	100	100	200	200	160	180	250	300	350	500	700	1000	700	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
3	3	3	5	5	200	200	140	160	220	280	310	480	680	900	680	700	1100	1750	2400
–	–	65	100	–	200	–	240	260	300	360	430	580	850	1300	850	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	200	–	140	160	220	280	310	480	680	800	680	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	700	1100	1750	2400



#### Selection according to required electrical durability, use in categories DC-1 to DC-5

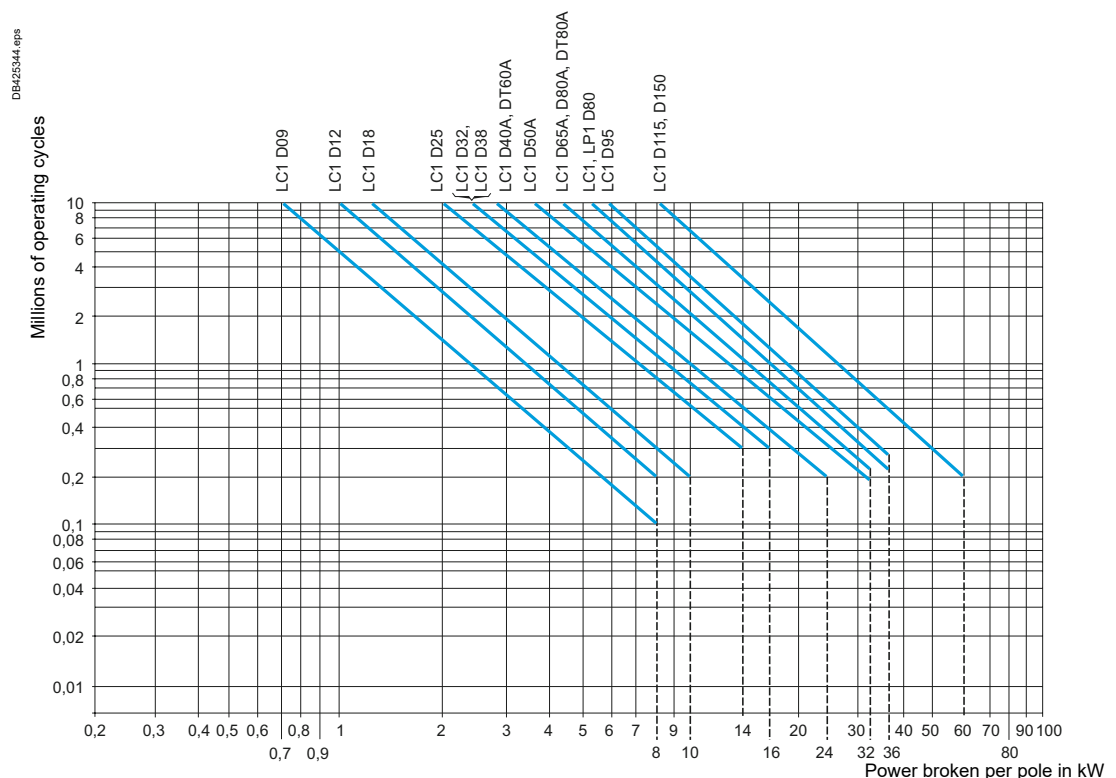
The criteria for contactor selection are:

- the rated operational current  $I_e$
- the rated operational voltage  $U_e$
- the utilisation category and the time constant L/R
- the required electrical durability.

#### Maximum operating rate (operating cycles)

The following limits must not be exceeded: 120 operating cycles/hour at rated operational current  $I_e$ .

#### Electrical durability <sup>(1)</sup>



<sup>(1)</sup> TeSys D Green contactors are not validated for DC-1 to DC-5 applications

#### Example

Series wound motor -  $P = 1.5 \text{ kW}$  -  $U_e = 200 \text{ V}$  -  $I_e = 7.5 \text{ A}$ .

Utilisation: reversing, inching.

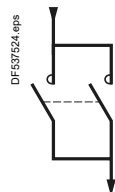
■ Utilisation category = DC-5.

■ Select contactor LC1D09 with 3 poles in series.

■ The power broken is:  $P_c \text{ total} = 2.5 \times 200 \times 7.5 = 3.75 \text{ kW}$ .

■ The power broken per pole is:  $1.25 \text{ kW}$ .

■ The electrical durability read from the curve is  $\geq 3$  millions of operating cycles.



#### Use of poles in parallel

Electrical durability can be increased by using poles connected in parallel.

With  $N$  poles connected in parallel, the electrical durability becomes: electrical durability read from the curves  $\times N \times 0.7$ .

#### Note:

When the poles are connected in parallel, the maximum operational currents indicated on pages A6/46 and A6/47 must not be exceeded.

#### Note:

Ensure that the connections are made in such a way as to equalise the currents in each pole.



## Selection according to required electrical durability, use in categories DC-1 to DC-5

### Determining the electrical durability

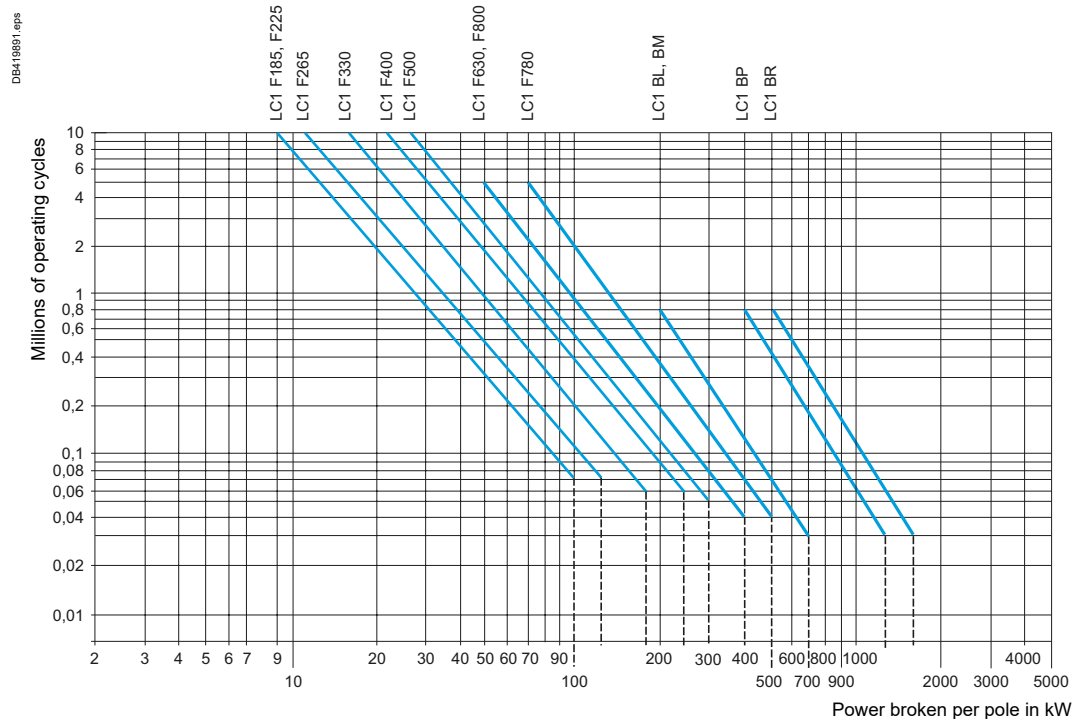
The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:

$P_{\text{broken}} = U_{\text{broken}} \times I_{\text{broken}}$

The tables below give the values of  $U_c$  and  $I_c$  for the various utilisation categories.

#### Power broken

Utilisation categories	U broken	I broken	P broken
DC-1 Non inductive or slightly inductive loads	$U_e$	$I_e$	$U_e \times I_e$
DC-2 Shunt wound motors, breaking whilst motor running	$0.1 U_e$	$I_e$	$0.1 U_e \times I_e$
DC-3 Shunt wound motors, reversing, inching	$U_e$	$2.5 I_e$	$U_e \times 2.5 I_e$
DC-4 Series wound motors, breaking whilst motor running	$0.3 U_e$	$I_e$	$0.3 U_e \times I_e$
DC-5 Series wound motors, reversing, inching	$U_e$	$2.5 I_e$	$U_e \times 2.5 I_e$



### Example

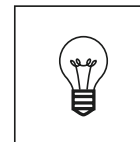
Series wound motor:  $P = 40 \text{ kW}$  -  $U_e = 200 \text{ V}$  -  $I_e = 200 \text{ A}$ .

Utilisation: reversing, inching.

Utilisation category = DC-5.

- Select contactor LC1 F265 with 2 poles in series.
- The power broken is:  $P_c \text{ total} = 2.5 \times 200 \times 200 = 100 \text{ kW}$ .
- The power broken per pole is  $50 \text{ kW}$ .
- The electrical durability read from the curve is 500000 operating cycles.





## General

The operating conditions of lighting circuits have the following characteristics:

- continuous duty: the switching device can remain closed for several days or even months
- a dispersion factor of 1: all luminaires in the same group are switched on or off simultaneously
- a relatively high temperature around the device due to the enclosure, the presence of fuses, or an unventilated control panel location.

This is why the operational current for lighting is lower than the value given for AC-1 duty.

## Protection

The continuous duty current drawn by a lighting circuit is constant. In fact:

- it is unlikely that the number of luminaires of an existing circuit will be modified
- this type of circuit cannot create an overload of long duration.

It is therefore only necessary to provide short-circuit protection.

This can be provided by:

- gG type fuses, or
- modular circuit breakers.

Nevertheless, it is always possible and sometimes more economical (smaller cable size) to protect the circuit by a thermal overload relay and associated aM type uses.

## Distribution system

### Single-phase circuit, 220/240 V

The tables on pages A6/51 to A6/55 are based on a single-phase 220/240 V circuit and can therefore be applied directly in this case.

### 3-phase circuit, 380/415 V (with neutral)

The total number of lamps (N) to be switched simultaneously is divided into three equal groups, each connected between one phase and neutral. The contactor can then be selected from the 220/240 V single-phase tables for a number of lamps equal to  $\frac{N}{3}$  lamps.

### 3-phase circuit, 220/240 V

The total number of lamps (N) to be switched simultaneously is divided into three equal groups, each connected between 2 phases (L1-L2), (L2-L3), (L3-L1).

The contactor can then be selected from the 220/240 V single-phase table for a number of lamps equal to  $\frac{N}{\sqrt{3}}$  lamps.

## Contactor selection tables

For the different types of lamps, the tables on pages A6/51 to A6/55 give the maximum number of lamps of unit power P (in Watts), which can be switched simultaneously for each size of contactor.

They are based on:

- a 220/240 V single-phase circuit
- an ambient temperature of 55 °C <sup>(2)</sup>, taking into account the operating conditions (see General paragraph)
- an electrical life of more than 10 years (200 days' operation per year).

They take into account:

- the total current drawn (including ballast)
- transient phenomena which occur at switch-on
- the starting currents and their duration
- the circulation of any harmonics which may be present.

### Lamps with compensating capacitor C (μF) connected in parallel

Parallel connected compensating capacitors C cause a current peak at the moment of switch-on. To ensure that the value of this current peak remains compatible with the making characteristics of the contactors, the unit value of the capacitance must not exceed the following:

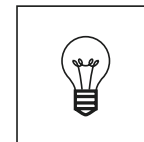
Switching contactor rating <sup>(1)</sup>	LC1 K09	LP1 K09	LC1 D09	LC1 D12	LC1 D18	LC1 D25	LC1 D32	LC1 D38	LC1 D40A	LC1 D50A	LC1 D65A	LC1 D80A	LC1 D80
Maximum unit value C (μF) of parallel connected compensating capacitor	7	3	18	18	25	60	96	96	120	120	240	240	240
Switching contactor rating <sup>(1)</sup>	LC1 D80	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F800	
Maximum unit value C (μF) of parallel connected compensating capacitor	240	240	300	360	800	1200	1700	2500	4000	6000	9000	10800	

This value is independent of the number of lamps switched by the contactor.

<sup>(1)</sup> Validation tests have not been carried out with TeSys D Green contactors.

<sup>(2)</sup> For an ambient temperature of 40 °C, multiply the number by 1.2.





#### Usual values

The tables show the following values:

- IB: value of current drawn by each lamp at its rated voltage,
  - C: unit capacitance for each lamp,
- corresponding to the values normally quoted by lamp manufacturers.

These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

#### Incandescent and halogen lamps

P (W)	60	75	100	150	200	300	500	750	1000	
IB (A)	0.27	0.34	0.45	0.68	0.91	1.40	2.30	3.40	4.60	LC1 <sup>(1)</sup>
Max. no. of lamps according to P (W)	35	28	21	14	10	6	4	2	2	K09
	59	47	35	23	17	11	7	4	3	D09, D12
	77	61	46	30	23	15	9	6	4	D18
	92	73	55	36	27	18	11	7	5	D25
	129	103	77	51	38	25	15	10	7	D32, D38
	163	129	97	64	48	31	19	13	9	D40A
	207	164	124	82	62	40	24	16	12	D50A, D65A, D80A
	296	235	177	117	88	57	34	23	17	D80, D95
	430	340	256	170	126	82	50	34	24	D115
	466	370	280	184	138	90	54	36	26	D150
	710	564	426	282	210	136	82	56	40	F185
	770	610	462	304	228	148	90	60	44	F225
	888	704	532	352	262	170	104	70	52	F265
	1006	800	604	400	298	194	118	80	58	F330
	1274	1010	764	504	378	244	148	100	74	F400
	1718	1364	1030	682	508	330	200	136	100	F500
	2328	1850	1396	924	690	448	272	184	136	F630
	2776	2204	1666	1102	824	534	326	220	162	F800

#### Mixed lighting lamps

P (W)	100	160	250	500	1000	
IB (A)	0.45	0.72	1.10	2.30	4.50	LC1 <sup>(1)</sup>
Max. no. of lamps according to P (W)	21	13	8	4	2	K09
	35	22	14	7	3	D09, D12
	46	29	18	9	4	D18
	55	36	23	11	5	D25
	77	48	30	15	7	D32, D38
	97	61	38	19	9	D40A
	124	77	49	24	12	D50A, D65A, D80A
	177	111	70	34	17	D80, D95
	256	160	104	50	26	D115
	280	174	114	54	28	D150
	426	266	174	82	42	F185
	462	288	188	90	46	F225
	532	332	218	104	52	F265
	604	378	246	118	60	F330
	764	478	312	150	76	F400
	1030	644	422	202	102	F500
	1398	874	572	272	140	F630
	1666	1040	680	326	166	F800

<sup>(1)</sup> Validation tests have not been carried out with TeSys D Green contactors.





#### Usual values

The tables show the following values:

■ IB: value of current drawn by each lamp at its rated voltage

■ C: unit capacitance for each lamp corresponding to the values normally quoted by lamp manufacturers.

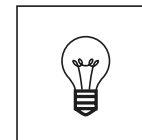
These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

Fluorescent lamps with starter. Single fitting											
Non corrected					With parallel correction						LC1 <sup>(1)</sup> K09 D09, D12 D18 D25 D32, D38 D40A D50A, D65A, D80A D80, D95 D115, D150 F185 F225 F265 F330 F400 F500 F630, F800
P (W)	20	40	65	80	110	20	40	65	80	110	
IB (A)	0.39	0.45	0.70	0.80	1.2	0.17	0.26	0.42	0.52	0.72	
C (μF)	—	—	—	—	—	5	5	7	7	16	
Max. no. of lamps according to P (W)	24	21	13	12	8	56	36	22	18	—	
	41	35	22	20	13	94	61	38	30	22	
	53	46	30	26	17	123	80	50	40	29	
	66	57	37	32	21	152	100	61	50	36	
	89	77	50	43	29	205	134	83	67	48	
	112	97	62	55	36	258	169	104	84	61	
	143	124	80	70	46	329	215	133	107	77	
	205	177	114	100	66	470	367	190	153	111	
	410	354	228	200	132	940	614	380	306	222	
	492	426	274	240	160	1128	738	456	368	266	
	532	462	296	260	172	1224	800	490	400	288	
	614	532	342	300	200	1412	922	570	462	332	
	696	604	388	340	226	1600	1046	648	522	378	
	882	764	490	430	286	2024	1322	818	662	478	
	1190	1030	662	580	386	2728	1724	1104	892	644	
1612	1398	698	786	524	3700	2418	1498	1210	874		

Fluorescent lamps with starter. Twin fitting											
Non corrected						With series correction					LC1 <sup>(1)</sup>
P (W)	2x20	2x40	2x65	2x80	2x110	2x20	2x40	2x65	2x80	2x110	
IB (A)	2x0.22	2x0.41	2x0.67	2x0.82	2x1.1	2x0.13	2x0.24	2x0.39	2x0.48	2x0.65	
Max. no. of lamps according to P (W)	2x21	2x11	2x7	2x5	2x4	2x36	2x20	2x12	2x10	2x7	K09
	2x36	2x18	2x10	2x8	2x6	2x60	2x32	2x20	2x16	2x12	D09, D12
	2x46	2x24	2x14	2x12	2x8	2x80	2x42	2x26	2x20	2x16	D18
	2x58	2x30	2x18	2x14	2x10	2x100	2x54	2x32	2x26	2x20	D25
	2x78	2x42	2x26	2x20	2x14	2x134	2x72	2x44	2x36	2x26	D32, D38
	2x100	2x52	2x32	2x26	2x18	2x168	2x90	2x56	2x44	2x32	D40A
	2x126	2x68	2x40	2x34	2x24	2x214	2x116	2x70	2x58	2x42	D50A, D65A, D80A
	2x180	2x96	2x58	2x48	2x36	2x306	2x166	2x102	2x82	2x60	D80, D95
	2x360	2x194	2x118	2x96	2x72	2x614	2x332	2x204	2x166	2x122	D115, D150
	2x436	2x234	2x142	2x116	2x86	2x738	2x400	2x246	2x200	2x148	F185
	2x472	2x254	2x154	2x126	2x94	2x800	2x432	2x266	2x216	2x160	F225
	2x544	2x292	2x178	2x146	2x108	2x922	2x500	2x308	2x250	2x184	F265
	2x618	2x332	2x202	2x166	2x124	2x1046	2x566	2x348	2x282	2x208	F330
	2x782	2x420	2x256	2x210	2x156	2x1322	2x716	2x440	2x358	2x264	F400
	2x1054	2x566	2x346	2x282	2x210	2x1784	2x966	2x594	2x482	2x356	F500
	2x1430	2x766	2x468	2x384	2x286	2x2418	2x1310	2x806	2x654	2x484	F630, F800

<sup>(1)</sup> Validation tests have not been carried out with TeSys D Green contactors.





#### Usual values

The tables show the following values:

- IB: value of current drawn by each lamp at its rated voltage
- C: unit capacitance for each lamp corresponding to the values normally quoted by lamp manufacturers.

These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

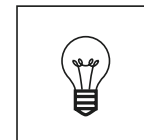
Fluorescent lamps without starter. Single fitting												
	Non corrected					With parallel correction						
	P (W)	20	40	65	80	110	20	40	65	80		110
	IB (A)	0.43	0.55	0.80	0.95	1.4	0.19	0.29	0.46	0.57		0.79
	C (μF)	—	—	—	—	—	5	5	7	7	16	LC1 <sup>(1)</sup>
Max. no. of lamps according to P (W)	22	17	12	10	6		50	33	20	16	—	K09
	37	29	20	16	11		84	55	34	28	20	D09, D12
	48	38	26	22	15		110	72	45	36	26	D18
	60	47	32	27	18		136	89	56	45	32	D25
	97	63	43	36	25		184	101	76	61	44	D32, D38
	102	80	55	46	31		231	151	95	77	55	D40A
	130	101	70	58	40		294	193	121	98	70	D50A, D65A, D80A
	186	145	100	84	57		421	275	173	140	101	D80, D95
	372	290	200	168	114		842	550	346	280	202	D115, D150
	446	348	240	202	136		1010	662	416	336	242	F185
	484	378	260	218	148		1094	716	452	364	262	F225
	558	436	300	252	170		1262	828	522	420	304	F265
	632	494	340	286	194		1432	938	590	476	344	F330
	800	624	430	362	246		1810	1186	748	604	434	F400
	1078	844	580	488	330		2442	1600	1008	814	586	F500
	1462	1144	786	662	448		3310	2168	1366	1104	796	F630, F800
Fluorescent lamps without starter. Twin fitting												
	Non corrected					With series correction						
	P (W)	2x20	2x40	2x65	2x80	2x110	2x20	2x40	2x65	2x80		2x110
	IB (A)	2x0.25	2x0.47	2x0.76	2x0.93	2x1.3	2x0.14	2x0.26	2x0.43	2x0.53		2x0.72
Max. no. of lamps according to P (W)	2x19	2x10	2x6	2x5	2x3		2x34	2x18	2x11	2x9	2x6	K09
	2x32	2x16	2x10	2x8	2x6		2x56	2x30	2x18	2x14	2x10	D09, D12
	2x42	2x22	2x12	2x10	2x8		2x74	2x40	2x24	2x18	2x14	D18
	2x52	2x26	2x16	2x12	2x10		2x92	2x50	2x30	2x24	2x18	D25
	2x70	2x36	2x22	2x18	2x12		2x124	2x66	2x40	2x32	2x24	D32, D38
	2x88	2x46	2x28	2x22	2x16		2x156	2x84	2x50	2x40	2x30	D40A
	2x112	2x58	2x36	2x30	2x20		2x200	2x106	2x64	2x52	2x38	D50A, D65A, D80A
	2x160	2x84	2x52	2x42	2x30		2x234	2x152	2x92	2x74	2x54	D80, D95
	2x320	2x170	2x104	2x86	2x60		2x570	2x306	2x186	2x150	2x110	D115, D150
	2x384	2x204	2x126	2x102	2x74		2x686	2x368	2x222	2x180	2x132	F185
	2x416	2x220	2x136	2x112	2x80		2x742	2x400	2x242	2x196	2x144	F225
	2x480	2x254	2x158	2x128	2x92		2x856	2x462	2x278	2x226	2x166	F265
	2x544	2x288	2x178	2x146	2x104		2x970	2x522	2x316	2x256	2x188	F330
	2x688	2x366	2x226	2x184	2x132		2x1228	2x662	2x400	2x324	2x238	F400
	2x928	2x494	2x304	2x248	2x178		2x1656	2x892	2x540	2x438	2x322	F500
	2x1258	2x668	2x414	2x338	2x242		2x2246	2x1210	2x730	2x592	2x436	F630, F800

<sup>(1)</sup> Validation tests have not been carried out with TeSys D Green contactors.









#### Usual values

The tables show the following values:

■ IB: value of current drawn by each lamp at its rated voltage

■ C: unit capacitance for each lamp

corresponding to the values normally quoted by lamp manufacturers.

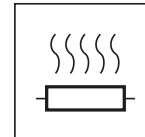
These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

High pressure mercury vapour lamps																
Max. no. of lamps according to P (W)	Non corrected							With parallel correction							LC1 <sup>(1)</sup>	
	P (W)	50	80	125	250	400	700	1000	50	80	125	250	400	700		1000
	IB (A)	0.54	0.81	1.20	2.30	4.10	6.80	9.90	0.3	0.45	0.67	1.3	2.3	3.8		5.5
	C (µF)	—	—	—	—	—	—	—	10	10	10	18	25	40		60
	14	9	6	3	1	—	—	—	—	—	—	—	—	—	—	K09
	22	14	9	5	2	1	1	40	26	17	9	—	—	—	—	D09, D12
	27	18	12	6	3	2	1	50	33	22	11	6	—	—	—	D18
	35	23	15	8	4	2	1	63	42	28	14	8	5	3		D25
	48	32	21	11	6	3	2	86	57	38	20	11	6	4		D32, D38
	61	40	27	14	8	4	3	110	73	49	25	14	8	6		D40A
	77	51	34	17	10	6	4	140	93	62	32	18	11	7		D50A, D65A, D80A
	111	74	49	26	14	8	6	200	133	89	46	26	15	10		D80, D95
	222	148	100	52	28	16	12	400	266	178	92	52	30	20		D115, D150
	310	206	140	72	40	24	17	560	372	250	128	72	44	30		F185
	336	224	152	78	44	26	18	606	404	272	140	78	48	32		F225
	388	258	174	90	50	30	20	700	466	312	162	90	54	38		F265
	440	294	198	102	58	34	24	792	528	354	182	102	62	42		F330
	556	372	250	130	72	44	30	1002	668	448	232	130	78	54		F400
	752	500	338	176	98	60	40	1352	902	606	312	176	106	74		F500
	1102	734	496	258	144	88	60	1982	1322	888	458	258	156	108		F630, F800

Metal iodine vapour lamps															
Max. no. of lamps according to P (W)	Non corrected				With parallel correction				LC1 <sup>(1)</sup>						
	P (W)	250	400	1000	2000	250	400	1000		2000					
	IB (A)	2.5	3.6	9.5	20	1.4	2	5.3		11.2					
	C (µF)	—	—	—	—	32	32	64		140					
	3	2	—	—	—	—	—	—	—	K09					
	4	3	1	—	—	—	—	—	—	D09, D12					
	6	4	1	—	—	—	—	—	—	D18					
	7	5	2	—	13	9	—	—	—	D25					
	10	7	2	1	18	13	4	—	—	D32, D38					
	13	9	3	1	23	16	6	—	—	D40A					
	16	11	4	2	30	21	7	—	—	D50A, D65A, D80A					
	24	16	6	3	42	30	11	5		D80, D95					
	48	32	12	6	84	60	22	10		D115, D150					
	66	46	18	8	120	84	32	14		F185					
	72	50	20	10	130	90	34	16		F225					
	84	58	22	12	150	104	40	18		F265					
	94	66	24	14	170	118	44	20		F330					
	120	84	32	16	214	150	56	26		F400					
	162	112	42	20	290	202	76	36		F500					
	238	164	62	30	424	298	112	52		F630, F800					

<sup>(1)</sup> Validation tests have not been carried out with TeSys D Green contactors.





## Selection

### General

A heating circuit is a power switching circuit supplying one or more resistive heating elements switched by a contactor. The same general rules apply as for motor circuits, except that heating circuits are not normally subjected to overload currents. It is therefore only necessary to provide short-circuit protection.

### Characteristics of heating elements

The examples below are based on resistive heating elements used for industrial furnaces or for the heating of buildings (infra-red or resistive radiant type, convactor heaters, closed loop heating circuits, etc.). The variation in resistance values between hot and cold states causes a current peak at switch-on which never exceeds 2 to 3 times the rated operational current ( $I_n$ ). This initial peak does not recur during normal operation where subsequent switching is thermostatically controlled. The rated power and current of a heater are given for the normal operating temperature.

### Protection

The steady state current drawn by a heating circuit is constant when the voltage is stable. In fact:

- it is unlikely that the number of loads in an existing circuit will be modified
- this type of circuit cannot create overloads. It is therefore only necessary to provide short-circuit protection.

This can be provided by:

- gG type fuses, or
- modular circuit breakers.

Nevertheless, it is always possible and sometimes more economical (smaller cable size) to protect the circuit by a thermal overload relay and associated aM type fuses.

### Switching, control, protection

A heating element or group of heating elements of a given power may be either single-phase or 3-phase and may be supplied from a 220/127 V or a 400/230 V distribution system. Excluding a single-phase 127 V system (which is no longer commonly used), the following 3 types of circuit arrangement are possible:

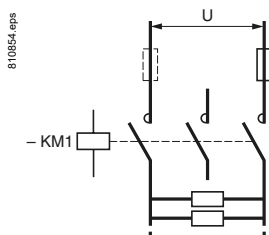
- single-phase, 2-pole switching
- single-phase, 4-pole switching
- 3-phase switching

## Component selection according to the power switched

The combinations suggested below are based on an ambient temperature of 55 °C and for powers at the nominal voltage, but they also ensure switching in the event of prolonged overloads up to 1.05  $U_e$ .

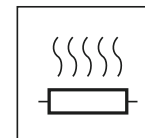
### Single-phase, 2-pole switching

Maximum power (kW)				Contactor rating
220/240 V	380/415 V	660/690 V	1000 V	
3.5	6.5	11	–	LC1, LP1K09
4.5	8	14	–	LC1D12
6	10.5	18.5	–	LC1D18
7	13	22.5	–	LC1D25
10	18	30.5	–	LC1D32, LC1D38
13	22.5	39.5	–	LC1D40A
16.5	28.5	43.5	–	LC1D65A, LC1D80A
24	42	73	82.5	LC1, LP1D80
44	76	118	157	LC1D115, LC1D150
48	83	130	–	LC1F185
52	90	145	–	LC1F225
60	104	160	210	LC1F265
75	130	200	250	LC1F330
86	145	230	300	LC1F4002
116	200	310	400	LC1F5002
170	290	450	695	LC1F6302, LC1F800
270	460	715	945	LC1F780
140	242	370	490	LC1BL32
220	380	580	770	LC1BM32
350	605	925	1225	LC1BP32
480	830	1270	1680	LC1BR32

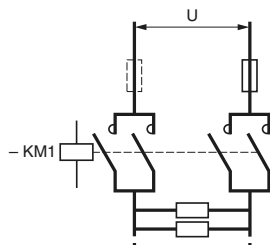


Circuit controlled by 2 poles of the contactor.



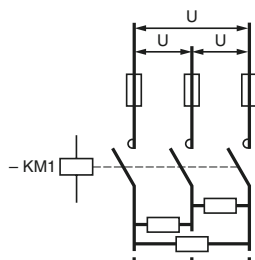


810856 eps



Circuit controlled by a 4-pole contactor with the poles parallel connected in pairs using appropriate connecting links.  
This solution enables the control of power values approximately equivalent to those controlled by the same contactor on 3-phase.

810857 eps



Circuit controlled by 3 poles of the contactor.

#### Component selection according to the power switched

##### Single-phase, 4-pole switching

Maximum power (kW)				Contactor rating
220/240 V	380/415 V	660/690 V	1000 V	
4.5	8	13.5	–	LC1, LP1K09004
7	13	22.5	–	LC1DT25
12	21	36.5	–	LC1DT40
26	45.5	79.5	–	LC1DT80A
38	66	117.5	132	LC1, LP1D80004
70	121	190	251	LC1D115004
76	132	202	–	LC1F1854
80	142	230	–	LC1F2254
96	166	253	335	LC1F2654
120	205	320	400	LC1F3304
137	236	363	480	LC1F4004
185	320	490	650	LC1F5004
272	470	718	950	LC1F6304
425	735	1140	1520	LC1F7804
224	387	590	785	LC1BL34
352	608	930	1230	LC1BM34
560	968	1478	1960	LC1BP34
768	1328	2025	2685	LC1BR34

##### 3-phase switching

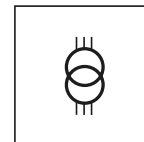
Maximum power (kW)				Contactor rating
220/240 V	380/415 V	660/690 V	1000 V	
4.5	8	13.5	–	LC1, LP1K09
7	13	22.5	–	LC1D12
10	18	30.5	–	LC1D18
13	22.5	39.5	–	LC1D25
18	31	52.5	–	LC1D32, LC1D38
22.5	38	68	–	LC1D40A
28.5	49	86	–	LC1D65A, LC1D80A
40.5	70.5	126	135.5	LC1, LP1D80
83	140	235	345	LC1D115, LC1D150
100	170	280	–	LC1F185
110	185	300	–	LC1F225
125	220	370	540	LC1F265
160	260	400	640	LC1F330
180	310	530	760	LC1F400
255	445	740	950	LC1F500
370	630	1000	1500	LC1F630, LC1F800
570	1000	1650	2400	LC1F780
242	419	640	850	LC1BL33
380	658	1005	1350	LC1BM33
606	1047	1600	2150	LC1BP33
830	1437	2200	2950	LC1BR33

#### Application example

For a 220 V, 50 Hz, single-phase circuit supplying a total heating load of 12.5 kW. Select a 3-pole contactor **LC1D65A**.

(1) See complete contactor references on pages B8/8 to B8/13 or consult your Regional Sales Office.





## Operating conditions

Maximum ambient temperature: 55 °C.

When a transformer is switched on, there is generally an initial current surge which reaches its peak value almost instantaneously and then decreases in a largely exponential manner to quickly reach its steady state value.

The value of this current depends on:

- the characteristics of the magnetic circuit and of the windings (cross sectional area of the core, rated inductance, number of turns, layout and size of the windings, ...)
- the performance of the magnetic laminations used
- the magnetic state of the circuit and the instantaneous value of the a.c. mains voltage at the moment of switch-on.

The inrush current at the moment of switch-on can reach 20 to 40 times the rated current for the various kVA power ratings in the tables below. This value is independent of the "no-load" or "on-load" state of the transformer.

## Contactor selection

The peak magnetising current of the transformer must be lower than the values given in the tables below.

Maximum operating rate: 120 operating cycles/hour.

Contactor rating <sup>(1)</sup>			LC1/ LP1 K06	LC1/ LP1 K09	LC1 D09	LC1 D12	LC1 D18	LC1 D25	LC1 D32	LC1 D38	LC1 D40A	LC1 D50A	LC1 D65A D80A	LC1 D80	LC1 D95	LC1 D115	LC1 D150
Maximum permissible current peak at switch-on	A		160	225	350	350	420	630	770	770	1100	1250	1400	1550	1650	1800	2000
Maximum operational power <sup>(2)</sup>	220 V	kVA	2	2.5	4	4	5	7	8.5	8.5	14	16	18	19.5	19.5	25	25
	240 V																
	380 V	kVA	3.5	5	7	7	8	12.5	15	15	24	27	31	34	34	50	50
	400 V																
	415 V	kVA	4	5.5	8	8	9	14	17	17	28	32	36	39	39	55	55
	440 V																
	500 V	kVA	5	7	9	9	11	16.5	20	20	32	36	40	45	45	65	65
	660 V	kVA	6	8.5	12	12	14	21.5	26.5	26.5	42	48	53	59	59	80	80
	690 V																
	1000 V	kVA	–	–	–	–	–	–	–	–	–	–	–	85	95	100	100

Contactor rating <sup>(1)</sup>			LC1 F185	LC1 F225	LC1 F265	LC1 F330	LP1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 F800	LC1 BL	LC1 BM	LC1 BP	LC1 BR
Maximum permissible current peak at switch-on	A		2900	3300	3800	5000	6300	7700	9000	12 000	11 000	18 000	18 000	24 000	30 000
Maximum operational power <sup>(2)</sup>	220 V	kVA	40	45	50	65	75	100	120	175	145	230	230	300	380
	240 V														
	380 V	kVA	75	80	90	120	130	170	200	280	245	400	400	530	660
	400 V														
	415 V	kVA	80	90	100	130	140	190	220	310	270	450	450	560	700
	440 V														
	500 V	kVA	95	100	110	140	170	225	260	350	315	480	480	600	750
	660 V	kVA	120	130	140	170	200	270	350	400	425	600	600	800	950
	690 V														
	1000 V	kVA	–	–	–	225	250	–	470	650	550	700	700	1000	1200

<sup>(1)</sup> TeSys D Green contactors have not been validated for switching the primaries of 3-phase LV/LV transformers.

<sup>(2)</sup> Maximum operational power corresponding to a current peak at switch-on of 30 I<sub>n</sub>.





## Standard contactors

Capacitors, together with the circuits to which they are connected, form oscillatory circuits which can, at the moment of switch-on, give rise to high transient currents (> 180 In) at high frequencies (1 to 15 kHz).

As a general rule, the peak current on energisation is lower when:

- the mains inductances are high
- the line transformer ratings are low
- the transformer short-circuit voltage is high
- the ratio between the sum of the ratings of the capacitors already switched into the circuit and that of the capacitor to be switched in is small (for multiple step capacitor banks).

In accordance with standards IEC 60070, NF C 54-100, VDE 0560, the switching contactor must be able to withstand a continuous current of 1.43 times the rated current of the capacitor bank step being switched.

The rated operational powers given in the tables below take this overload into account. Short-circuit protection is normally provided by gI type HPC fuses rated at 1.7 to 2 In.

## Contactor applications

### Operating conditions

Capacitors are directly switched. **The values of peak current at switch-on must not exceed the values indicated opposite.**

An inductor may be inserted in each of the three phases supplying the capacitors to reduce the peak current, if necessary.

Inductance values are determined according to the selected operating temperature.

### Power factor correction by a single-step capacitor bank

The use of a choke inductor is unnecessary: the inductance of the mains supply is adequate to limit the peak to a value compatible with the contactor characteristics.

### Power factor correction by a multiple-step capacitor bank

Select a special contactor as defined on page B8/20.

**If a standard contactor is used, it is essential to insert a choke inductor in each of the three phases of each step.**

## Maximum operational power of contactors

### Standard contactors

Maximum operating rate: 120 operating cycles/hour.

Electrical durability at maximum load: 100 000 operating cycles.

With choke inductors connected, where necessary.

Operational power at 50/60 Hz						Max. peak current	Contactor rating <sup>(1)</sup>
θ ≤ 40 °C <sup>(2)</sup>			θ ≤ 55 °C <sup>(2)</sup>				
220/240 V	400/440 V	600/690 V	220/240 V	400/440 V	600/690 V		
kvAR	kvAR	kvAR	kvAR	kvAR	kvAR	A	
6	11	15	6	11	15	560	LC1D09, D12
9	15	20	9	15	20	850	LC1D18
11	20	25	11	20	25	1600	LC1D25
14	25	30	14	25	30	1900	LC1D32, D38
17	30	37	17	30	37	2160	LC1D40
22	40	50	22	40	50	2160	LC1D50
22	40	50	22	40	50	3040	LC1D65
35	60	75	35	60	75	3040	LC1D80, D95
50	90	125	38	75	80	3100	LC1D115
60	110	135	40	85	90	3300	LC1D150
70	125	160	50	100	100	3500	LC1F185
80	140	190	60	110	110	4000	LC1F225
90	160	225	75	125	125	5000	LC1F265
100	190	275	85	140	165	6500	LC1F330
125	220	300	100	160	200	8000	LC1F400
180	300	400	125	220	300	10 000	LC1F500
250	400	600	190	350	500	12 000	LC1F630
250	400	600	190	350	500	14 200	LC1F800
200	350	500	180	350	500	25 000	LC1BL
300	550	650	250	500	600	25 000	LC1BM
500	850	950	400	750	750	25 000	LC1BP
600	1100	1300	500	1000	1000	25 000	LC1BR

<sup>(1)</sup> TeSys D Green contactors have not been validated for switching the primaries of 3-phase LV/LV transformers.

<sup>(2)</sup> Upper limit of temperature category conforming to IEC 60070.

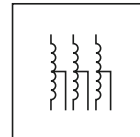


# TeSys contactors <sup>(1)</sup>

For auto-transformer starting

Recommended wiring scheme, operation, curves

Coordination and standards



## Applications

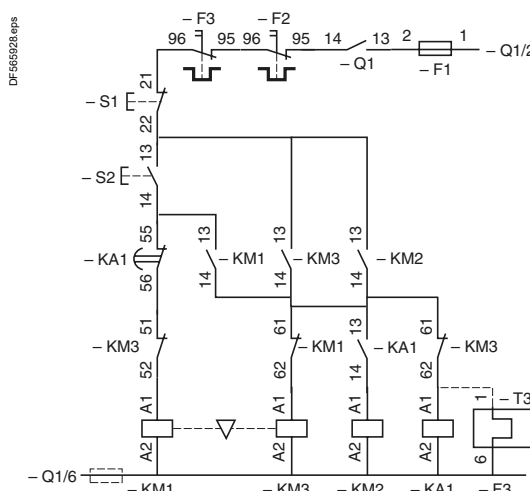
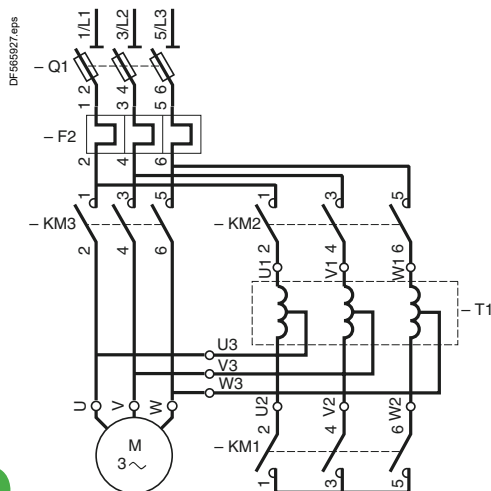
Auto-transformer starting is suitable for starting all types of squirrel cage motors: with 3, 6 or even 9 terminals according to North American technology. Starting is performed at reduced voltage and produces maximum torque at minimum line current.

It allows the starting torque ( $C = f(U)^2$ ) to be adapted to the resistive torque of the driven machine by means of the 2 or 3 intermediate voltage take-off connections on the auto-transformer (0.65 and 0.8  $U_n$  or 0.5, 0.65 and 0.8  $U_n$ ). In general, only one take-off connection is used.

This type of starting is used for high power and/or high inertia machines.

The motor is never disconnected from its power supply during starting (closed transition) and transient phenomena are eliminated.

## Recommended wiring scheme



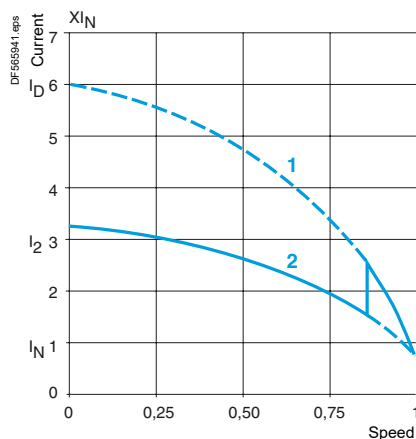
## Operation

Starting is performed in 3 stages:

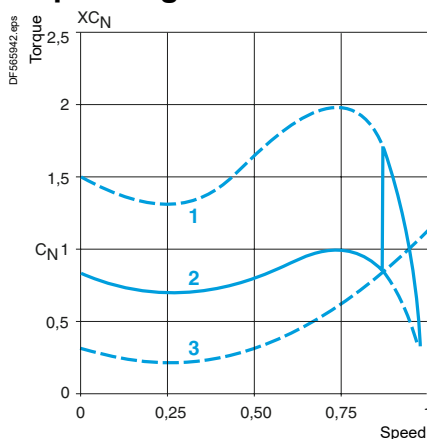
- star connection of the auto-transformer is made by KM1, then contactor KM2 closes and the motor starts under reduced voltage
- the neutral point is opened by KM1; part of the auto-transformer winding is switched into each phase for a short moment, constituting a stator starting inductance
- KM3 switches the motor to full mains voltage and causes the auto-transformer to be shunted out of circuit by KM2.

The auto-transformer used generally has an air gap (adjusted or not) in order to obtain, during the second phase of starting, a series inductance whose value is compatible with correct starting.

## Operating curves



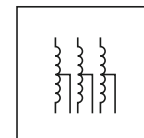
- 1 Direct switching current
- 2 Current with auto-transformer



- 1 Direct motor torque
- 2 Torque with auto-transformer
- 3 Resistive torque of the machine

<sup>(1)</sup> TeSys D Green contactors have not been validated for auto-transformer starting.





## Auto-transformer starters from 59 to 900 kW up to 440 V (type 1 coordination)

The components recommended in the table below have been determined according to the following characteristics:

- auto-transformer: on 0.65 Un connection with non adjusted air gap
- 3 starts per hour, of which 2 consecutive
- motor starting current:  $I_d/I_n = 6$
- $I_q = 70$  kA
- transient current on closing of KM3  $\leq 7 \sqrt{2} I_n$
- maximum starting time: 30 seconds
- ambient temperature  $\theta \leq 40$  °C.

Switch-disconnector-fuses: operators and accessories, please consult your Regional Sales Office.

Contactors: 3-pole.

LC1D: see pages B8/8 and B8/13,

LC1F: please consult your Regional Sales Office,

LC1B: please consult your Regional Sales Office.

Auxiliary contact blocks:

- for contactors LC1D: one LADN11 (1 N/O + 1 N/C) on KM1
- for contactors LC1F: one LADN22 (2 N/O + 2 N/C) on KM1, KM2 and KM3.

Thermal overload relays:

- LR: see pages B11/4 to B11/9
- LR9D: see pages B11/5 to B11/9
- LR9F: please consult your Regional Sales Office.

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3					Switch-disconnector-fuse Reference	aM fuses		Contactors <sup>(1)</sup>			Overload relays	
220/230 V	380/400 V	415 V	440 V	In max		Size	Rating	KM3 LC1	KM2 LC1	KM1 LC1	Reference <sup>(2)</sup>	Setting range
kW	kW	kW	kW	A			A					A
30	55	59	59	105	GS•K	22 x 58	125	D115	D115	D3210	LR9D5369	90...150
											LRD4367	95...120
40	75	80	80	138	GS•L	T0	160	D150	D115	D5011	LR9D5369	90...150
											LRD4369	110...140
51	90	90	100	170	GS•N	T1	200	F185	D115	D5011	LR9F5371	132...220
63	110	110	110	205	GS•N	T1	250	F225	D150	D8011	LR9F5371	132...220
75	132	132	150	245	GS•N	T1	250	F265	F185	D115	LR9F7375	200...330
90	160	160	185	300	GS•QQ	T2	315	F330	F265	D115	LR9F7375	200...330
110	200	200	220	370	GS•QQ	T2	400	F400	F330	D115	LR9F7379	300...500
140	250	257	280	460	GS2S	T3	500	F500	F400	D115	LR9F7379	300...500
180	315	355	375	584	GS2S	T3	630	F630	F400	D185	LR9F7381	380...630
200	355	375	400	635	GS2V	T4	800	F800	F500	F185	TC800/1 + LRD05	505...800
220	400	425	450	710	GS2V	T4	800	F800	F500	F265	TC800/1 + LRD05	505...800
250	450	475	500	800	GS2V	T4	800	F800	F500	F265	TC1000/1 + LRD05	630...1000
280	500	530	560	900	GS2V	T4	1000	BM33•22	F630	F330	TC1000/1 LRD05	630...1000
315	560	600	630	1000	GS2V	T4	1000	BM33•22	F630	F400	TC1250/1 LRD05	790...1250
335	630	670	710	1100	GS2V	T4	1250	BP33•22	F630	F400	TC1250/1 LRD05	790...1250
400	710	750	800	1260	On base	T4	2 x 800 <sup>(3)</sup>	BP33•22	F780	F400	TC1500/1 LRD05	945...1500
450	800	800	800	1450	On base	T4	2 x 800 <sup>(3)</sup>	BP33•22	F780	F400	TC1750/1 LRD05	100...1750
500	900	900	900	1600	On base	T4	2 x 800 <sup>(3)</sup>	BR33•22	F780	F500	TC2000/1 LRD05	260...2000

<sup>(1)</sup> TeSys D Green contactors have not been validated for auto-transformer starting.

<sup>(2)</sup> For power ratings greater than or equal to 400 kW at 415 V, use one LRD-05 on the current transformer.

<sup>(3)</sup> Check with the motor manufacturer whether the fuses should be fitted in parallel.



# TeSys contactors <sup>(1)</sup>

For rotor circuits of slip-ring motors

## Operation - Coordination and standards

### Applications

These contactors are used to eliminate starting resistance in the rotor circuit of slip-ring motors.

The most common application is for starters without inching and without rotor speed adjustment: pumps, fans, conveyors, compressors, ...

In the case of control by means of a manually operated master controller, the use of contactors with magnetic blow-out is recommended. Please consult your Regional Sales Office.

For hoisting applications, contactor selection must take into account the type of motor duty, the operating rate, the rotor voltage and current, the type of connection, the ambient temperature, etc.  
Please consult your Regional Sales Office.

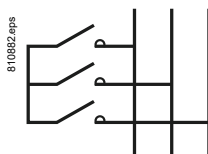
### Operation

The rotor circuit contactors are interlocked with the stator contactor and therefore do not open until after the stator contactor has opened, when the rotor voltage has disappeared, or virtually disappeared.

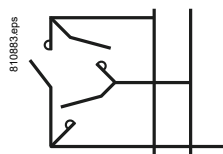
They make the current corresponding to the normal starting peak (1.5 to 2.5 times the rated rotor current) and open the circuit under no-load. Making and breaking are easy.

#### Different types of rotor connection

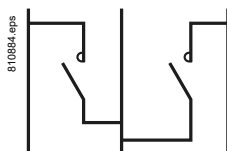
##### Star connection



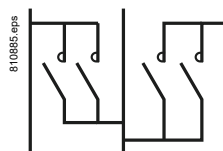
##### Delta connection



##### 'V' connection



##### 'W' connection



<sup>(1)</sup> TeSys D Green contactors have not been validated for rotor circuits of slip-ring motors.



## Contactor selection according to the type of connection

### Rotor current and voltage coefficients

Coefficients to be applied to the operational current values shown in the table below.

Type of connection	Rotor I coefficient	3-phase rotor U <sub>e</sub> <sup>(2)</sup>			
		Maximum	With counter-current		
	Operational I	LC1 F	LC1B	LC1 F	LC1B
Star	1	2000 V	2000 V	1000 V	1000 V
Delta	1.4	1700 V	1700 V	850 V	850 V
In V	1	1700 V	1700 V	850 V	850 V
In W	1.6	1700 V	1700 V	850 V	850 V

## Selection according to the operational current

The selection examples below take into account:

- a ratio of 2 between the maximum operational rotor voltage (U<sub>er</sub>) and the rated stator operational voltage (U<sub>es</sub>). This ratio is given in standard IEC 60947-4,
- a guarantee of occasional duty (making and breaking capacities) specified in the above standards.

Time current flowing	Contactor rating										
	LC1 D150	LC1 F185	LC1 F265	LC1 F400	LC1 F500	LC1 F630	LC1 F780	LC1 BL	LC1 BM	LC1 BP	LC1 BR
<b>Intermediate contactor: with number of operating cycles ≤ 30/h</b>											
10 s	450 A	550 A	800 A	1100 A	1500 A	2000 A	2500 A	2000 A	2400 A	3750 A	5000 A
30 s	280 A	400 A	550 A	730 A	1000 A	1500 A	2000 A	1200 A	1800 A	2600 A	3600 A
60 s	220 A	300 A	400 A	550 A	750 A	1200 A	1500 A	1000 A	1500 A	2200 A	3000 A

<b>Intermediate contactor: with number of operating cycles ≤ 60/h</b>											
5 s	450 A	550 A	800 A	1100 A	1500 A	2000 A	2500 A	2000 A	2400 A	3750 A	5000 A
10 s	330 A	450 A	620 A	860 A	1250 A	1800 A	2300 A	1600 A	2200 A	3400 A	4500 A
30 s	220 A	300 A	400 A	550 A	750 A	1200 A	1500 A	1000 A	1500 A	2200 A	3000 A

<b>Intermediate contactor: with number of operating cycles ≤ 150/h for LC1F and 120/h for LC1B</b>											
5 s	300 A	420 A	580 A	820 A	1150 A	1650 A	2200 A	1500 A	2100 A	3200 A	4200 A
10 s	250 A	350 A	430 A	600 A	850 A	1300 A	1600 A	1100 A	1600 A	2300 A	3200 A

<b>Rotor short-circuit contactor and intermediate contactor: with number of operating cycles &gt; 150/h for LC1F and 120/h for LC1B</b>											
–	200 A	270 A	350 A	500 A	700 A	1000 A	1600 A	800 A	1250 A	2000 A	2750 A

### Electrical durability

For automatic starting, the electrical durability is in the region of 1 million operating cycles.

(1) TeSys D Green contactors have not been validated for rotor circuits of slip-ring motors.

(2) For use up to 3000 V, please consult your Regional Sales Office.



## Voltage drop caused by the inrush current

When the operating coil of a contactor is energised, the inrush current produces a voltage drop in the control circuit cable caused by the resistance of the conductors, which can adversely affect closing of the contactor.

An excessive voltage drop in the control supply cables (both a.c. and d.c.) can lead to non closure of the contactor poles or even destruction of the coil due to overheating.

This phenomenon is aggravated by:

- a long line
- a low control circuit voltage
- a cable with a small c.s.a.
- a high inrush power drawn by the coil.

The maximum length of cable, depending on the control voltage, the inrush power and the conductor c.s.a., is indicated in the graphs below.

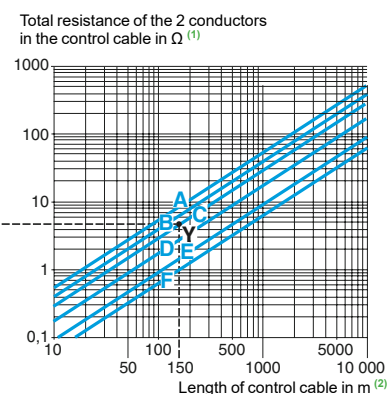
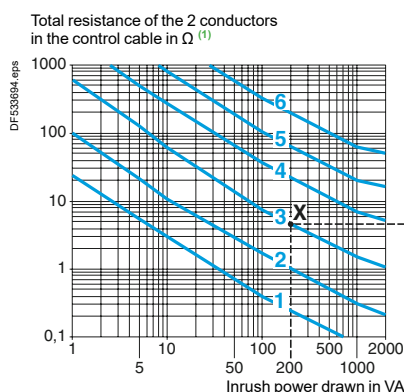
## Remedial action

To reduce the voltage drop at switch-on:

- increase the conductor c.s.a.
- use a higher control circuit voltage
- use an intermediate control relay.

## Selection of conductor c.s.a.

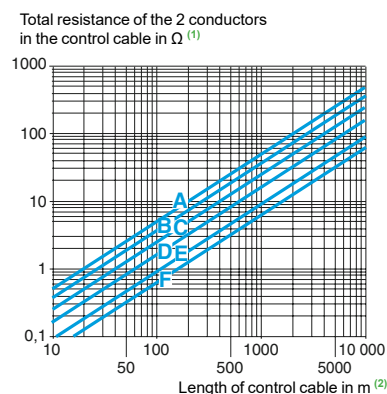
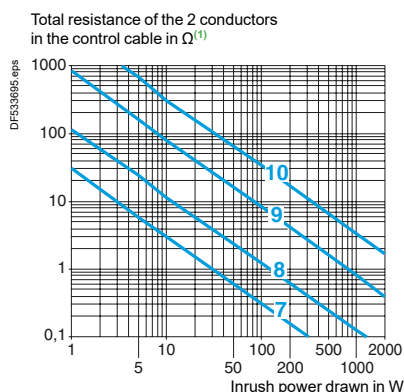
These graphs are for a maximum line voltage drop of 5 %. They give a direct indication of the copper conductor c.s.a. to be used for the control cable, depending on its length, the inrush power drawn by the contactor coil and the control circuit voltage (see example page A6/65).



1 ~ 24 V    3 ~ 115 V    5 ~ 400 V

### C.s.a. of copper cables

A 0.75 mm<sup>2</sup>    C 1.5 mm<sup>2</sup>    E 4 mm<sup>2</sup>



2 ~ 48 V    4 ~ 230 V    6 ~ 690 V

B 1 mm<sup>2</sup>    D 2.5 mm<sup>2</sup>    F 6 mm<sup>2</sup>

7 ~ 24 V    9 ~ 125 V

8 ~ 48 V    10 ~ 250 V

### C.s.a. of copper cables

A 0.75 mm<sup>2</sup>    C 1.5 mm<sup>2</sup>    E 4 mm<sup>2</sup>

B 1 mm<sup>2</sup>    D 2.5 mm<sup>2</sup>    F 6 mm<sup>2</sup>

<sup>(1)</sup> For 3-wire control, the current only flows in 2 of the conductors.

<sup>(2)</sup> This is the length of the cable comprising 2 or 3 conductors. (Distance between the contactor and the control device).



## Voltage drop caused by the inrush current

What cable c.s.a. is required for the control circuit of an LC1 D40A, 115 V contactor, operated from a distance of 150 metres?

■ Contactor LC1D40A, voltage 115 V, 50 Hz: inrush power: 200 VA.

On the left-hand graph on the page opposite, point X is at the intersection of the vertical line corresponding to 200 VA and the ~ 115 V voltage curve.

On the right-hand graph on the page opposite, point Y is at the intersection of the vertical line corresponding to 150 m and the horizontal line passing through point X.

Use the conductor c.s.a. indicated by the curve which passes through point Y, i.e.: 1.5 mm<sup>2</sup>.

If point Y lies between two c.s.a. curves, choose the larger of the c.s.a. values.

## Calculating the maximum cable length

The maximum permissible length for acceptable line voltage drop is calculated by the formula:

$$L = \frac{U^2}{SA} \cdot s \cdot K$$

where:

L : distance between the contactor and the control device in m  
(length of the cable)

U : supply voltage in V

SA : apparent inrush power drawn by the coil in VA

s : conductor c.s.a. in mm<sup>2</sup>

K : factor given in the table below.

a.c. supply	SA in VA	20	40	100	150	200
	K	1.38	1.5	1.8	2	2.15
d.c. supply	Irrespective of the apparent inrush power SA, expressed in W K = 1.38					



#### Residual current in the coil due to cable capacitance

When the control contact of a contactor is opened, the control cable capacitance is effectively in series with the coil of the electromagnet. This capacitance can cause a residual current to be maintained in the coil, with the risk that the contactor will remain closed.

#### This only applies to contactors operating on an a.c. supply.

This phenomenon is aggravated by:

- a long line length between the coil control contact and the contactor, or between the coil control contact and the power supply,
- a high control circuit voltage,
- a low coil consumption, sealed,
- a low value of contactor drop-out voltage.

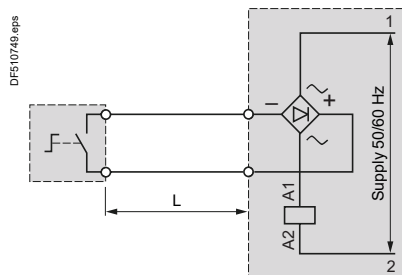
The maximum control cable length, according to the contactor coil supply voltage, is indicated in the graph on the page opposite.

#### Remedial action

Various solutions can be adopted to avoid the risk of the contactor remaining closed due to cable capacitance:

- use a d.c. control voltage, or
- add a rectifier, connected as shown in the scheme below, but retaining an a.c. operating coil: in this way, rectified a.c. current flows in the control cable.

When calculating the maximum cable length, take the resistance of the conductors into account.



- Connect a resistor in parallel with the contactor coil <sup>(1)</sup>.

Value of the resistance:

$$R \Omega = \frac{1}{10^{-3} C (\mu F)} \quad (C \text{ capacitance of the control cable})$$

Power to be dissipated:

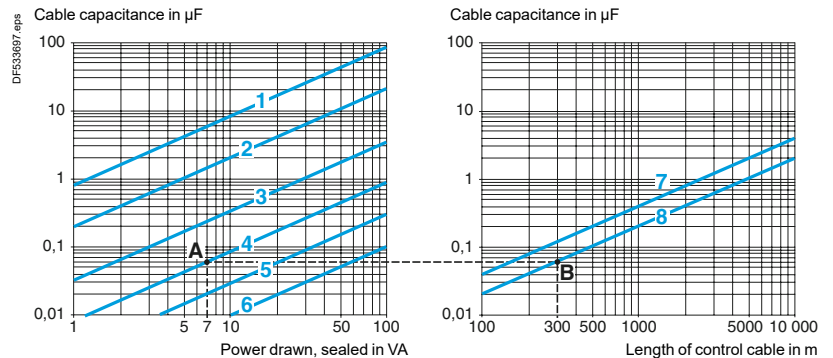
$$PW = \frac{U^2}{R}$$

<sup>(1)</sup> To avoid increasing the voltage drop due to inrush current, this resistor must be brought into operation after the contactor has closed by using an N/O contact.



## Residual current in the coil due to cable capacitance

These graphs are for a capacitance, between 2 conductors, of 0.2 µF/km. They make it possible to determine whether there is a risk of the contactor remaining closed due to the power drawn by the coil when sealed, as well as the control circuit voltage, according to the length of the control cable.



1 ~ 24 V	3 ~ 115 V	5 ~ 400 V	7 3-wire control
2 ~ 48 V	4 ~ 230 V	6 ~ 690 V	8 2-wire control

In the zones below the straight lines for 3-wire and 2-wire control respectively, there is a risk of the contactor remaining closed.

### Examples

What is the maximum length for the control cable of an LC1D12 contactor, operating on 230 V, with 2-wire control?

■ Contactor LC1D12, voltage 230 V, 50 Hz: power sealed 7 VA.

On the left-hand graph, point A is at the intersection of the vertical line for 7 VA with the ~ 230 V voltage curve.

On the right-hand graph, point B is at the intersection of the horizontal line with the 2-wire control curve.

The maximum cable length is therefore 300 m.

In the same example, with a 600 m cable, the point lies in the risk zone. A resistor must therefore be connected in parallel with the contactor coil.

$$R = \frac{1}{10^{-3} \cdot C} = \frac{1}{10^{-3} \cdot 0.12} = 8.3 \, \Omega$$

Value of this resistance:

$$P = \frac{U^2}{R} = \frac{(220)^2}{8300} = 6 \, \text{W}$$

Power to be dissipated:

Alternative solution: use a d.c. control supply.

### Calculating the cable length

The maximum permitted length of control cable to avoid the effects of capacitance is calculated using the formula:

$$L = 455 \cdot \frac{S}{U^2 \cdot C_0}$$

L : distance between the contactor and the control device in km  
(length of the cable),

S : apparent power, sealed, in VA,

U : control voltage in V,

C<sub>0</sub> : line capacitance of the cable in µF/km.



# Technical information

## Current of asynchronous squirrel cage motors at nominal load

### General - Coordination and standards

3-phase 4-pole motors												
Current values for power in kW					Current values for power in hp							
Rated operational power <sup>(1)</sup>	Indicative rated operational current values at:				Rated operational power <sup>(2)</sup>	Indicative rated operational current values at:						
	230 V	400 V	500 V	690 V		110 - 120 V	200 V	208 V	220 - 240 V	380 - 415 V	440 - 480 V	550 - 600 V
kW	A				hp	A						
0.06	0.35	0.2	0.16	0.12	1/2	4.4	2.5	2.4	2.2	1.3	1.1	0.9
0.09	0.52	0.3	0.24	0.17	3/4	6.4	3.7	3.5	3.2	1.8	1.6	1.3
0.12	0.7	0.44	0.32	0.23	1	8.4	4.8	4.6	4.2	2.3	2.1	1.7
0.18	1	0.6	0.48	0.35	1 1/2	12	6.9	6.6	6	3.3	3	2.4
0.25	1.5	0.85	0.68	0.49	2	13.6	7.8	7.5	6.8	4.3	3.4	2.7
0.37	1.9	1.1	0.88	0.64	3	19.2	11	10.6	9.6	6.1	4.8	3.9
0.55	2.6	1.5	1.2	0.87	5	30.4	17.5	16.7	15.2	9.7	7.6	6.1
0.75	3.3	1.9	1.5	1.1	7 1/2	44	25.3	24.2	22	14	11	9
1.1	4.7	2.7	2.2	1.6	10	56	32.2	30.8	28	18	14	11
1.5	6.3	3.6	2.9	2.1	15	84	48.3	46.2	42	27	21	17
2.2	8.5	4.9	3.9	2.8	20	108	62.1	59.4	54	34	27	22
3	11.3	6.5	5.2	3.8	25	136	78.2	74.8	68	44	34	27
4	15	8.5	6.8	4.9	30	160	92	88	80	51	40	32
5.5	20	11.5	9.2	6.7	40	208	120	114	104	66	52	41
7.5	27	15.5	12.4	8.9	50	260	150	143	130	83	65	52
11	38	22	17.6	12.8	60	-	177	169	154	103	77	62
15	51	29	23	17	75	-	221	211	192	128	96	77
18.5	61	35	28	21	100	-	285	273	248	165	124	99
22	72	41	33	24	125	-	359	343	312	208	156	125
30	96	55	44	32	150	-	414	396	360	240	180	144
37	115	66	53	39	200	-	552	528	480	320	240	192
45	140	80	64	47	250	-	-	-	604	403	302	242
55	169	97	78	57	300	-	-	-	722	482	361	289
75	230	132	106	77	350	-	-	-	828	560	414	336
90	278	160	128	93	400	-	-	-	954	636	477	382
110	340	195	156	113	450	-	-	-	1030	-	515	412
132	400	230	184	134	500	-	-	-	1180	786	590	472
160	487	280	224	162								
200	609	350	280	203								
250	748	430	344	250								
315	940	540	432	313								
355	1061	610	488	354								
400	1200	690	552	400								
500	1478	850	680	493								
560	1652	950	760	551								
630	1844	1060	848	615								
710	2070	1190	952	690								
800	2340	1346	1076	780								
900	2640	1518	1214	880								
1000	2910	1673	1339	970								

(1) Values conforming to standard IEC 60072-1 (at 50 Hz).

(2) Values conforming to standard UL 508 (at 60 Hz).

**Note:** These values are given as a guide. They may vary depending on the type of motor, its polarity and the manufacturer.



## Standardisation

### Conformity to standards

Schneider Electric products satisfy, in the majority of cases, national (for example: BS in Great Britain, NF in France, DIN in Germany), European (for example: CENELEC) or international (IEC) standards. These product standards precisely define the performance of the designated products (such as IEC 60947 series for low voltage equipment).

When used correctly, as designated by the manufacturer and in accordance with regulations and correct practices, these products will allow users to build equipment, machine systems or installations that conform to their appropriate standards (for example: IEC 60204-1, relating to electrical equipment used on industrial machines).

Schneider Electric is able to provide proof of conformity of its production to the standards it has chosen to comply with, through its quality assurance system.

On request, and depending on the situation, Schneider Electric can provide the following:

- a declaration of conformity,
- a certificate of conformity (CB certificate, Asefa/Lovag),
- a homologation certificate or approval, in the countries where this procedure is required or for particular specifications, such as those existing in the merchant navy.

Standard	Certification authority		Country
	Name	Regulation authority	
<b>ANSI</b>	American National Standards Institute	ANSI	USA
<b>BS</b>	British Standards Institution	BSI	Great Britain
<b>CEI</b>	Comitato Elettrotecnico Italiano	CEI	Italy
<b>DIN/VDE</b>	Verband Deutscher Electrotechniker	VDE	Germany
<b>EN</b>	Comité Européen de Normalisation Electrotechnique	CENELEC	Europe
<b>TR</b>	Eurasian Customs Union	EAC	Russia, Belarus, Kazakhstan
<b>Regulation</b>			
<b>IEC</b>	International Electrotechnical Commission	IEC	Worldwide
<b>JIS</b>	Japanese Industrial Standards Committee	JISC	Japan
<b>NBN</b>	Institut Belge de Normalisation	IBN	Belgium
<b>NEN</b>	Nederlands Normalisatie Instituut	NNI	Netherlands
<b>NF</b>	Union Technique de l'Electricité	UTE	France
<b>SAA</b>	Standards Association of Australia	SAA	Australia
<b>UNE</b>	Asociación Española de Normalización y Certificación	AENOR	Spain

### European EN standards

These are technical specifications established in conjunction with, and with approval of, the relative bodies within the various CENELEC member countries (European Union, European Free Trade Association and many central and eastern European countries having «member» or «affiliated» status). Prepared in accordance with the principle of consensus, the European standards are the result of a weighted majority vote. Such adopted standards are then integrated into the national collection of standards, and contradictory national standards are withdrawn.

European standards incorporated within the French collection of standards carry the prefix NF EN. At the 'Union Technique de l'Electricité' (*Technical Union of Electricity*) (UTE), the French version of a corresponding European standard carries a dual number: European reference (NF EN ...) and classification index (C ...).

Therefore, the standard NF EN 60947-4-1 relating to motor contactors and starters, effectively constitutes the French version of the European standard EN 60947-4-1 and carries the UTE classification C 63-110.

This standard is identical to the British standard BS EN 60947-4-1 or the German standard DIN EN 60947-4-1.

Whenever reasonably practical, European standards reflect the international standards (IEC).

With regard to automation system components and distribution equipment, in addition to complying with the requirements of French NF standards, Schneider Electric brand components conform to the standards of all other major industrial countries.

## Regulations

### European Directives

Opening up of European markets assumes harmonisation of the regulations pertaining to each of the member countries of the European Union.

The purpose of the European Directive is to eliminate obstacles hindering the free circulation of goods within the European Union, and it must be applied in all member countries. Member countries are obliged to transcribe each Directive into their national legislation and to simultaneously withdraw any contradictory regulations. The Directives, in particular those of a technical nature which concern us, only establish the objectives to be achieved, referred to as "essential requirements".

The manufacturer must take all the necessary measures to ensure that his products conform to the requirements of each Directive applicable to his production.

As a general rule, the manufacturer certifies conformity to the essential requirements of the Directive(s) for his product by affixing the CE marking.

The CE marking is affixed to Schneider Electric brand products concerned, in order to confirm compliance with French and European regulations.

#### Significance of the CE marking

- The CE marking affixed to a product signifies that the manufacturer declares that the product conforms to the relevant European Directive(s) which concern it; this condition must be met to allow free distribution and circulation within the countries of the European Union of any product subject to one or more of the E.U. Directives.
- The CE marking is intended solely for national market control authorities.
- The CE marking must not be confused with a conformity mark.



# Technical information

## Product standards and certifications

### General - Coordination and standards

#### European Directives

For electrical equipment, only conformity to standards signifies that the product is suitable for its designated function, and only the guarantee of an established manufacturer can provide a high level of quality assurance.

For Schneider Electric brand products, one or several Directives are likely to be applicable, depending on the product, and in particular:

- the Low Voltage Directive 2014/35/EU: the CE marking relating to this Directive has been compulsory since April 2016.
- the Electromagnetic Compatibility Directive 2014/30/EU: the CE marking on products covered by this Directive has been compulsory since April 2016.

#### CB certificate, Asefa/Lovag certificate

- CB certification is issued according to IEC standards in respect to a multilateral agreement between almost industrial countries called CB scheme. It allows international certification of electrical and electronic products so that a single certification facilitates a worldwide market access.
- The function of ASEFA (Association des Stations d'Essais Française d'Appareils électriques - Association of French Testing Stations for Low Voltage Industrial Electrical Equipment) is to carry out tests of conformity to standards and to issue certificates of conformity and test reports. ASEFA laboratories are authorised by the French authorisation committee (COFRAC). ASEFA is now a member of the European agreement group LOVAG (Low Voltage Agreement Group). This means that any certificates issued by LOVAG/ASEFA are recognised by all the authorities which are members of the group and carry the same validity as those issued by any of the member authorities.

#### Quality labels

When components can be used in domestic and similar applications, it is sometimes recommended that a "Quality label" be obtained, which is a form of certification of conformity.

Code	Quality label	Country
CEBEC	Comité Electrotechnique Belge	Belgium
KEMA-KEUR	Keuring van Electrotechnische Materialen	Netherlands
NF	Union Technique de l'Electricité	France
ÖVE	Österreichischer Verband für Electrotechnik	Austria
SEMKO	Svenska Elektriska Materiel Kontrollnätalen	Sweden

#### Product certifications

In some countries, the certification of certain electrical components is a legal requirement. In this case, a certificate of conformity to the standard is issued by the official test authority.

Each certified device must bear the relevant certification symbols when these are mandatory:

Code	Certification authority	Country
CSA	Canadian Standards Association	Canada
UL	Underwriters Laboratories	USA
CCC	China Compulsory Certification	China

Note on certifications issued by the Underwriters Laboratories (UL). There are two levels of approval:

- "Recognized" (UL)** The component is fully approved for inclusion in equipment built in a workshop, where the operating limits are known by the equipment manufacturer and where its use within such limits is acceptable by the Underwriters Laboratories.  
The component is not approved as a "Product for general use" because its manufacturing characteristics are incomplete or its application possibilities are limited.  
A "Recognized" component does not necessarily carry the certification symbol.
- "Listed" (UL)** The component conforms to all the requirements of the classification applicable to it and may therefore be used both as a "Product for general use" and as a component in assembled equipment. A "Listed" component must carry the certification.

#### Marine classification societies

Prior recognition by certain marine classification societies is generally required for electrical equipment which is intended for use on board merchant vessels.

Europe community has emitted regulation No. 391/2009 for common rules for Type approval of Marine equipment.

MR TA Mutual Recognition Type Approval is a certificate that is mutually recognized by all 12 classification societies from the **EU RO MR group** (European Recognized Organizations). Renewal of marine certifications, or new products certification is now covered by EU-MR (Mutual Recognition) process and therefore removes the need for multiple marine certifications. Current EU RO members include all major societies like DNV-GL, BV, ABS, LR as well as non-European societies like CCS, KR, NK, RMRS, etc.

Rules	Classification authority	Country
ABS	American Bureau of Shipping	United States of America
KRoS	Korean register of Shipping	South Korea
BV	Bureau Veritas	France
DNV-GL	Det Norske Veritas - Germanischer Lloyd	Norway - Germany
LRoS	Lloyd's Register of Shipping	Great Britain
NKK	Nippon Kaiji Kyokai	Japan
RINA	Registro Italiano Navale	Italy
RMRoS	Russian Maritime Register of Shipping	Russia
CCS	China Classification Society	Republic of China

**Note:** for further details on a specific product, please refer to the "Characteristics" pages in this catalogue or consult your Regional Sales Office.



# Technical information

## Degrees of protection provided by enclosures IP code

### Introduction - Coordination and standards

#### Degrees of protection against the penetration of solid bodies, water and personnel access to live parts















The European standard EN 60529 dated October 1991, IEC publication 529 (2<sup>nd</sup> edition - November 1989), defines a coding system (IP code) for indicating the degree of protection provided by electrical equipment enclosures against accidental direct contact with live parts and against the ingress of solid foreign objects or water. This standard does not apply to protection against the risk of explosion or conditions such as humidity, corrosive gasses, fungi or vermin.

Certain equipment is designed to be mounted on an enclosure which will contribute towards achieving the required degree of protection (example : control devices mounted on an enclosure).

Different parts of an equipment can have different degrees of protection (example : enclosure with an opening in the base).

Standard NF C 15-100 (May 1991 edition), section 512, table 51 A, provides a cross-reference between the various degrees of protection and the environmental conditions classification, relating to the selection of equipment according to external factors.

Practical guide UTE C 15-103 shows, in the form of tables, the characteristics required for electrical equipment (including minimum degrees of protection), according to the locations in which they are installed.

IP ●●● code									
<b>1<sup>st</sup> characteristic numeral</b>			<b>2<sup>nd</sup> characteristic numeral</b>			<b>Additional letter</b>			
corresponds to protection of the equipment against penetration of solid objects and protection of personnel against direct contact with live parts.			corresponds to protection of the equipment against penetration of water with harmful effects.			corresponds to protection of personnel against direct contact with live parts.			
	<b>Protection of the equipment</b>	<b>Protection of personnel</b>							
<b>0</b>	Non-protected	Non-protected	<b>0</b>	Non-protected		<b>A</b>	With the back of the hand.		
<b>1</b>	 Protected against the penetration of solid objects having a diameter greater than or equal to 50 mm.	Protected against direct contact with the back of the hand (accidental contacts).	<b>1</b>	 Protected against vertical dripping water, (condensation).		<b>B</b>	With the finger.		
<b>2</b>	 Protected against the penetration of solid objects having a diameter greater than or equal to 12.5 mm.	Protected against direct finger contact.	<b>2</b>	 Protected against dripping water at an angle of up to 15°.		<b>C</b>	With a Ø2.5 mm tool.		
<b>3</b>	 Protected against the penetration of solid objects having a diameter greater than or equal to 2.5 mm.	Protected against direct contact with a Ø2.5 mm tool.	<b>3</b>	 Protected against rain at an angle of up to 60°.		<b>D</b>	With a Ø1 mm wire.		
<b>4</b>	 Protected against the penetration of solid objects having a diameter greater than or equal to 1 mm.	Protected against direct contact with a Ø1 mm wire.	<b>4</b>	 Protected against splashing water in all directions.					
<b>5</b>	 Dust protected (no harmful deposits).	Protected against direct contact with a Ø1 mm wire.	<b>5</b>	 Protected against water jets in all directions.					
<b>6</b>	 Dust tight.	Protected against direct contact with a Ø1 mm wire.	<b>6</b>	 Protected against powerful jets of water and waves.					
			<b>7</b>	 Protected against the effects of temporary immersion.					
			<b>8</b>	 Protected against the effects of prolonged immersion under specified conditions.					



# Technical information

## Degrees of protection provided by enclosures IK code

### Introduction - Coordination and standards

#### Degrees of protection against mechanical impact

The European standard EN 50102 dated March 1995 defines a coding system (IK code) for indicating the degree of protection provided by electrical equipment enclosures against external mechanical impact.

Standard NF C 15-100 (May 1991 edition), section 512, table 51 A, provides a cross-reference between the various degrees of protection and the environmental conditions classification, relating to the selection of equipment according to external factors.

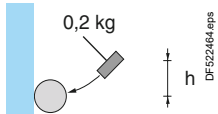
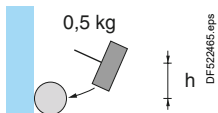
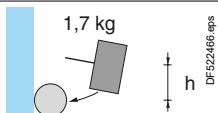
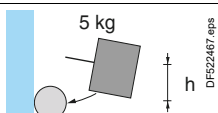
Practical guide UTE C 15-103 shows, in the form of tables, the characteristics required for electrical equipment (including minimum degrees of protection), according to the locations in which they are installed.

#### IK ●● code

The IK code comprises **2 characteristic numerals** (e.g. IK 05).

#### 2 characteristic numerals

corresponding to a value of impact energy.

		h (cm)	Energy (J)
00	Non-protected		
01		7.5	0.15
02		10	0.2
03		17.5	0.35
04		25	0.5
05		35	0.7
06		20	1
07		40	2
08		30	5
09		20	10
10		40	20



# Part B

## COMPONENTS FOR CUSTOMER MADE SOLUTIONS

### Linergy BZ, HK

Busbar systems

Up to 630 A



B1/1

Power  
busbar  
systems

### TeSys GV, LAD, U

Motor starter wiring systems



B2/1

Wiring  
systems

### TeSys Vario

Switch-disconnectors

Up to 175 A



B3/1

Switch-  
disconnectors

### TeSys DF, LS, GK

Fuse carriers

Up to 125 A



B4/1

Fuse  
carriers

### TeSys GS

Switch-disconnector fuses

Up to 1250 A



B5/1

Switch-  
disconnectors  
fuses

### TeSys GB, GV

Circuit breakers

Up to 250 kW



B6/1

Circuit  
breakers

### TeSys SK, K, D

Control relays



B7/1

Control  
relays

### TeSys D, SK, K, SKGC, GC, GY, GF

Contactors

Up to 200 A



B8/1

Contactors

### TeSys F

High power contactors

Up to 2100 A



B9/1

High power  
contactors

### TeSys B

Bar mounted contactors

Up to 16300 A



B10/1

Bar mounted  
contactors

### TeSys LR, RM1X, LRD

Overload relays

Up to 630 A



B11/1

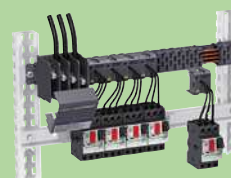
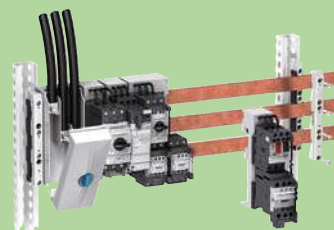
Overload  
relays





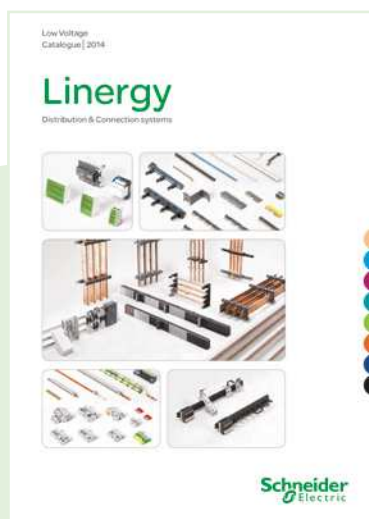


Busbar systems for electrical distribution and motors starters		
Type of product	Range	Pages
Introduction Linergy BZ		B1/2
Multistandard power busbar Linergy BZ	From 160 to 630 A	B1/4
Introduction Linergy HK		B1/10
Multistandard hot-plug distribution system Linergy HK	Up to 160 A	B1/12



Technical Data for Designers

B1/17



All Schneider Electric **distribution and connection systems** are brought together into a single brand name:  
**Linergy**

Distribution blocks  
Device feeders  
Power busbars  
Hot plug busbar system  
Terminal blocks and bars.

Catalogue reference: **LVYED213001EN**



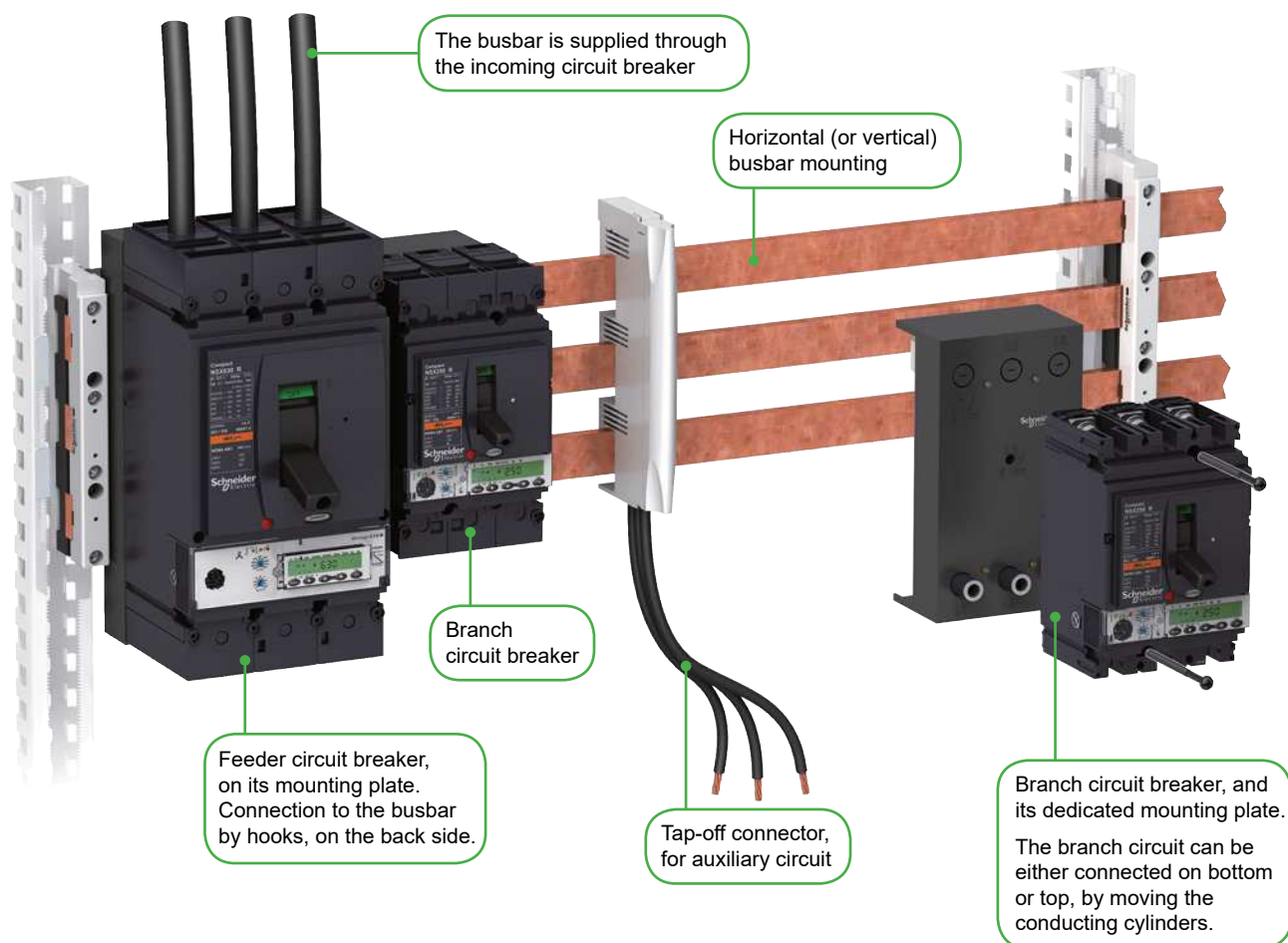
# Linergy BZ, HK Busbar systems

## Linergy BZ - Electrical distribution up to 630 A

### Introduction

In enclosures, when space saving and fast connection are a strong requirement

Power  
busbar  
systems



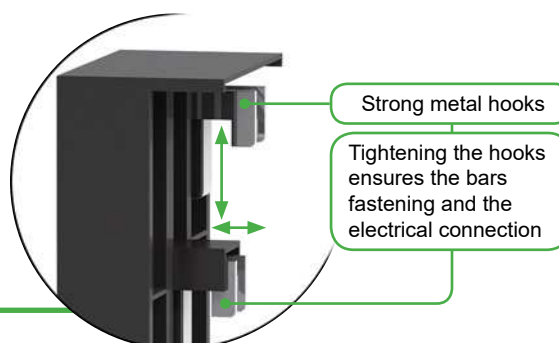
Ideal for  
industrial  
process  
application

### Advantages

- Considerable space saving: components are directly mounted on the busbar
- Quick connection, disconnection: a metal hook combines mechanical fastening and electrical connection
- Multi standard: conform to IEC and UL standards

### Detailed view: back face of a mounting plate

- Mounting plates, for Compact NSX, Powerpact and GV5 circuit breakers
- Compatible with bars:
  - Height 12, 15, 20, 25 or 30 mm,
  - Width 5 or 10 mm



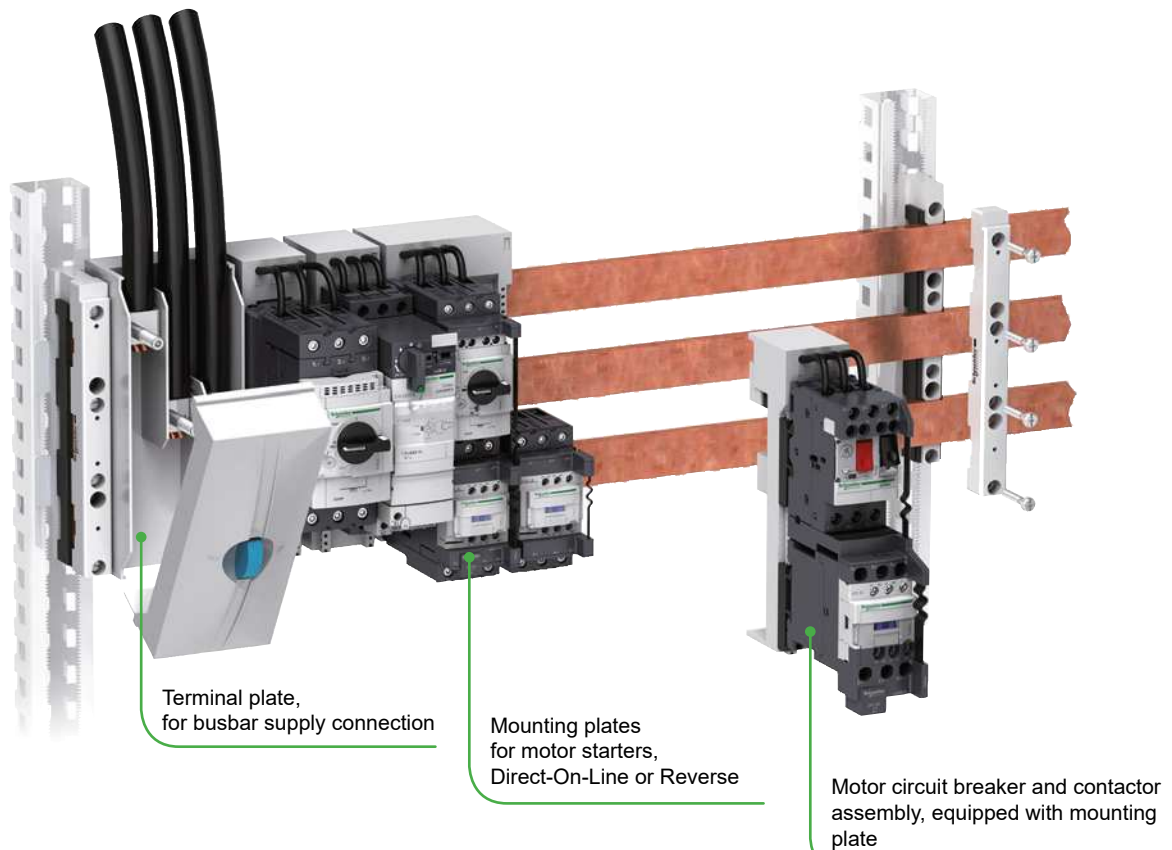


# Linergy BZ, HK Busbar systems

## Linergy BZ - Electrical distribution to motor starters

### Introduction

In control switchboards, when space saving, quick mounting and replacement are required

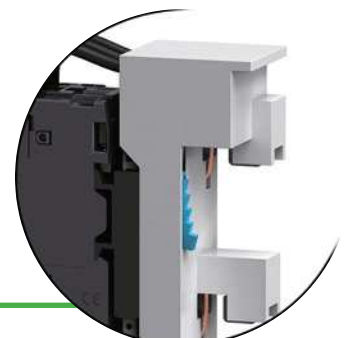


### Advantages

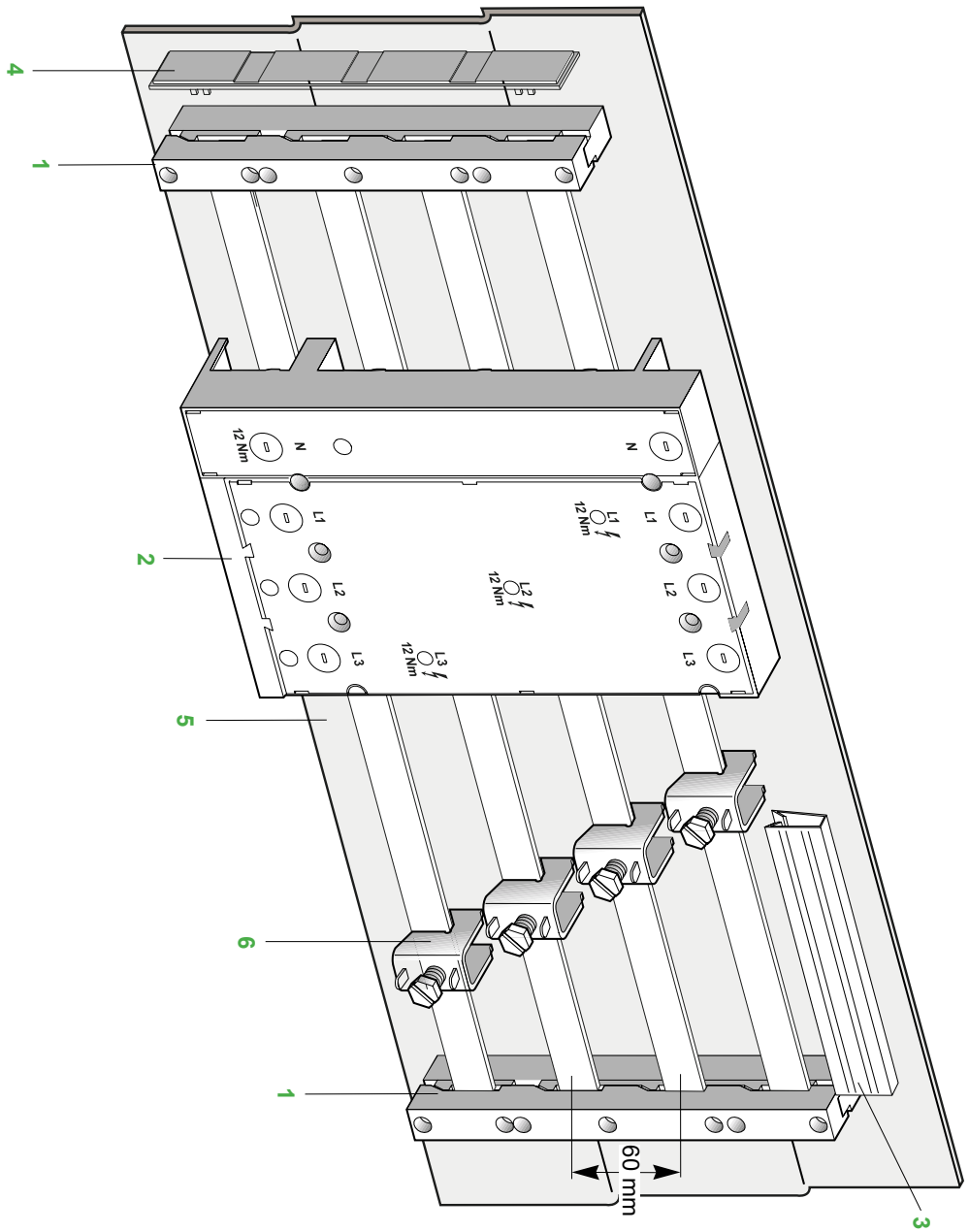
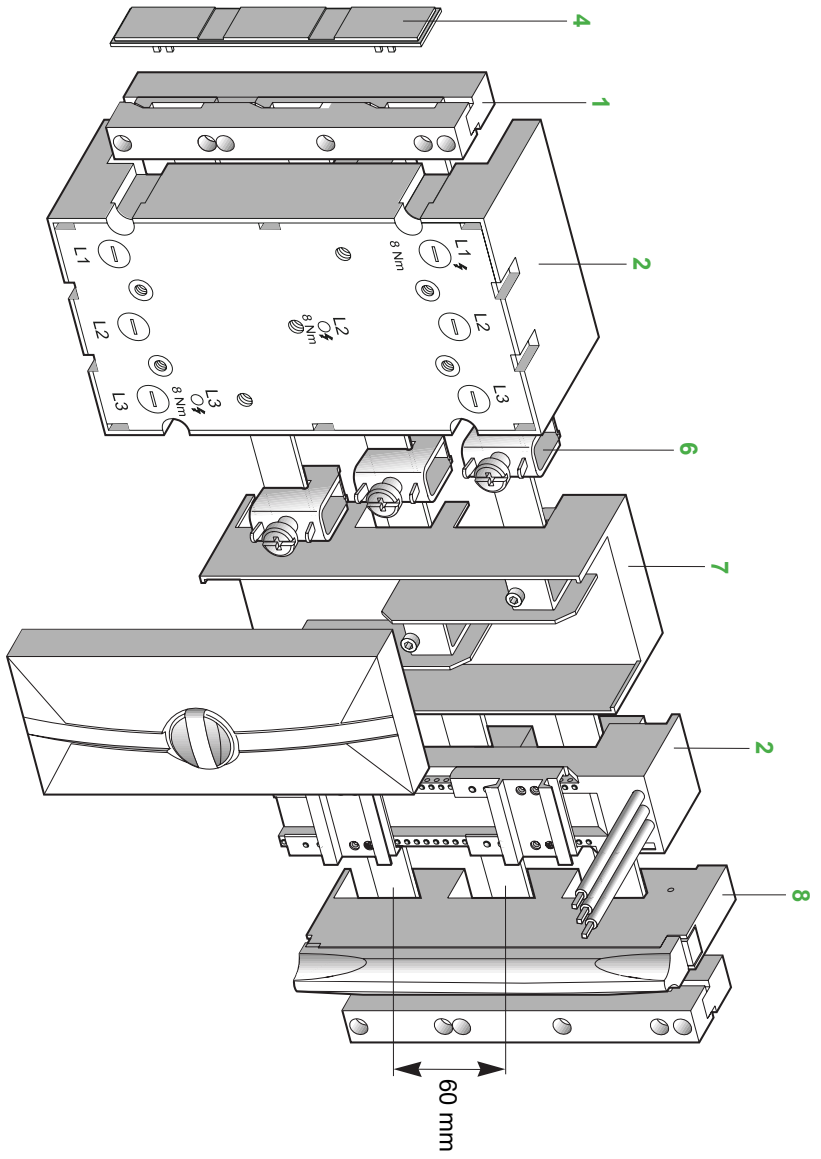
- Considerable space saving: components are directly mounted on the busbar
- Large choice of mounting plates (for GV2, GV3 motor circuit breakers and assemblies, GV5, TeSys U)
- Quick connection, deconnection (power off): clip-on mounting plates
- Vibration resistant busbar connections: no periodical re-tightening required
- Multi standard: conform to IEC and UL standards

### Detailed view: back face of a motor starter mounting plate

- A reliable electrical contact is ensured by copper blades
- The blue part locks the mounting plate on the busbar, compatibility is provided with the standard profiles:
  - Height 12, 15, 20, 25 or 30 mm,
  - Width 5 or 10 mm





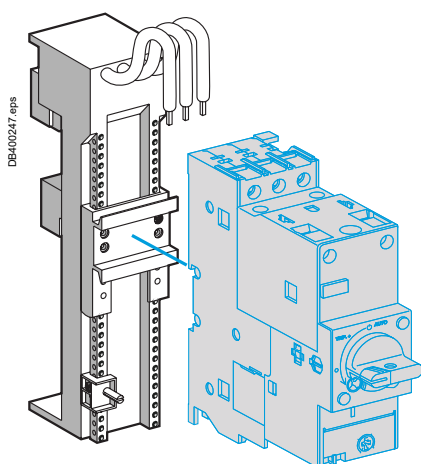
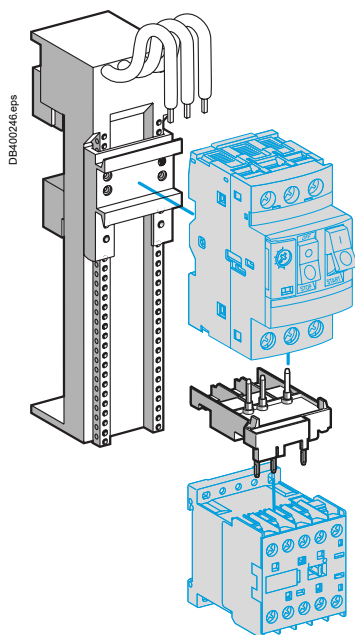




# Linergy BZ, HK Busbar systems

## Linergy BZ - Mounting plates for motor starters

### Introduction



Installation examples.

### Description

The TeSys mounting plate system for busbars simplifies the installation of motor feeder components used in your electrical installations. Power distribution is performed by a busbar.

The mounting plates are fitted directly on this busbar, by snap-on mounting, thus implementing mechanical and electrical connection.

This system offers numerous benefits:

- space saving in cabinets
- fast, safe and reliable electrical and mechanical connection
- easy connection
- protection for users against electric shocks by direct contacts (IP20) by using busbars end covers
- equipment flexibility and modularity
- increased equipment availability: easier maintenance
- power supply without drilling (connectors) from 1.5 to 120 mm<sup>2</sup>.

### Busbars system

The busbar interaxis is 60 mm. Depending on the cross section of the bars, the busbar can withstand a maximum current of 630 A.

**Note:** The bars forming the busbar are not part of the TeSys LA9Z offer. They are not supplied by us. Their selection depends on the maximum current needed for your installation (see next page).

### Support for 3P and 4P busbar (1)

These are available in 2 versions: three-pole and four-pole.

For applications having to comply with the UL standard, use the LA9ZX01508 support (3P only).

### The mounting plates (2)

These allow mounting of the power feeder components consisting of:

- a GV2 motor circuit breaker, mounted alone or in conjunction with a TeSys K or TeSys D contactor
- a GV3 motor circuit breaker, mounted alone or in conjunction with a TeSys D contactor
- a TeSys U starter-controller
- a TeSys GV5 motor circuit breaker
- an LD63 integral contactor-circuit breaker
- a NSX100-250 or NSX400-630 A circuit breaker
- H/J/L PowerPact circuit breaker frame.

### Accessories

Accessories complete the offer:

- covers (3) for 5 and 10 mm bars
- end covers (4)
- a base plate (5)
- 1P connectors (6)
- 3P connectors on mounting plate (7)
- a spring terminal 3P connection module (8).



# Linergy BZ, HK Busbar systems

## Linergy BZ - Busbar supports and accessories

### Product references

Power  
busbar  
systems

PB112445.eps



PB112441.eps



LA9ZX01573

LA9ZX01495

PB112433.eps



PB112440.eps



LA9ZX01131

LA9ZX01485

PB112445.eps



PB112442.eps



LA9ZX01573

LA9ZX01508

PB112435.eps



LA9ZX01244

#### IEC busbar supports and accessories

		Min. order qty	Unit reference
3-pole	For 12, 15, 20, 25, 30 x 5/10 mm busbars	10	LA9ZX01495
	End covers for 3-pole busbar support	10	LA9ZX01573
4-pole	For 12, 15, 20, 25, 30 x 5/10 mm busbars	10	LA9ZX01485
	End covers for 4-pole busbar support (5 left, 5 right)	10	LA9ZX01131

#### UL busbar supports and accessories

		Min. order qty	Unit reference
3-pole	For 12, 20, 30 x 5/10 mm busbars	10	LA9ZX01508
	Base plate 240 x 700	2	LA9ZX01515
	End covers for busbar support	10	LA9ZX01573

#### Other accessories

		Min. order qty	Unit reference
Covers, length 1 m			
	For 12-30 x 5 mm busbars	10	LA9ZX01244
	For 12-30 x 10 mm busbars	10	LA9ZX01245



# Linergy BZ, HK Busbar systems

## Linergy BZ - Mounting plates

### Product references



LA9ZA32627



LV429372



LA9ZA32600



LV432624

#### For TeSys integral contactor-circuit breakers

Operating current AC-3 440 V	Protection by contactor-circuit breaker	Mounting plate l x h x d	Min. order qty	Unit reference
<b>Mounting plate, 1-way</b>				
63 A	LD1, LD4LD●	108 x 260 x 63	1	LA9ZA32627

#### For TeSys GV5/GV6 motor circuit breakers

Ratings		Mounting plate l x h x d	Min. order qty	Unit reference
<b>Mounting plate for 3P</b>				
150/220 A	GV5	104 x 190 x 63	1	LV429372
320/500 A	GV6	139 x 270 x 63	1	LV432623

#### For TeSys GV5/GV6 circuit breakers

Ratings		Mounting plate l x h x d	Min. order qty	Unit reference
100-250 A	Mounting plate for 3P circuit breakers	104 x 190 x 63	1	LV429372
	Mounting plate for 4P circuit breakers	139 x 251 x 63	1	LV429373
400-630 A	Mounting plate for 3P circuit breakers	139 x 270 x 63	1	LV432623
	Mounting plate for 4P circuit breakers	184 x 284 x 63	1	LV432624

#### For PowerPact 3P circuit breakers

Ratings		Mounting plate l x h x d	Min. order qty	Unit reference
60-100-150 A	Mounting plate for H frame circuit breakers	104 x 190 x 63	1	LA9ZA32600
250 A	Mounting plate for J frame circuit breakers	104 x 190 x 63	1	LV429372
250-400-600 A	Mounting plate for L frame circuit breakers	139 x 270 x 63	1	LV432623

#### Characteristics of busbar mounting plates

Type of mounting plate		LA9ZA32621 LA9ZA32622	LA9ZA32427 LA9ZA32428 LA9ZA32434 LA9ZA32623 LA9ZA32442 LA9ZA32443	LA9ZA32624 LA9ZA32625 LA9ZA32626 LA9ZA32627	LV429372 LV429373	LV432623 LV432624	LA9ZA32600
Degree of protection as per IEC 60529	IP	20					
Rated insulation voltage	V	690					
Permissible current	A	25	32	63	80-100-250	400-630	60-100-150
Peak rated current	kA	50	50 <sup>(1)</sup>	50	50	50	50
SCCR (UL) with Compact NSX circuit breaker protection	mm <sup>2</sup>	The reinforced breaking capacity due to cascading in circuit breaker combination is maintained					
Conductor cross section (color: black)	mm <sup>2</sup>	4	6	10	NA		
	AWG	12	10	8	NA		
Type of conductor insulating material	PVC	105°			NA		

<sup>(1)</sup> 35 kA with LUB12 for LA9ZA32427 and LA9ZA32428.



# Linergy BZ, HK Busbar systems

## Linergy BZ - Mounting plates

### Product references

Power  
busbar  
systems



LA9ZA32443, LA9ZA32621



LA9ZA32434,  
LA9ZA32442



LA9ZA32622



LA9ZA32623



LA9ZA32427



LA9ZA32428



LA9ZA32624



LA9ZA32625



LA9ZA32626

#### For TeSys GV2 motor circuit breakers

Operating current AC-3 440 V	Protection by motor circuit breaker	For contactor	Mounting plate l x h x d	Min. order qty	Unit reference
<b>Mounting plate, 1-way</b>					
25 A	GV2ME GV2P GV2LE	LC1D LC1K LP4K06-K12	45 x 200 x 63	4	LA9ZA32621
32 A	GV2LE		63 x 200 x 63	4	LA9ZA32443
<b>Mounting plate, 2-way <sup>(3)</sup></b>					
25 A	GV2ME GV2P GV2LE	LC1D LC1K LP4K06-K12	90 x 200 x 63	2	LA9ZA32622
32 A	GV2ME GV2P GV2LE	LC1D	45 x 200 x 63	4	LA9ZA32434
			54 x 200 x 63	4	LA9ZA32442
			90 x 200 x 63	2	LA9ZA32623

#### TeSys U starter-controllers

Operating current AC-3 440 V	Protection by power base	Mounting plate l x h x d	Min. order qty	Unit reference
<b>Mounting plate, 1-way</b>				
32 A	LUB12, LUB32	45 x 200 x 63	4	LA9ZA32427
<b>Mounting plate, 2-way</b>				
32 A	LUB12, LUB32	45 x 260 x 63	4	LA9ZA32428

#### For TeSys GV3 motor circuit breakers

Operating current AC-3 440 V	Protection by power base	For contactor	Mounting plate l x h x d	Min. order qty	Unit reference
<b>Mounting plate, 1-way <sup>(1)</sup></b>					
63 A	GV3P	—	54 x 200 x 63	4	LA9ZA32624
	GV3P	LC1D40A...65 A	54 x 260 x 63	4	LA9ZA32625
<b>Mounting plate, 2-way <sup>(1) (2)</sup></b>					
63 A	GV3P	LC2D40A...65 A	117 x 260 x 63	4	LA9ZA32626

<sup>(1)</sup> Contactor-circuit breaker combination without additional part.

<sup>(2)</sup> Use the LAD9R3 kit for the execution of changeover contactors.

<sup>(3)</sup> Use the LAD9R1 or LAD9R1V kit for the execution of changeover contactors.

**Note:** the mounting plate rails can be shifted vertically in 1.25 mm increments.



# Linergy BZ, HK Busbar systems

## Linergy BZ - Accessories

### Product references



LA9ZX01285



LA9ZX01287



LA9ZX01413



LA9ZX01243



LA9ZX01563

#### Terminals

	I max		Set of	Unit reference
One-pole for flat bars, 5 mm	270 A	Capacity 4-35 mm <sup>2</sup>	50	LA9ZX01285
	400 A	Capacity 16-70 mm <sup>2</sup>	25	LA9ZX01287
3P cover, width 84 mm			10	LA9ZX01413

Power  
busbar  
systems

#### Terminals on mounting plate

	I max		Min. order qty	Unit reference
3P, on mounting plate + cover, for 12 x 5 to 30 x 10 busbars, width 81 mm	440 A	Capacity 35-120 mm <sup>2</sup>	1	LA9ZX01243
3P, on mounting plate + cover, for 20 x 5 to 30 x 10 busbars, width 135 mm	560 A	Capacity 120-300 mm <sup>2</sup>	1	LA9ZX01754

#### Connection module

	I max		Min. order qty	Unit reference
3P, spring terminal connection + cover, for 12 x 5 to 30 x 10 busbars, width 20 mm	80 A	Capacity 1.5-16 mm <sup>2</sup>	8	LA9ZX01563



#### Connection by connectors

		LA9ZX01285		LA9ZX01287		LA9ZX01243		LA9ZX01563		LA9ZX01754	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Flexible wire	mm <sup>2</sup>	4	35	16	70	35	120	1.5	16	120	300
Multi-strand wire	mm <sup>2</sup>	4	35	16	70	35	120	1.5	16	120	300
Rigid wire	mm <sup>2</sup>	4	35	—	—	—	—	1.5	16	—	—
Tightening torque	N.m	... x 5		... x 5		... x 5-10		... x 5-10		... x 5-10	
Cover		LA9ZX01413		LA9ZX01413		Supplied without cover		Supplied without cover		Supplied without cover	



# Linergy BZ, HK Busbar systems

## Linergy HK - Electrical distribution up to 160 A

### Introduction

#### Hot-plug distribution: when continuity of service is required

Power  
busbar  
systems

The busbar is supplied through the incoming circuit breaker

Pluggable busbar for 1, 2, 3, 4 pole sockets

IPxxB: no finger access when socket is removed

Outgoers circuit breakers

Pre-cabled sockets

#### Advantages

- Considerable time saving: stand alone busbar, fixed to the chassis with 2 screws
- Preserved continuity of service during modification: live connection, disconnection (off load)
- Wide adaptability: 6 busbar lengths from 344 to 1100 mm, 12 models of sockets
- Multi standard: conform to IEC and UL standards

#### Detailed view: pre cabled socket

- The assembling process and the technological choices ensure a long-lasting reliability
- Each wire is welded on a spring clip providing robustness to the socket and vibration resistant contacts



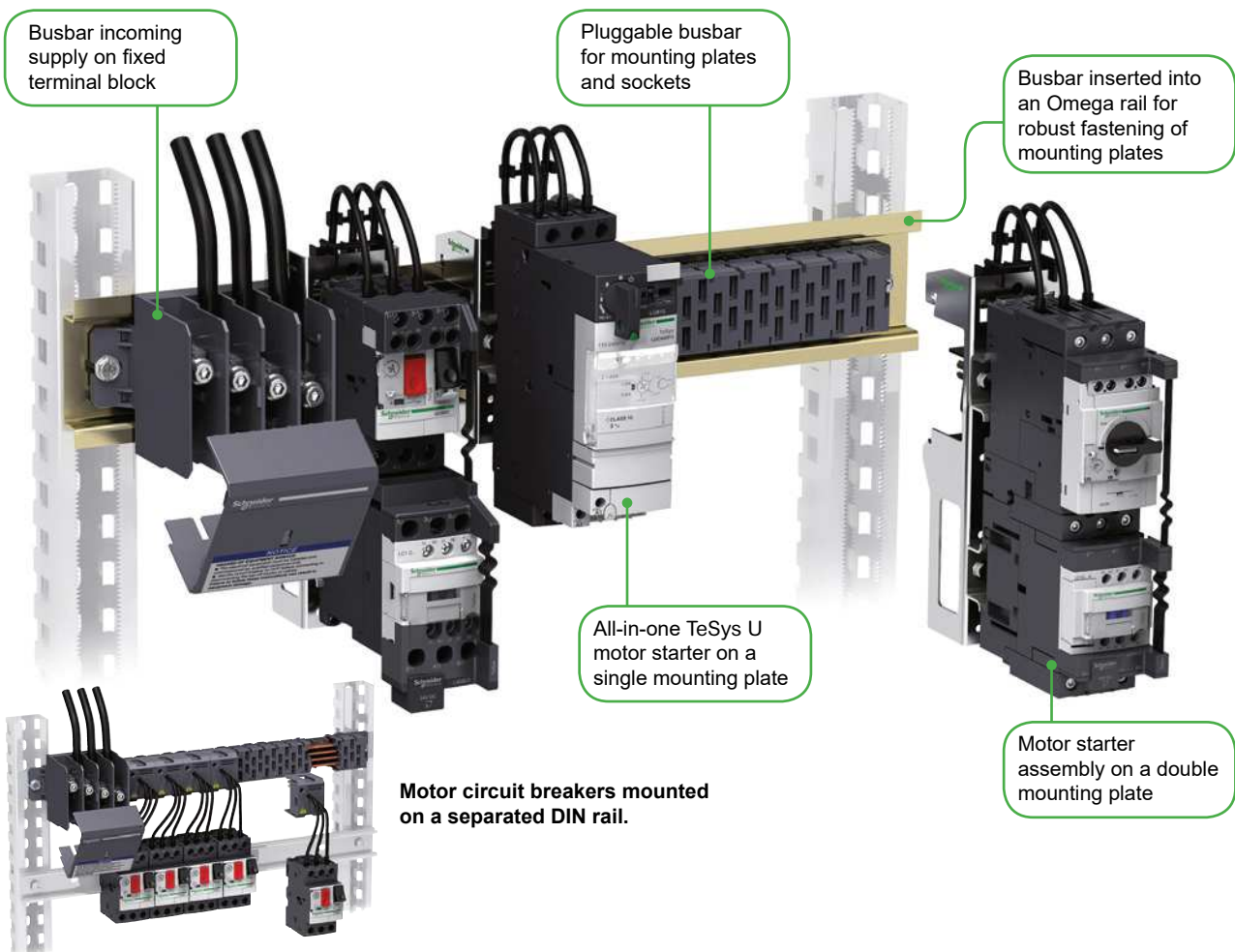


# Linergy BZ, HK Busbar systems

## Linergy HK - Electrical distribution to motor starters

### Introduction

When compactness and continuity of service are required

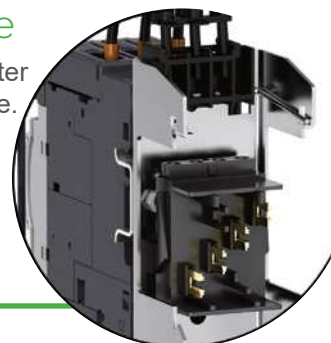


### Advantages

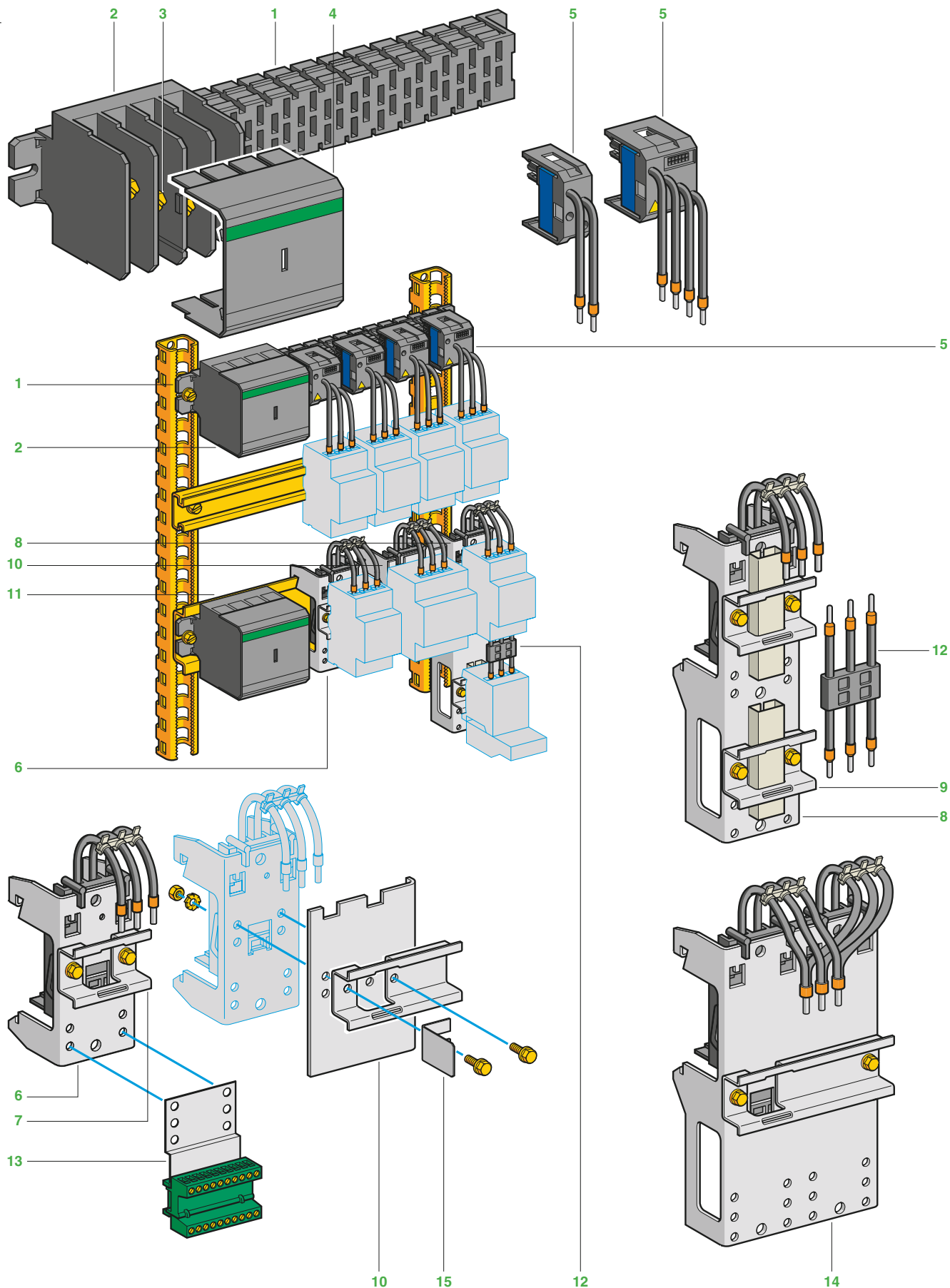
- Space saving in compact enclosures: the total volume is reduced to that of the motor starter assemblies
- Preserved continuity of service during modification and maintenance: live connection, disconnection (off load)
- Wide adaptability: 6 busbar lengths from 344 to 1100 mm, 12 models of sockets, 23 mounting plates for motor starters up to 25 or 50 A
- Multi standard: conform to IEC and UL standards

### Detailed view: mounting plate back face

- Thanks to the plug and its pre-cabled wires the motor starter is safely assembled in the workshop, for immediate or later use.
- A piece of DIN profile rail is attached on the front face of the mounting plate for fastening the components.
- The metal mounting plate ensures a rigid and robust fastening on the omega rail.









The assembly of automated control and distribution panels requires the use of products that are not only safe but also simple and quick to mount and cable.

The Linergy HK pre-assembled busbar system meets all these criteria by incorporating prefabricated components which cater for 3 principal functions:

#### Carrying of electric current

By the pre-assembled 4-pole busbar system **1**, 160 A at 35 °C.

4-pole busbars can be used for 3-phase + Neutral or 3-phase + Common.

The busbars are available in 6 lengths: 344, 452, 560, 668, 992, 1100 mm.

An incoming supply terminal block **2** is located at the extreme left of the busbar.

"Knock-out" partitions allow connection of the power supply from above or below to connectors **3** which are protected by a removable cover **4**.  
Upstream protection of the busbar is shown on page B1/20.

#### Current distribution

Tap-off units **5** (factory assembled) are available in 4 versions:

- 2-pole,
- 3-pole,
- 4-pole (3-phase + Neutral),
- 4-pole (3-phase + Common).

The tap-offs clip onto the busbar with instantaneous mechanical and electrical connection to the busbars.

2 ratings are available: 16 and 32 A.

The tap-off units ensure not only rapid mounting, but also a neat appearance for the power distribution system and complete safety when accessing under live circuit conditions.



#### Component mounting

Component mounting plates with incorporated tap-off allow mounting of and supply of power to components.

They are available in 25 A or 50 A ratings.

These mounting plates clip onto the mounting rail **11**, which also supports the busbar, and at the same time make electrical connection via the incorporated tap-off.

2 types of mounting plate are available:

- single plates **6** (height 105 mm), with bolt-on 35 mm wide  rail **7**, which may be bolted on in one of two positions, allowing height adjustment of 10 mm.
- double plates **8** and **14** (height 190 mm), with two bolt-on, 35 mm wide  rails **9** mounted on 100 mm fixing centres; each rail may be bolted on in one of 4 positions, allowing height adjustment in 10 mm steps. These plates are supplied with connectors **12** to allow wiring between control and protection devices.

Single mounting plates enable the following types of distribution:

- 2-pole (Ph + N) and (Ph + Ph)
- 3-pole,
- 4-pole (3 Ph + N or 3 Ph + common).

Double mounting plates enable the following types of distribution: 2-pole (Ph + N, Ph + Ph), 3-pole or 4-pole (3Ph+N and 3Ph + common).

Extension plates **10** can be bolted onto single and double mounting plates to enable mounting of wider components. Using a side stop **15** in conjunction with these extension plates also supports the Linergy HK busbar when used vertically.

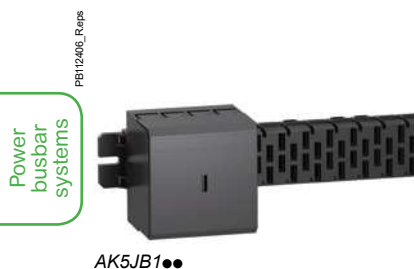
A control terminal block **13** comprising a support plate bolted onto the single or double mounting plates and a 10-pole plug-in block, enables connection of the control circuit wires (c.s.a. 1.5 mm² max).



# Linergy BZ, HK Busbar systems

## Linergy HK

### Product references



#### Busbars

The busbars can be screw-mounted onto any type of support. However, if it is to be used in conjunction with component mounting plates incorporating a tap-off, it is essential that it is mounted on the AM1DL201 rail.

When mounting tap-offs, the rated operational current of the busbar should be taken into account: 160 A at 35 °C.

Number of conductors	Number of tap-offs at 18 mm intervals	Length mm	Suitable for mounting in enclosure width mm	Reference	Weight kg
4 <sup>(1)</sup>	12	344	600	AK5JB143	0.700
	18	452	800	AK5JB144	0.900
	24	560	800	AK5JB145	1.100
	30	668	800	AK5JB146	1.300
	48	992	1200	AK5JB149	1.900
	54	1100	1200	AK5JB1410	2.100

#### Removable power sockets

Use	Number of points used on the busbar system		Thermal current A	Cable lengths mm	Min. order qty	Unit reference
	Width					
Single-phase + Neutral	1	9 mm	16	200	6 <sup>(2)</sup>	AK5PC12
			32	1000	6 <sup>(2)</sup>	AK5PC32L
2-phase	1		16	200	6 <sup>(3)</sup>	AK5PC12PH
			32	1000	6 <sup>(3)</sup>	AK5PC32LPH
3-phase	2	18 mm	16	200	6	AK5PC13
			32	250	6	AK5PC33
				1000	6	AK5PC33L
3-phase + Neutral	2		16	200	6	AK5PC14
			32	250	6	AK5PC34
				1000	6	AK5PC34L
3-phase + common	2		16	200	6	AK5PC131
			10 (common)			
			32	250	6	AK5PC331
			10 (common)			

#### Accessories

Description	Maximum no. of connections	C.s.a. mm <sup>2</sup>	Sold in lots of	Unit reference
Cable guide	4	2.5 or 4	20	AK5GF1

<sup>(1)</sup> 4-pole: 3-phase + Neutral or 3-phase + Common.

<sup>(2)</sup> Total of 6 sockets supplied: 2 sockets (N + L1), 2 sockets (N + L2), 2 sockets (N + L3).

<sup>(3)</sup> Total of 6 sockets supplied: 2 sockets (L1 + L2), 2 sockets (L1 + L3), 2 sockets (L2 + L3).

<sup>(4)</sup> Cut and drill to suit use.







AK5PA231



AK5PA242



AM1DL201

#### Component mounting plates incorporating tap-off

##### Single plate (height 105 mm)

Use	No. of 18 mm points used on the busbar system	Phase	Thermal current A	Number of 18 mm rails for component support	Min. order qty	Reference
Single-phase + neutral	3 (54 mm width)	Ph1+N	25	1	1	AK5PA211N1
		Ph2+N	25	1	1	AK5PA211N2
		Ph3+N	25	1	1	AK5PA211N3
2-phase	3	Ph1+Ph2	25	1	1	AK5PA211PH12
		Ph1+Ph3	25	1	1	AK5PA211PH13
		Ph2+Ph3	25	1	1	AK5PA211PH23
3-phase	3	—	25	1	1	AK5PA231
3-phase + common	3	—	25	1	1	AK5PA2311
3-phase + neutral	3	—	25	1	1	AK5PA241

##### Double plate (height 190 mm)

Prefabricated 25 A connectors are supplied for connecting the 2 protection and control devices.

Single-phase + neutral	3	Ph1+N	25	2	1	AK5PA212N1
		Ph2+N	25	2	1	AK5PA212N2
		Ph3+N	25	2	1	AK5PA212N3
2-phase	3	Ph1+Ph2	25	2	1	AK5PA212PH12
		Ph1+Ph3	25	2	1	AK5PA212PH13
		Ph2+Ph3	25	2	1	AK5PA212PH23
3-phase	3	—	25	2	1	AK5PA232
	6 (108 mm width)	—	25	2	1	AK5PA232S
		—	50	1	1	AK5PA532
3-phase + neutral	3	—	25	2	1	AK5PA242
3-phase + common	3	—	25 (10 common)	2	1	AK5PA2312
	6	—	25 (10 common)	2	1	AK5PA2312S
	6	—	50 (10 common)	1	1	AK5PA5312
3-phase + neutral	6	—	50	1	1	AK5PA542

##### Omega rail, width 75 mm

This rail is designed to accommodate the busbar system when it is used with Linergy HK mounting plates incorporating tap-offs. It supports the busbar system. The plates simply clip onto the rail.

Material and surface treatment	Depth	Length	Min. order qty	Reference	Weight
	mm	mm			kg
2 mm sheet steel	15	2000 <sup>(4)</sup>	6	AM1DL201	3.000



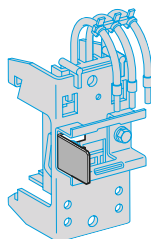


PB112404.eps



AK5BT01

DF552389.eps



PB112415.eps



AK5SB1

PB121278.eps



AB1R4

### Extension plates

These plates bolt onto the equipment support plates, after having removed them from the rails, to be able to mount wider components.

Use	Number of tap-offs at 18 mm intervals	Reference
For mounting plates incorporating Single tap-off	4	AK5PE17
Double tap-off	4	AK5PE27

### Side stop (AK5JB mounted vertically)

Use	Set of	Reference
For extension plate (for AK5PA●●●)	50	AK5BT01

### Control terminal blocks

Description	Thermal current A	Set of	Reference
10-pole terminal blocks, for screwing onto plate AK5 PA●●●	10	10	AK5SB1

### Accessories

Description	Marking	Set of	Reference
Strips of clip-in markers 10 identical numbers, signs or capital letters per strip	0...9	25	AB1R● <sup>(1)</sup>
	+	25	AB1R12
	-	25	AB1R13
	A...Z	25	AB1G● <sup>(1)</sup>

<sup>(1)</sup> Replace the ● in the selected reference with the number or letter required. Example: AB1R1 or AB1GA.

#### Note:

■ if the equipment is wider than the mounting plate, an extension plate can be used to increase the width of the support plate.

■ for upstream protection, see page B1/20.



## Technical Data for Designers

### Contents

#### Lineryg BZ:

- > characteristics ..... B1/18
- > curves ..... B1/19

#### Lineryg HK:

- > characteristics ..... B1/20 and B1/21
- > dimensions ..... B1/22 and B1/23



# Linergy BZ, HK Busbar systems

## Linergy BZ

### Characteristics

Power  
busbar  
systems



LA9ZX01495



LA9ZX01485



Ref.

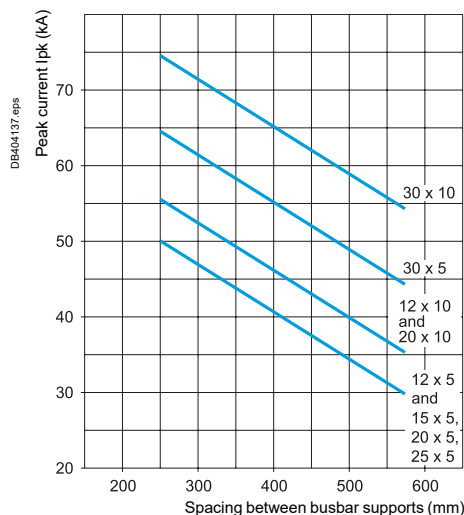


LA9ZX01508

General characteristics									
		LA9ZX01495 and LA9ZX01485 (IEC 6.439-1)							
Bar dimensions compatibility	mm	12 x 5	15 x 5	20 x 5	25 x 5	30 x 5	12 x 10	20 x 10	30 x 10
Max. rated operating current	A	200	250	320	400	450	360	520	630
Min. peak permissible rated current	kA	30	30	30	30	45	35	35	53
Distance max. between 2 busbars supports	mm	570	570	570	570	570	570	570	570
Degree of protection	IP	20 (with cover LA9ZX01244 or LA9ZX01245)							
Thermal resistance	°C	125							
Rated current frequency	Hz	50/60							
Rated insulation voltage	V	690							
Rated operating voltage	V	690							
		LA9ZX01508 (UL) 508 A							
Bar dimensions compatibility	mm	12 x 5	20 x 5	30 x 5	12 x 10	20 x 10	30 x 10		
Rated operating current	A	150	362	500	300	564	630		
I <sub>eff</sub> (RMS) surge current	kA	18	18	22 - 25	18	18	22 - 25		
SCCR (protected by Compact NSX circuit breaker)	250 A 480 V AC	65	-	-	65	-	-		
	250 A 600 V AC	25	-	-	25	-	-		
	400 A 480 V AC	-	65	65	-	65	65		
	400 A 600 V AC	-	35	35	-	35	35		
	500 A 480 V AC	-	-	65	-	-	65		
	600 A 600 V AC	-	-	35	-	-	-		
	600 A 480 V AC	-	-	50	-	-	50		
	600 A 600 V AC	-	-	25	-	-	25		
SCCR (protected by fuses Class J or T ...)	400 A 480 V AC	100	100	100	100	100	100		
	500 A 480 V AC	-	-	100	-	-	100		
	500 A 600 V AC	-	-	100	-	-	100		
Distance max. between 2 busbars supports (busbar protected)	mm	400	800	800	400	800	800		
Degree of protection	IP	20 (with cover LA9ZX01244 or LA9ZX01245)							
Thermal resistance	°C	125							
Rated current frequency	Hz	50/60							
Rated operating voltage	V	600							

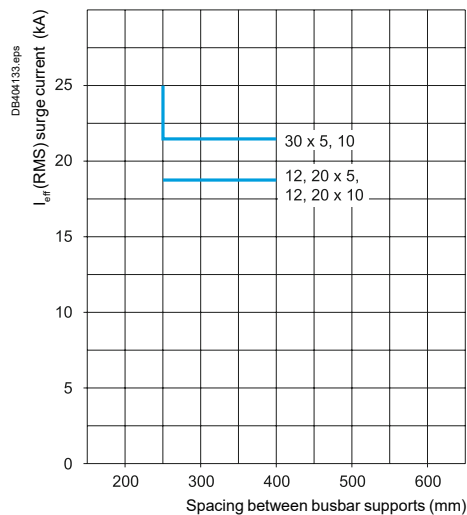


#### Determining the spacing between busbar supports (LA9ZX01495 and LA9ZX01485), according to IEC 61439-1 <sup>(1)</sup>



(1) Depending on the short-circuit current.

#### Short-circuit strength diagram according to UL845 (LA9ZX01508)

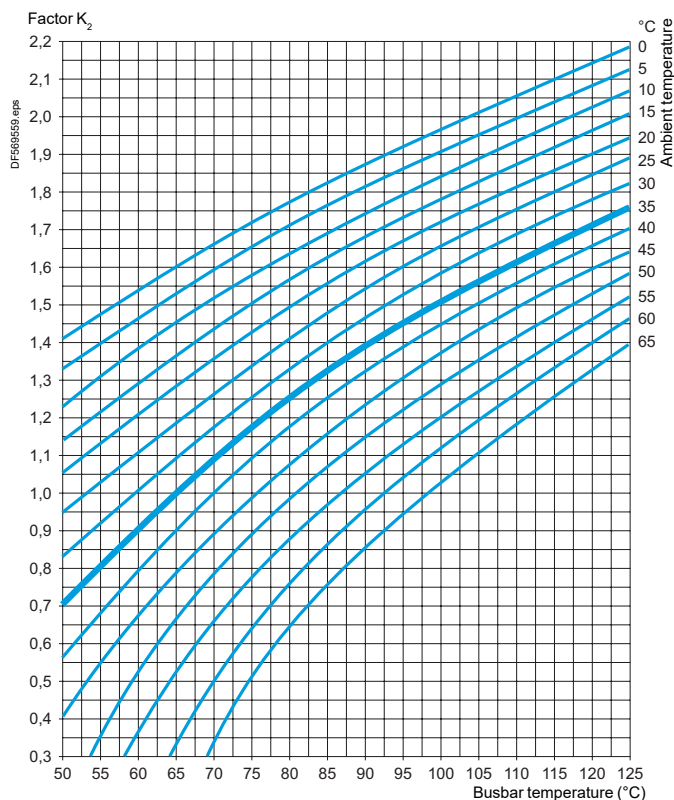


#### Load resistance of busbar assemblies in IEC applications

For an ambient temperature of 35 °C and a busbar temperature of 65 °C

Cross section	mm <sup>2</sup>	12 x 5	15 x 5	20 x 5	25 x 5	30 x 5	12 x 10	20 x 10	30 x 10
Permissible current	A	200	250	320	400	450	360	520	630

In the event of changes in climatic conditions, the following curve indicates the correction factor  $K_2$  to be applied.



**Example:** In normal operating conditions, a tinned busbar of 30 x 10 can permanently withstand 630 A.

For a load of 800 A, the correction factor  $K_2$  to be applied will be 1.3 ( $\frac{800 \text{ A}}{630 \text{ A}}$ ). As a result, the temperature rise in the busbars will reach 82.5 °C.



# Linergy BZ, HK Busbar systems

## Linergy HK

### Characteristics

Power  
busbar  
systems

i

Ref.



Busbar system characteristics								
Conforming to standards			IEC 60439					
Product certifications			UL, CSA, DNV, LROS					
Degree of protection	Against access to live parts		IP XXB conforming to IEC 60529					
Flame resistance	Conforming to IEC 60695	°C	850 (incandescent wire)					
	Conforming to standard UL 94		V0					
Number of conductors	AK5JB14●		4					
Supply current			~					
Rated operational frequency		Hz	50 or 60					
Rated operational current	Ambient temperature 35 °C	A	160					
	Coefficient K to be applied according to the ambient temperature	°C	35	40	45	50	55	60
		K	1	0.96	0.92	0.88	0.83	0.78
Rated insulation voltage	Conforming to IEC 60439-1	V	690					
	Conforming to UL and CSA	V	600					
Operational voltage			Off-load plugging-in and unplugging, with supply switched on					
	Conforming to IEC 60439-1	V	400					
	Conforming to UL, CSA	V	480					
			Plugging-in and unplugging, with supply switched off					
	Conforming to IEC 60439-1	V	690					
	Conforming to UL, CSA	V	600					
Maximum permissible peak current		kA	25					
Maximum let-through energy		A²s	1 x 10 <sup>7</sup>					
Upstream short-circuit <sup>(1)</sup> and overload protection	Type of protection		Schneider Electric circuit-breaker			Fuses		
			NSX 160 N	NSX 160 H	aM	gF		
	Rating	A	160	160	160	160		
	Prospective short-circuit current	kA	36	70	100	100		
	Operational current	A	160	160	160	160		
	Cabling			Maximum c.s.a.			Minimum c.s.a.	
Flexible cable with cable end		mm²	70			2.5		
Solid cable		mm²	70			2.5		
Tightening torque		Nm	10					
Mounting position		Horizontal or vertical <sup>(2)</sup>		Fixing with screws provided				

(1) For conditions where conditional short-circuit current exceeds 25 kA.

(2) Using side stop **AK5BT01** on mounting plates **AK5PA**.




# Linergy BZ, HK Busbar systems

## Linergy HK

### Characteristics

Tap-off characteristics											
Type		AK5 PC12	AK5 PC12PH	AK5 PC13	AK5 PC14	AK5 PC131	AK5 PC32L	AK5 PC32LPH	AK5 PC33 PC33L	AK5 PC34 PC34L	AK5 PC331
Conforming to standards		IEC 60439									
Product certifications		UL, LROS, CSA, DNV									
Degree of protection		Against access to live parts: IP XXB conforming to IEC 529									
Polarity		Phase + Neutral	Phase + Phase	3-phase	3-phase + Neutral	3-phase + Common	Phase + Neutral	Phase + Phase	3-phase	3-phase + Neutral	3-phase + Common
Conductor c.s.a. (UL cables)	mm²	2 x 2.5	2 x 2.5	3 x 2.5	4 x 2.5	3 x 2.5 1 x 1.5	2 x 4	2 x 4	3 x 4	4 x 4	3 x 4 1 x 1.5
Conductor colours		Black Blue (Neutral)	Black	Black	Black Blue (Neutral)	Black White	Black Blue (Neutral)	Black	Black	Black Blue (Neutral)	Black White (Common)
Permissible current	A	16	16	16	16	16 10 (Common)	32	32	32	32	32 10 (Common)
Rated insulation voltage	V	690 conforming to IEC 60439-1									
Rated peak current	kA	6									
Maximum let-through energy	A²s	100 000					200 000				
Type of conductor insulation		PVC 105 °C									

Tap-off characteristics									
Type		AK5 PA211N1 PA211N2 PA211N3 PA212N1 PA212N2 PA212N3	AK5 PA211PH12 PA211PH13 PA211PH23 PA212PH12 PA212PH13 PA212PH23	AK5 PA231 PA232 PA232S	AK5 PA241 PA242	AK5 PA2311 PA2312 PA2312S	AK5 PA532	AK5 PA542	AK5 PA5312
Conforming to standards		IEC 60439							
Product certifications		UL, LROS, CSA, DNV							
Degree of protection		Against access to live parts: IP XXB conforming to IEC 60529							
Polarity		Phase + Neutral	Phase + Phase	3-phase	3-phase + Neutral	3-phase + Common	3-phase	3-phase + Neutral	3-phase + Common
Conductor c.s.a. (UL cables)	mm <sup>2</sup>	2 x 4	2 x 4	3 x 4	4 x 4	3 x 4 1 x 1.5	2 x (3 x 4)	2 x (4 x 4)	2 x (3 x 4) 1 x 1.5
Permissible current	A	25	25	25	25	25 10 (Common)	50	50	50 10 (Common)
Rated insulation voltage	V	690 conforming to IEC 60439-1							
Rated peak current	kA	6							
Maximum let-through energy	A <sup>2</sup> s	200 000							
Type of conductor insulation		PVC 105 °C							

Characteristics of mounting rails AM1DL201	
Type	Omega  (width 75 mm, depth 15 mm)
Material	2 mm sheet steel
Surface treatment	Galvanized



# Linergy BZ, HK Busbar systems

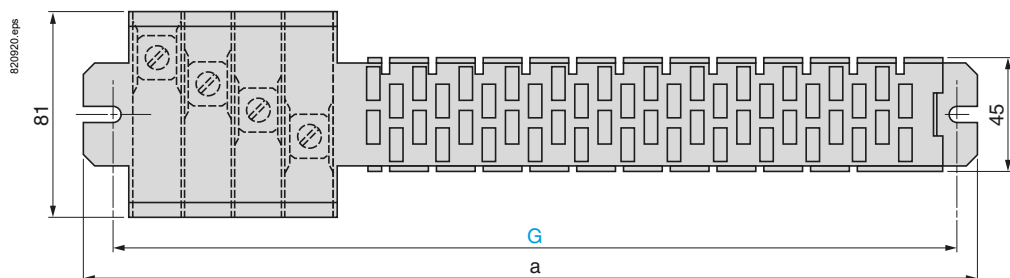
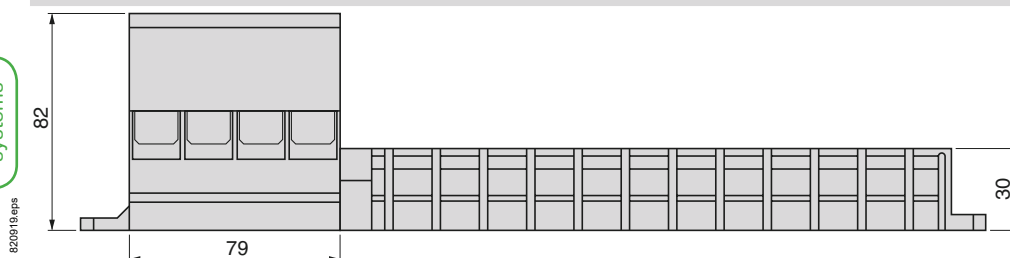
## Linergy HK

### Dimensions

Power  
busbar  
systems

#### Busbars

##### AK5JB●●●

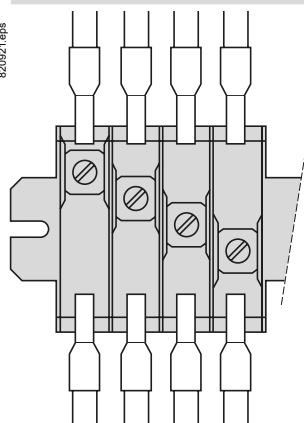


AK5	a	G	No. of 18 mm points
JB143	344	330	12
JB144	452	438	18
JB145	560	546	24
JB146	668	654	30
JB149	992	978	48
JB1410	1100	1086	54

#### Busbar feed units

##### AK5JB●●●

##### Installation of AK5JB●●● busbar systems



##### Connection

C.s.a. in mm<sup>2</sup>

min max

Flexible cable with or without cable end



1 x 2.5	1 x 70 <sup>(1)</sup>
2 x 2.5	2 x 35

Flexible bar



—	2 x (9 x 4)
---	-------------

Flexible bar



9 x 4	9 x 4
+	+
1 x 2.5	1 x 35

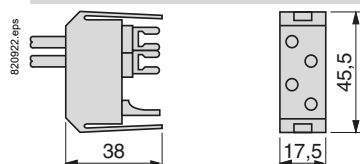
+  
flexible cable with or without cable end



<sup>(1)</sup> Maximum c.s.a. or connection of conductor without cable end.

#### Removable power sockets 16 and 32 A

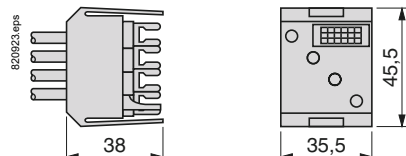
##### AK5PC12●. AK5PC32L●



##### AK5PC●3. AK5PC33L

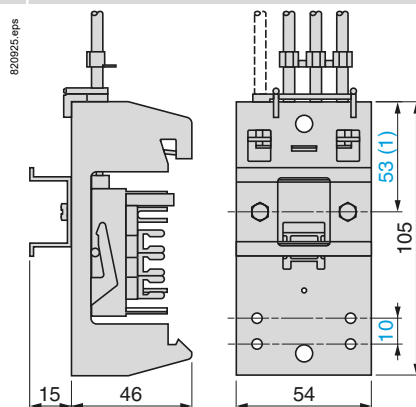
##### AK5PC●4. AK5PC34L

##### AK5PC●31



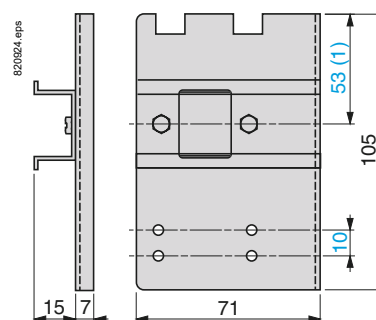
#### Mounting plates incorporating tap-offs, 25 A

##### AK5PA2●1. AK5PA2311. AK5PA211●●●●



#### Single width extension plates

##### AK5PE17



**Note:** It is recommended that the power sockets or the removable plates are connected as close as possible to the busbar feed unit.

<sup>(1)</sup> Can be fixed at 43 mm.

Introduction:  
page B1/13

References:  
pages B1/14 to B1/16

Characteristics:  
pages B1/20 and B1/21



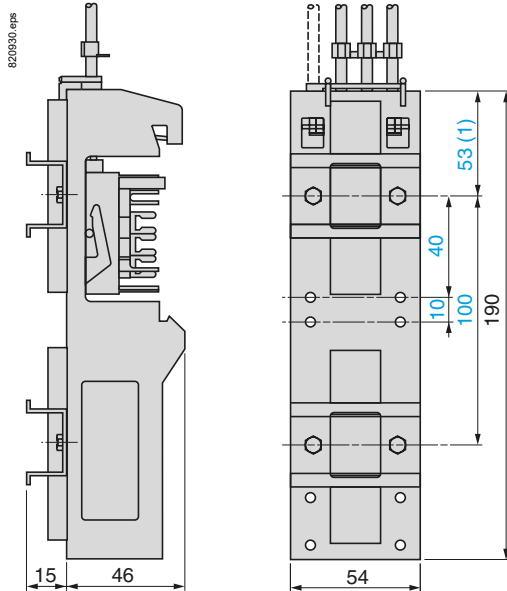
# Linergy BZ, HK Busbar systems

## Linergy HK

### Dimensions

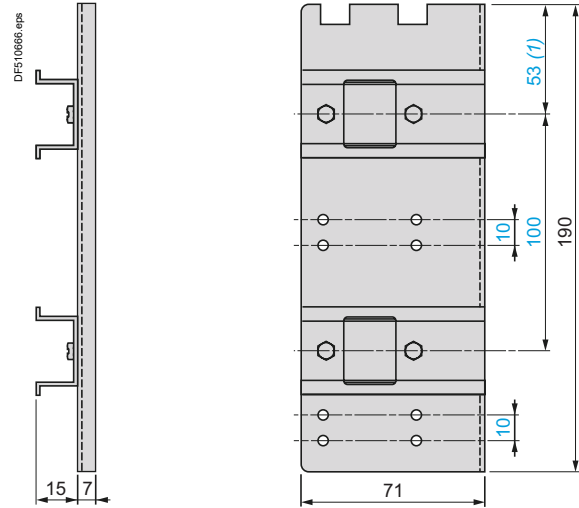
#### Component mounting plates incorporating tap-off

AK5PA232. AK5PA2312. AK5PA242



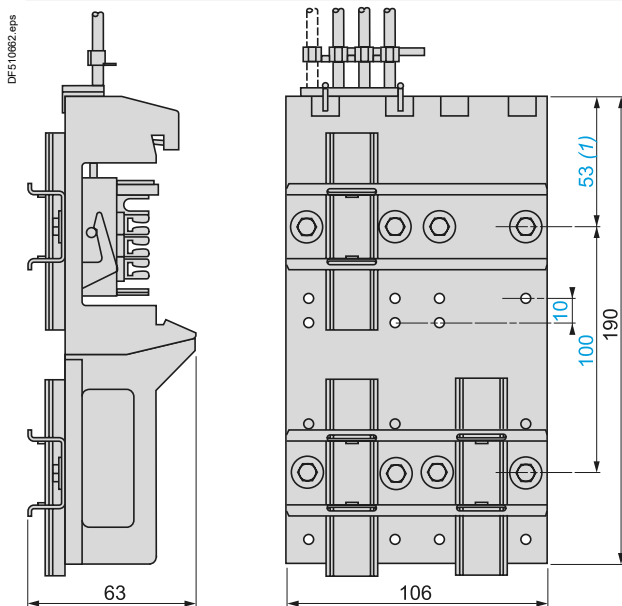
#### Double extension plate

AK5PE27

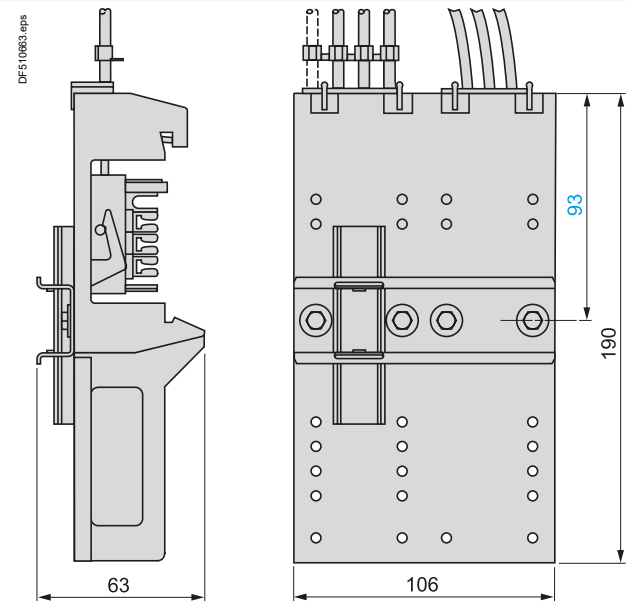


#### Component mounting plates incorporating tap-off

AK5PA232S. AK5PA2312S

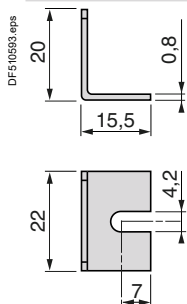


AK5PA532. AK5PA5312. AK5PA542



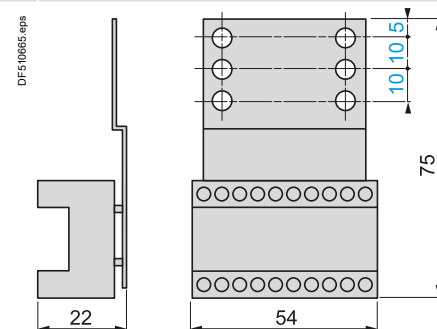
#### Side stop

AK5BT01



#### Control terminal block

AK5SB1

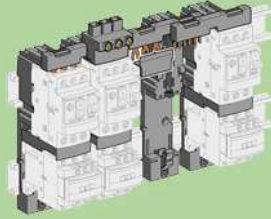





(1) Can be fixed at 43 mm.

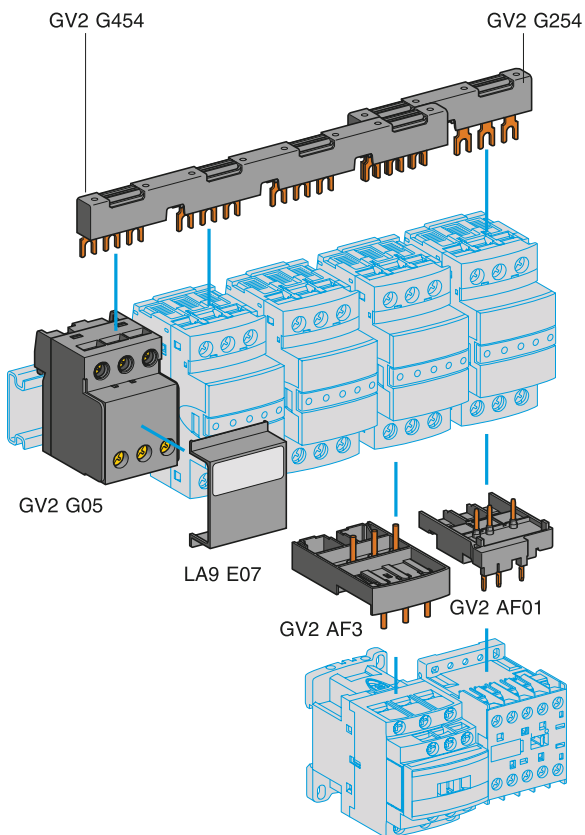
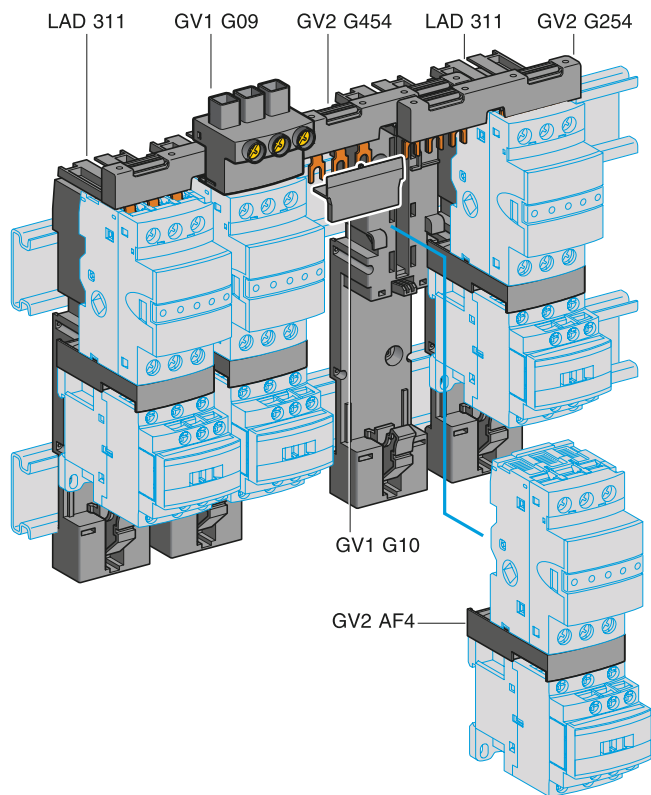
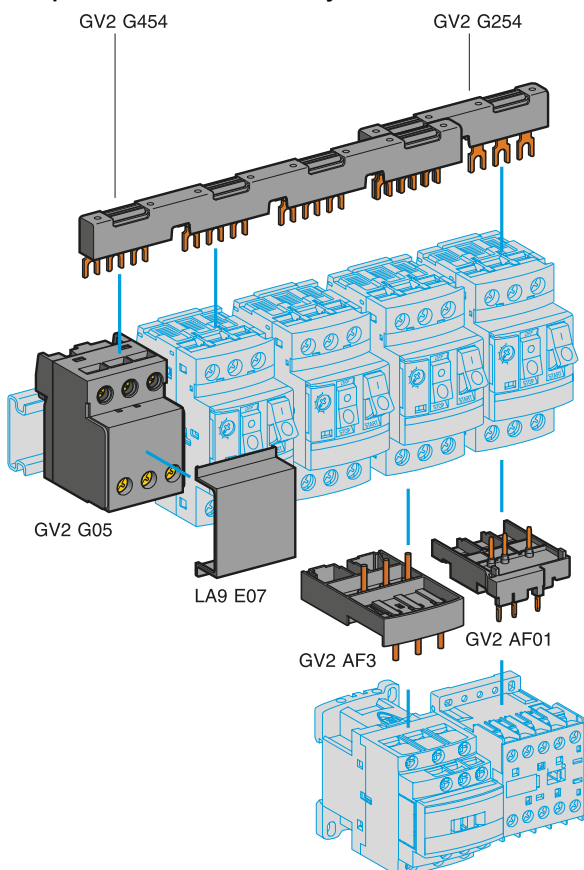
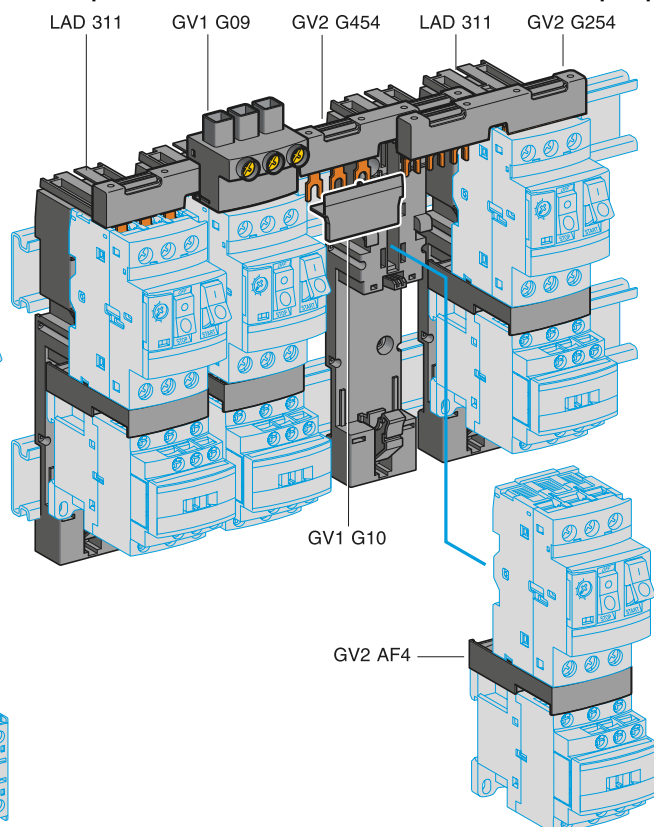






Power wiring systems for motor starters	
Type of product	Pages
Power wiring system for motor starter assemblies: screw clamp connection <b>TeSys GV</b>	 B2/2
Power wiring system for motor starter assemblies: spring terminals connection <b>TeSys LAD3</b>	 B2/4
RJ45 Control wiring systems for motor starters	
Motor starters-to-PLC Control wiring architectures Selection tables	B2/6
RJ45 connection modules for circuit breakers + contactors <b>Spring terminals</b> <b>TeSys LAD9</b>	 B2/8
RJ45 connection module for <b>TeSys U</b> motor starter <b>Pluggable</b> <b>TeSys LUFC00</b>	 B2/10



**Group of fuse carriers directly mounted on DIN rail****Group of fuse carriers + contactors mounted on adapter plates****Group of circuit breakers directly mounted on DIN rail****Group of circuit breakers + contactors mounted on adapter plates**



This system is convenient when time and space savings are required.

The motor starter can be composed of:

- LS1D323 fuse carrier + LC1D contactor
- GV2 circuit breaker + LC1D contactor.

### Upstream busbars and terminals

Description	Application	Pitch (mm)	Unit reference
Sets of 3-pole 63 A busbars	2 tap-offs	45	GV2G245
		54	GV2G254
		72	GV2G272
	3 tap-offs	45	GV2G345
		54	GV2G354
	4 tap-offs	45	GV2G445
		54	GV2G454
		72	GV2G472
	5 tap-offs	54	GV2G554
Description	Application	Sold in lots of	Unit reference
Terminal block for supply to one or more GV2G busbar sets	Connection from the top	1	GV1G09
	Can be fitted with current limiter GV1L3 (GV2ME and GV2P)	1	GV2G05
Cover for terminal block	For mounting in modular panels	10	LA9E07
Protective end cover	For unused busbar outlets	5	GV1G10

### Assembling components

Description	Application	Sold in lots of	Unit reference
Combination blocks	Between GV2 and contactor LC1K or LP1K <sup>(1)</sup>	10	GV2AF01
	Between GV2 and contactor LC1D09...D38 <sup>(1)</sup>	10	GV2AF3
	Between GV2 mounted on LAD311 and contactor LC1D09...D38	10	GV2AF4
Adapter plates	For mounting a GV2ME and contactor LC1D09...D38 with front faces aligned	1	LAD311
Height compensation plate	7.5 mm	10	GV1F03

<sup>(1)</sup> Ensures both the connection and a rigid support to the contactor. No extra fixing mean required.

### Accessories

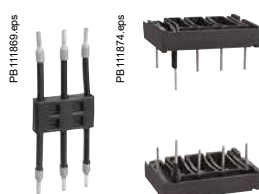
Description	Application	Sold in lots of	Unit reference
Adapter plates	For mounting a GV2 by screw fixing	10	GV2AF02
Motor starter adapter plate	For mounting a GV2 and a contactor LC1D09...D25. Item delivered with a GV1G02 flexible connection	1	GK2AF01
Flexible 3-pole connection for connecting a GV2 to a contactor LC1-D09...D25	Centre distance between mounting rails: 100...120 mm	10	GV1G02
Set of connections upstream/downstream	For connecting GV2ME to a printed circuit board	10	GV2GA01
Incoming line spacer for UL 508 Type E applications	For GV2P (except 32 A)	1	GV2GH7
Clip-in marker holders (supplied with each circuit breaker)	For GV2 P, GV2L, GV2LE and GV2RT (8 x 22 mm)	100	LA9D92



GV2AF02



GK2AF01

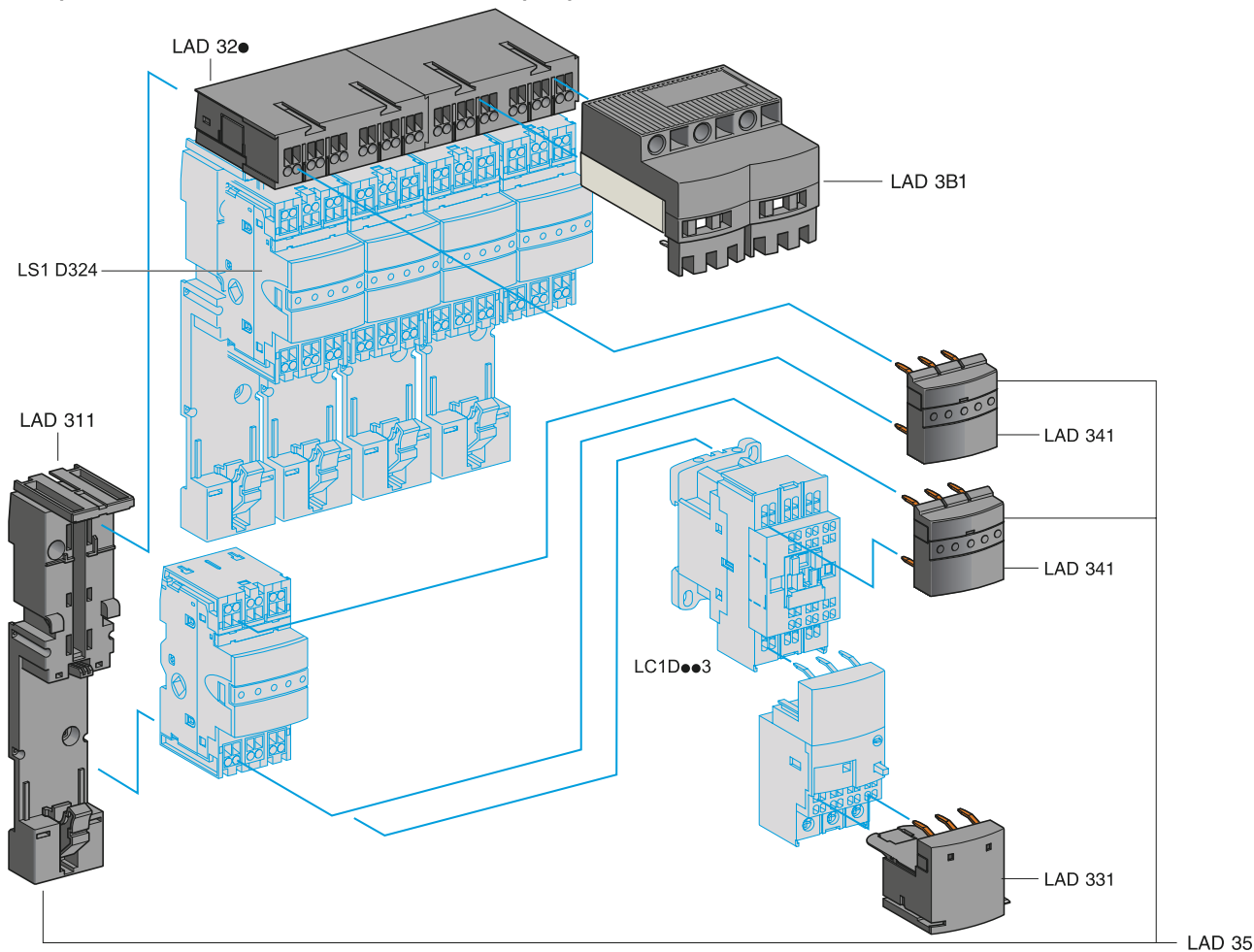


GV1G02

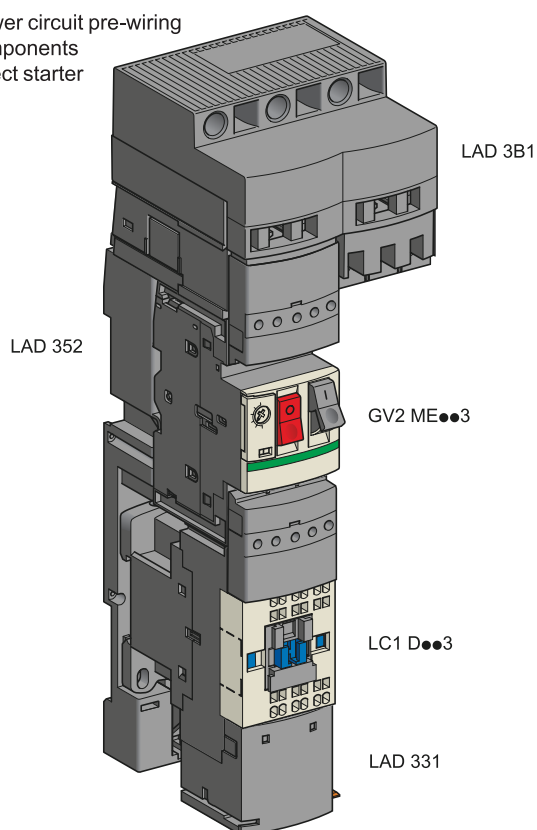
GV2GA01



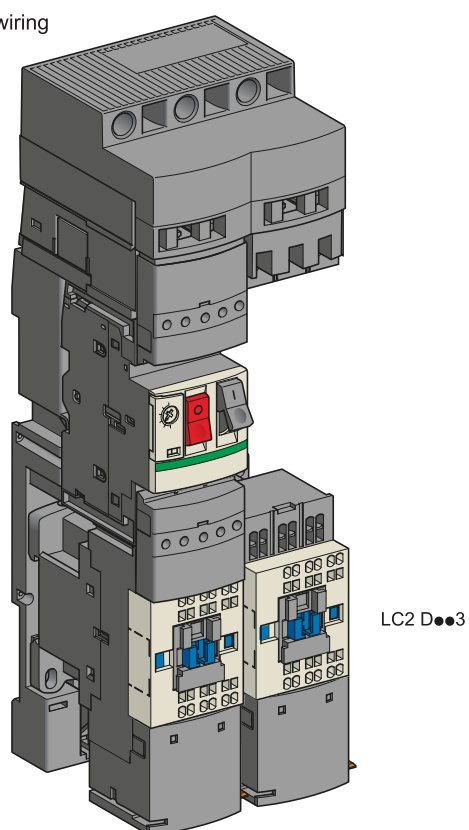
# Group of fuse carriers + contactors mounted on adapter plates



## Power circuit pre-wiring components Direct starter



## Power circuit pre-wiring components Reversing starter







LAD3B1



LAD324



LAD311



LAD341



LAD331

This system is convenient when time and space savings are required.

The motor starter can be composed of:

- LS1D323 fuse carrier + LC1D contactor.
- GV2 circuit breaker + LC1D contactor

#### Upstream terminal and splitter blocks

Description	Maximum connection c.s.a.	Application	Sold in lots of	Reference
Upstream terminal block	16 mm <sup>2</sup> <sup>(1)</sup>	Power supply of 1 or 2 power splitter boxes	1	LAD3B1
Description	Extension by	Number of starters		Reference
Power splitter box, 60 A	LAD324	2	1	LAD322
		4	1	LAD324

#### Assembling components

Description	Composition	Sold in lots of	Reference
Plate for mounting a GV2ME circuit breaker and a contactor	For 1 starter	10	LAD311
Power connection module	For 1 starter	10	LAD341
Power connection kit for direct starter <sup>(2)</sup>	1 plate LAD311 for GV2ME and 2 power connection modules LAD341		LAD352

#### Downstream terminal and accessory

Description	Maximum connection c.s.a.	Application	Sold in lots of	Reference
Downstream terminal block	6 mm <sup>2</sup>	Connection of motor cables	10	LAD331
Cable end reducer	-	For connection of conductors from 1 to 1.5 mm <sup>2</sup>	20	LAD99

<sup>(1)</sup> Cables with one end pre-crimped are available to allow fast connection. References:

1 set of 3 x 6 mm<sup>2</sup> cables (length 1 m: LAD3B061, length 2 m: LAD3B062 and length 3 m: LAD3B063),  
1 set of 3 x 10 mm<sup>2</sup> cables (length 1 m: LAD3B101, length 2 m: LAD3B102 and length 3 m: LAD3B103),  
1 set of 3 x 16 mm<sup>2</sup> cables (length 1 m: LAD3B161, length 2 m: LAD3B162 and length 3 m: LAD3B163).

<sup>(2)</sup> To build a reversing starter, order 2 kits LAD352.



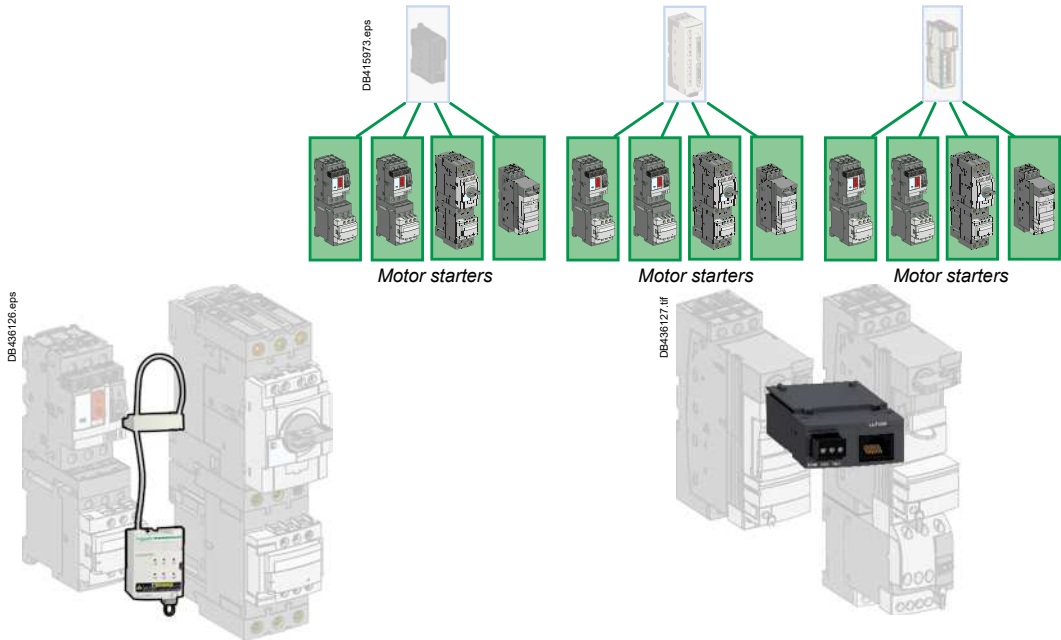
Product type	Connection interfaces for a group of motor starters		
IO system name	Modicon TM3	Modicon Telefast	Modicon STB
Architecture	<div></div> <div></div>	<div></div> <div></div>	<div></div> <div></div>
Application	Control of single or multiple motor-starters assemblies by mean of a logic controller. Machines or processes requiring easy, fast cabling and replacement of motor starters.		
Function	<b>IO module:</b> Ensures the direct connection of up to <b>4 motor starters</b> to logic controller (Modicon M221, M241, M251)	<b>Splitter box:</b> Ensures the connection of up to <b>8 motor starters</b> to a logic controller via Modicon Telefast multiwire cable	<b>IO module:</b> Ensures the connection of up to <b>4 motor starters</b> to a logic controller via an automation island (Modicon STB distributed IO architecture)
Upstream compatibility	With Modicon M221, M241, M251 logic controller, via logic controller internal bus	With any logic controller equipped with HE10 inputs/ outputs module	With Modicon STB automation island, via automation island internal bus
Upstream connectors	Backplane bus connector	HE10 connector	Backplane bus connector
Compatibility	All types of motor starters equipped with RJ45 connection system		
Motor control	Reversing / Non reversing		
Number of motor starters	4	8	4
Downstream connector type	RJ45		
Reference	TM3XTYS4	LU9G02 / LU9G03	STBEPI2145K *
Pages	Refer to Modicon M221/M241/ M251 catalogue	TeSys U - page B2/10 and A3/32	Refer to IP20 distributed IO Modicon STB catalogue

\* STBEPI2145K: GV2 + contactor D09 to D32, TeSys U only.



RJ45 connection components for motor starter

Common components for Modicon TM3, Modicon Telefast, Modicon STB systems



**Connection module:**  
ensures the compatibility of circuit breaker  
+ contactor assemblies with spring terminals  
to the RJ45 connection system

**Connection module:**  
ensures the compatibility TeSys U motor starters to the RJ45  
connection system

TM3XTYS4 / LU9G02 / LU9G03 / STBEP12145K

RJ45

GV2ME / GV3P

TeSys D: 9 to 32 A (GV2ME), 40 to 65 A (GV3P)

Spring

Non reversing

Reversing

TeSys U  
12 to 38 A

Screw-clamp

Reversing or Non reversing

Plugin modules

LAD9AP3●●

B2/8

Plugin module

LUFC00

B2/10

Wiring  
systems

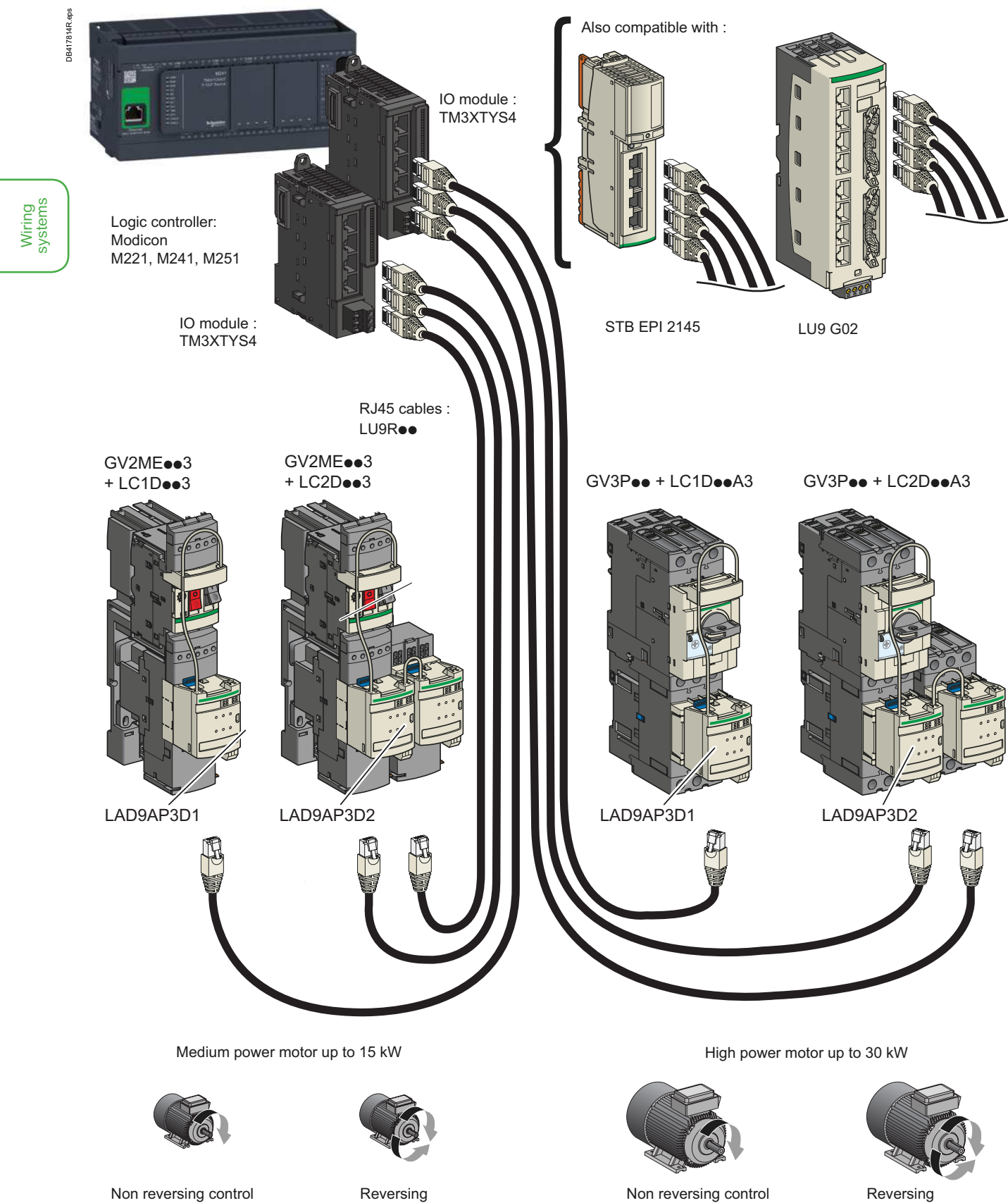


# TeSys

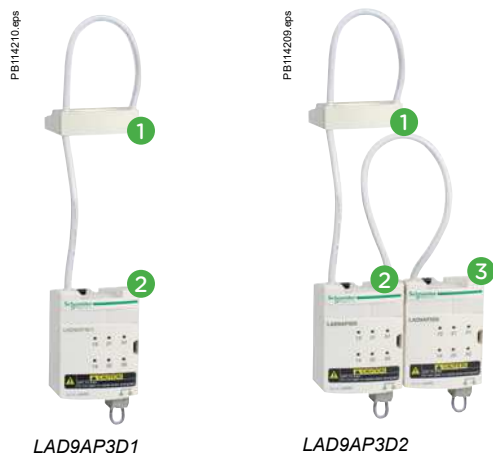
## TeSys LAD9 Control wiring system

### RJ45 wiring architecture

### Description







- 1 Plug connected to circuit breaker auxiliary contacts
- 2 3 Plug connected to contactor, to RJ45 and Aux. supply
- 1-3: 24 V DC control signal to the internal relay. It's contact sends the external source voltage to the contactor coil (KM1 or KM2).
- 7-8: circuit breaker status
- 5-8: contactor status
- The external link (red) can be replaced by an Emergency Stop pushbutton.

**Note:** GV2 circuit breaker + LC1D contactor assemblies must include the LAD311 back plate + LAD341 power connector.

## LAD9AP3●● Connection module for circuit breaker + contactors

### "Plug and play", for single or reverse motor starters

The connection module 1 + 2 provides a simple and safe solution for wiring control and monitoring terminals of a motor starter assembly. The connections to the terminals are grouped on a single (direct starter) or double (reverse starter) RJ45 connector. Thus, liaison to an IO module or splitter box is ensured by a straight preconnectorized RJ45 cable (LU9R●●).

### Remote control of contactor coil, of any voltage

- The LAD9AP3● "Electromechanical" version is adapted for contactors with coil of any voltage, (12 to 230 V AC, or 5 to 130 V DC) thanks to an internal relay ensuring the voltage interfacing. An external control supply is needed.
- The LAD9AP3D● "without relay" version is adapted for contactors with 24 V DC coil, the output voltage of the programmable logic controller IO or of the splitter box is directly applied to it.

### Compatibility

- TeSys GV2ME circuit breaker + TeSys D contactors ratings up to 18 A with spring type control terminals + LAD311 mounting plate + LAD341 power connection module.
- TeSys GV3P circuit breaker + LC1D●●● contactors up to 65 A with spring type control terminals.

#### 1 Circuit breaker plug:

- plugs directly into the auxiliary contacts terminals of a TeSys GV2ME or TeSys GV3P motor circuit breaker, in the location provided for the front-mounting block.

#### 2 and 3 Contactor block:

The contactor block ensures the connection to the coil and auxiliary contacts of the contactor. 2 contactor blocks are linked for the reverse starter assembly. Each one is fitted with a RJ45 connector.

The mechanical locking onto the top and bottom of the contactor ensures a perfect connection, whatever the operating conditions (vibrations, knocks, etc.)

### Control command pre-wiring components

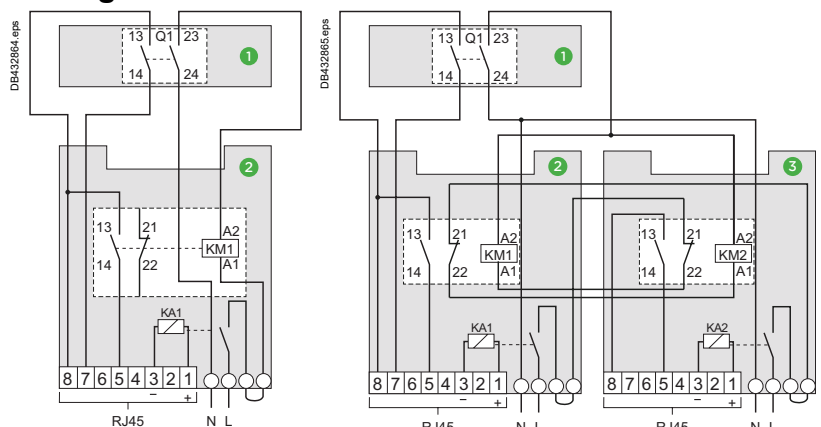
Description	TeSys D coil voltage	Type of coil control relay	Type of starter	Reference
Control connection modules	~ 12...250 V or ~ 5...130 V	Electromechanical	Direct	LAD9AP31
			Reversing	LAD9AP32
	~ 24 V	Without relay	Direct	LAD9AP3D1
			Reversing	LAD9AP3D2

### Connection cable

Between the control connection module and the splitter box  
LU9G02 or STBEPI2145

Connectors	Length (m)	Reference
2 x RJ45 connectors	0.3	LU9R03
	1	LU9R10
	3	LU9R30

## Design / Installation





# TeSys

## TeSys U Control wiring system

### RJ45 wiring architecture

### Description

DB417615.epa

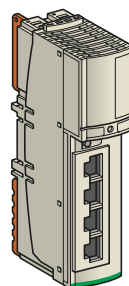
Wiring  
systems



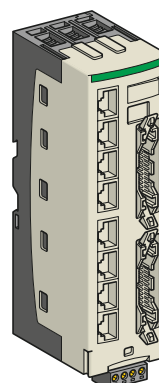
Logic controller:  
Modicon M221, M241, M251

IO module :  
TM3XTYS4

Also compatible with :



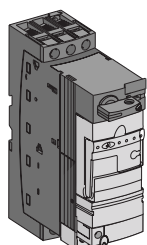
STB EPI 2145



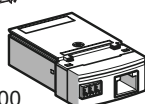
LU9 G02

RJ45 cables :  
LU9R●●

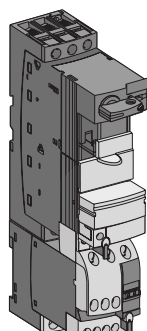
LUB12 power base  
LUC●● control unit



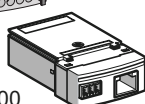
LUFC00



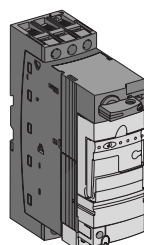
LU2B12 power base  
LUC●● control unit



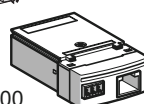
LUFC00



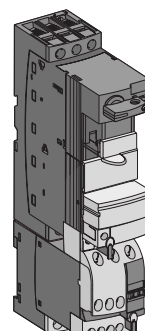
LUB32 power base  
LUC●● control unit



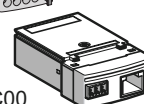
LUFC00



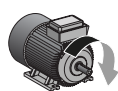
LU2B32 power base  
LUC●● control unit



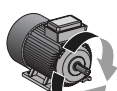
LUFC00



Small power motor up to 5,5 kW

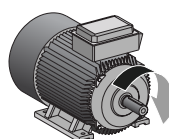


Non reversing control

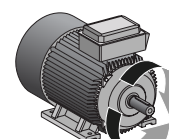


Reversing

Medium power motor up to 15 kW



Non reversing control



Reversing



"Plug and play", for single or reversing motor starters

The LUFC00 parallel connection module provides a simple and efficient solution for control and monitoring of a TeSys U direct or reverse motor starter.

Compact, fast cabling

The connection to the TeSys U power base is simply achieved by insertion of the module into it. The status and control signals are carried by a simple pre-connectorized RJ45 cable (LU9R●●) between an IO module or splitter box and TeSys U.

Features

- On / OFF / Reverse control (functions non provided with LUB12, 32, 38 power bases).
- Handle position, power contacts position monitoring (function provided with all power bases).

Compatibility

12, 32 or 38 A direct motor starters: LUB12, LUB32 or LUB38 power base + LUC●● control unit (coil code BL),  
LUB120, LUB320 or LUB380 power base + LU9N11C connector + LUC●● control unit (coil code BL)

12, 32 or 38 A reversing motor starters: LU2B12, LU2B32 or LU2B38 power base + LU9MRC connector + LUC●● control unit (coil code BL).



LUFC00



LU9BN11C



LU9MRC

TeSys U RJ45 connection module	
Designation	Commercial ref
1 Parallel wiring module	LUFC00

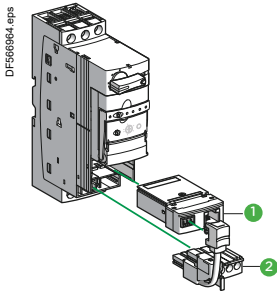
TeSys U coil connector	
Designation	Commercial ref
2 Pre wired coil connector for LUB120, LUB320 or LUB380 power base	LU9BN11C
3 Pre wired coil connector for LU2B12, LU2B32 or LU2B38 power base	LU9MRC

Design / Installation

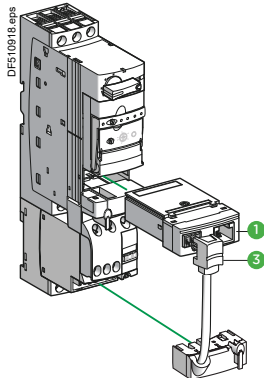
The LUFC00 parallel (RJ45) connection module acts as a connection interface for controlling the coil (except with LUB12, 32, 38) and the monitoring of the auxiliary contacts. As a necessary complement, a pre wired connector is needed for carrying the signal to the coil and collecting:

- the status of the protection device (OK / Alarm) with LU9BN11C,
- the electrical interlock contacts with LU9MRC.

As the "reversing" is higher than the "direct" power base, the LU9MRC link is longer than the LU9BN11C.



Direct motor starter  
(LUB120, 320, 380 power base).



Reversing motor starter  
(LU2B12, 32, 38 power base).







## Technical Data for Designers

### Contents

Power wiring systems for motor starter assemblies:

- > Dimensions (GV2 + LAD311 assembly).....B2/14
- > Dimensions (GV2G●●● busbars) .....B2/15

Power + Control wiring systems for motor starter assemblies:

- > Introduction.....B2/16
- > Characteristics.....B2/17
- > Dimensions .....B2/18

IO module, splitter box, for motor starters control circuits

- > Dimensions .....B2/19



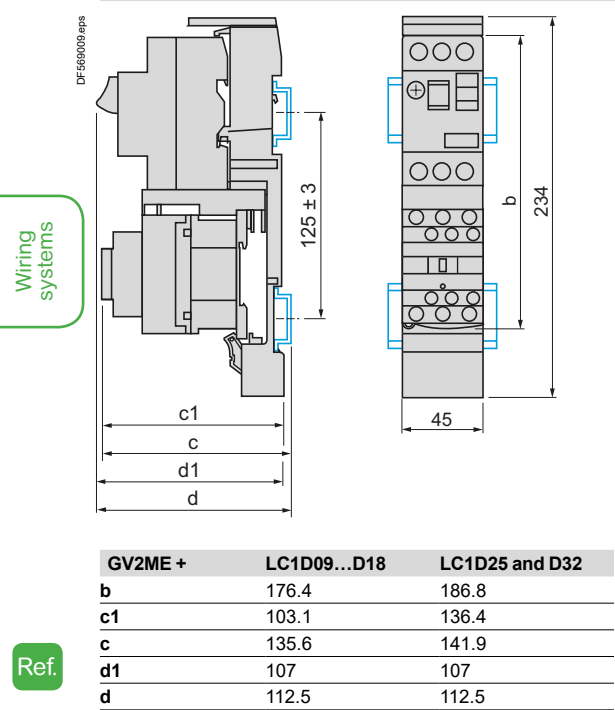
TeSys

TeSys LAD3 Power wiring system for motor starter assemblies

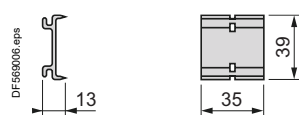
Dimensions

GV2AF4 + LAD311

Combination GV2ME + TeSys D contactor



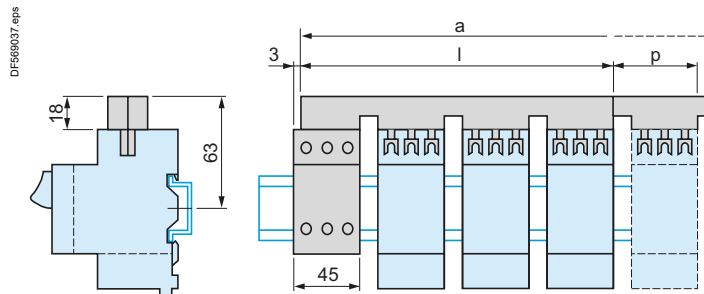
7.5 mm height compensation plate GV1F03





#### GV2ME, GV2P, GV2L and GV2LE

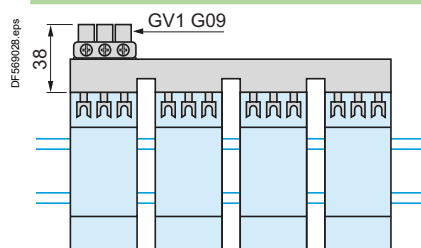
Sets of busbars GV2G445, GV2G454, GV2G472, with terminal block GV2G05



	l	p
GV2G445 (4 x 45 mm)	179	45
GV2G454 (4 x 54 mm)	206	54
GV2G472 (4 x 72 mm)	260	72

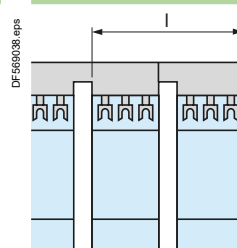
	a			
Number of tap-offs	5	6	7	8
GV2G445	224	269	314	359
GV2G454	260	314	368	422
GV2G472	332	404	476	548

#### Sets of busbars GV2G●●● with terminal block GV1G09

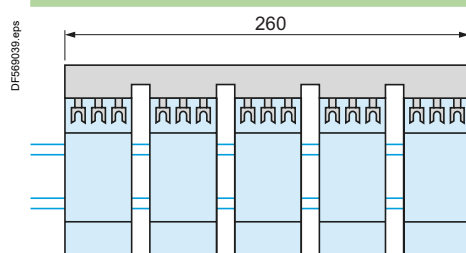


	l
GV2G245 (2 x 45 mm)	89
GV2G254 (2 x 54 mm)	98
GV2G272 (2 x 72 mm)	116

#### Sets of busbars GV2G245, GV2G254, GV2G272

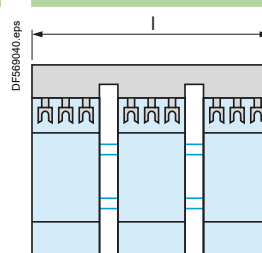


#### Sets of busbars GV2G554



	l
GV2G345 (3 x 45 mm)	134
GV2G354 (3 x 54 mm)	152

#### Sets of busbars GV2G345 and GV2G354

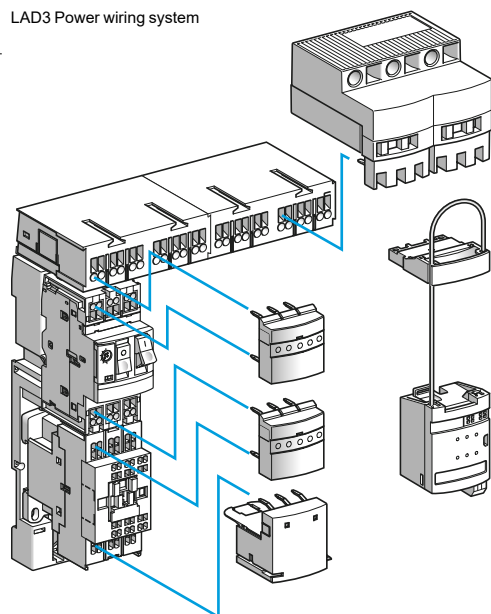




LAD3 Power wiring system

DF510533 eps

Wiring systems



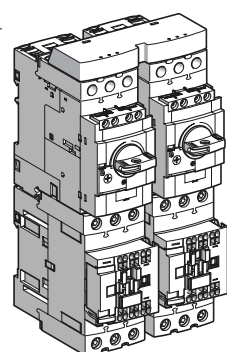
Motor starter with GV2ME circuit breakers

LAD9AP3D1 RJ45 control wiring module

Ref.



DF503851 eps



Motor starter with GV3P circuit breakers

LAD9AP3D1 RJ45 control wiring module

It is a modular system which standardises and simplifies setting up of motor starters with its pre-wired control and power circuits.

Installation of a motor starter is therefore quick, simple, safe and flexible. In addition, this system:

- enables the motor starter to be customised at a later date,
- reduces maintenance time and
- optimises panel space by reducing the number of terminals and intermediate interfaces and the amount of ducting.

### Wiring system for motor starters with spring terminals

#### Motor starters with TeSys GV2ME circuit breakers

- From 0 to 18 A max.,
- TeSys GV2ME circuit breakers combined with LC1D contactors from 9 to 25 A (spring terminal version),
- Pre-wired power and control connections.

#### Motor starters with TeSys GV3P circuit breakers

- From 9 to 65 A max.,
- TeSys GV3P circuit breakers combined with LC1D contactors from 40 to 65 A (spring terminal version),
- Pre-wired control connections only,
- For pre-wired power connections, use busbar sets from the TeSys D 40 to 65 A contactor range (see chapter B8).

This range comprises pre-wiring components for:

- the power circuits,
- the control circuits.

#### Power circuit pre-wiring components

(motor starters with TeSys GV2 circuit breakers only)

- a **power circuit connection kit** comprising, for each starter, a plate for mounting the contactor and the circuit breaker and two power connection modules,
- a **power splitter box** for 2 or 4 starters,
- an **upstream terminal block** for a power supply up to 60 A (16 mm<sup>2</sup>),
- an **outgoing terminal block** for connection of the motor power supply cables and the earth cables (6 mm<sup>2</sup>).

**Note:** with GV3 circuit breakers, no accessories are required for pre-wiring of the power circuit. The GV3P●● outgoing terminal block can be removed.

This circuit breaker is also sold with only one terminal block (reference: GV3P●●1).

#### Control circuit pre-wiring components

(motor starters with TeSys GV2 and GV3 circuit breakers)

- a **control circuit connection module** which plugs directly into the contactor and the circuit breaker on each starter. This module incorporates status and control data for this motor starter.
- a **parallel wiring module** which concentrates the data of each motor starter:
  - **HE10** connector, for centralised applications. Data is transmitted to the PLC via the Advantys Telefast pre-wired system.
  - **STB**, designed for decentralised automation architectures. This module is suitable for use in an Advantys STB configuration for connection to the PLC via a field bus.



## Characteristics

General environment				
Type of control connection module			LAD9AP3●●	
Standard				IEC 60439-1
Certifications				UL, CSA
Degree of protection	Conforming to IEC 60529			IP 40 (mounted assembly)
Resistance to incandescent wire	Conforming to IEC 60695-2-1	°C		960
Shock resistance	Conforming to IEC 60068-2-27			11 ms and 15 gn (half sine wave)
Vibration resistance	Conforming to IEC 60068-2-6 and BV/LR	gn		2...100 Hz: 4 and 3...100 Hz: 0.7
Resistance to electrostatic discharge	Conforming to IEC 61000-4-2			Level 3
Resistance to radiated fields	Conforming to IEC 61000-4-3	V/m		10 (26...1000 MHz)
Immunity to fast transient currents	Conforming to IEC 61000-4-4			Level 3
Surge withstand	Conforming to IEC 61000-4-5	kV		2 in common mode, 0.6 in differential mode Wave form: 1.2/50 µs - 8/20 µs
Immunity to radioelectric fields	Conforming to IEC 61000-4-6	V		10 (0.15...80 MHz)
Ambient air temperature	Operation in floor-standing enclosure	°C		-5...+60
	Operation in wall-mounted enclosure	°C		-5...+40
	Storage	°C		-40...+70
Space required around mounted assembly	For inserting cables and heat dissipation	mm		> 30
Degree of pollution				3
Assembly fixing (with TeSys GV2 circuit breakers only)				On 2 x 35 mm rails or with 2 x Ø5.5 mm screws on plate for GV2ME
Suitable wire c.s.a.	Voltage supply for power	Number of wires		3
		Flexible cable with cable end	mm²	16
		Flexible cable without cable end	mm²	25
		Solid cable	mm²	25
	Voltage supply for contactor coil control	Number of wires		2
		Flexible cable with cable end (max)	mm²	1.5
		Flexible cable without cable end (max)	mm²	2.5
		Solid cable (max)	mm²	2.5

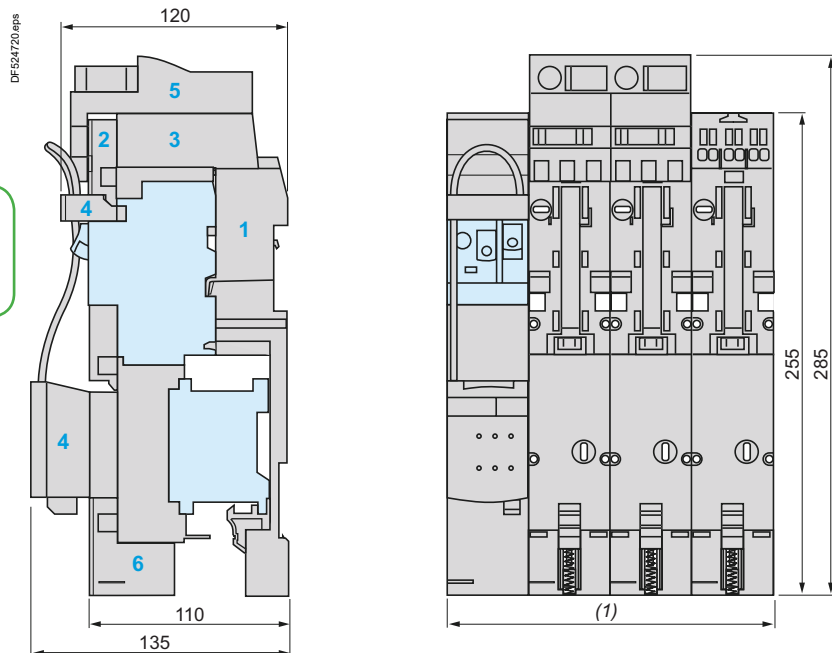
3-phase power circuit characteristics				
Maximum current	Per power supply	Conforming to IEC 60439-1	A	60 (single power supply to one or more sub-bases or splitter boxes)
	Per sub-base	Conforming to IEC 60439-1	A	60
GV2 operating limit				80 % of I <sub>max</sub> at 60 °C ambient temperature (see table on opposite page)
Maximum current per starter			A	18 (with an empty slot between two starters)
Insulation voltage			V	750
Operational voltage			V	690
U <sub>imp</sub>			kV	6
Rated operational frequency			Hz	50-60
Rated short-circuit current conditional I <sub>sc</sub> at 415 V		Conforming to IEC 60439-1	kA	50
Permissible short-time rating I <sub>cw</sub>		Conforming to IEC 60439-1	kA	9.1 (for 70 ms)

Control circuit characteristics			
Contactor coil control voltage		V	~ 12...250 (with interface relay)
		V	~ 5...24 (without interface relay)
		V	~ 5...130 (with interface relay)



#### TeSys LAD3 Power + LAD9 Control wiring systems for spring terminals

Mounted assembly, with TeSys GV2ME circuit breakers and TeSys D contactors

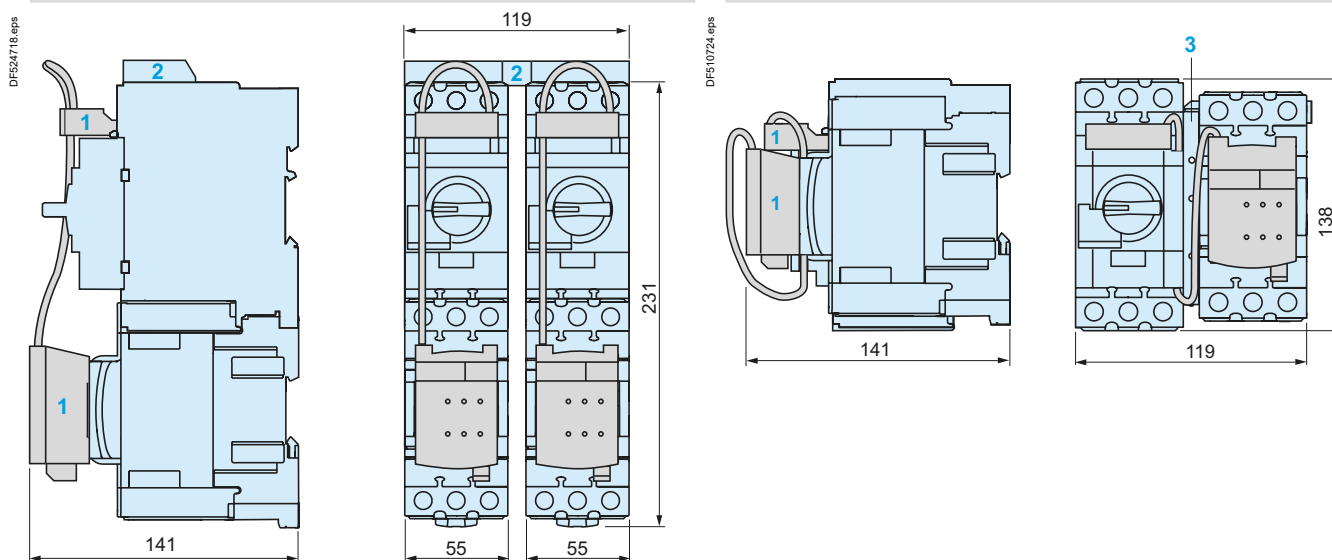


#### LAD9 Control wiring systems for spring terminals

Mounted assembly with TeSys GV3P circuit breakers and TeSys D contactors (LC1D40A3... LC1D65A3)

Vertical mounting

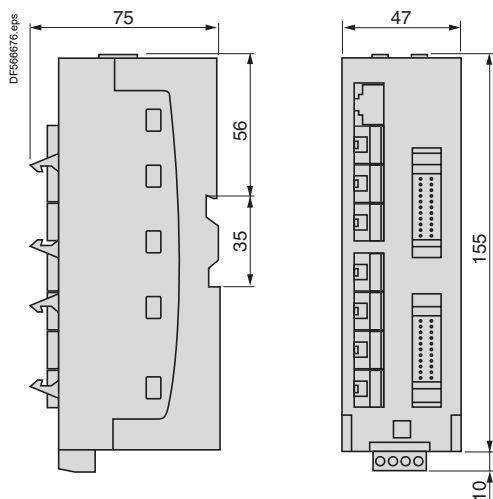
Side by side mounting



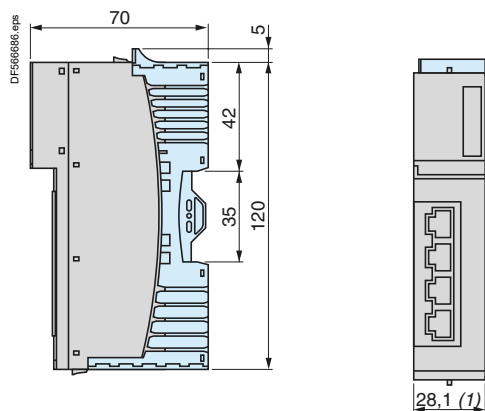


TeSys  
LU9G02 RJ45 splitter box  
Dimensions

Parallel RJ45 wiring modules  
Splitter box LU9G02



Parallel wiring module Advantys STBEPI2145



(1) Dimension to be multiplied by the number of **STBEPI2145** modules present in the configuration.

Wiring  
systems

Ref.

i

■







Door mounting isolation switch - Mini-Vario - Vario			
Type of product	Range		Pages
Switch-disconnectors Mini-Vario	Up to 12 or 20 A		B3/2
Switch-disconnectors, high performance applications Vario	From 12 to 175 A		B3/6
Accessories Mini-Vario and Vario			B3/8

Switch-  
disconnectors

Technical Data for Designers	B3/17
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PE121282.eps

VCDN20

Switch-disconnectors



PE121283.eps

VCCDN20



PE119284.eps

VBDN20

## TeSys Mini-Vario Switch-disconnectors for standard applications

- 3-pole rotary switch-disconnectors, 12 to 20 A
- Marking on operator  $\circ \downarrow$ .
- Padlockable operating handle (padlocks not supplied).
- Degree of protection IP 65.

### Main and Emergency stop switch-disconnectors for door mounting

Operator			lth	Reference
Handle	Front plate mm	Fixing mm		
Red, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 60 x 60	Ø22.5	12	VCDN12
			20	VCDN20

### Main and Emergency stop switch-disconnectors for mounting at back of an enclosure <sup>(1)</sup>

Operator			lth	Reference
Handle	Front plate mm	Fixing mm		
Red, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 60 x 60	Ø22.5	12	VCCDN12
			20	VCCDN20

### Main switch-disconnectors for door mounting

Operator			lth	Reference
Handle	Front plate mm	Fixing mm		
Black, padlockable with up to 3 padlocks (Ø4 to Ø8)	Black 60 x 60	Ø22.5	12	VBDN12
			20	VBDN20

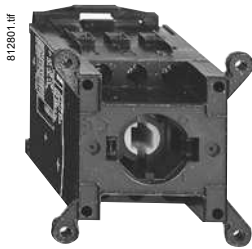
<sup>(1)</sup> Switches supplied with a shaft extension VZN17 and a door interlock plate KZ32 (see page B3/5).



# TeSys

## TeSys Mini-Vario Switch-disconnectors

### Product references



VN20



VZN11



VZN14



VZN05



VZN26



VZN08

### TeSys Mini-Vario Switch-disconnectors for standard applications

Switch bodies		
Description	Rating A	Reference
3-pole switch-disconnectors	12	VN12
	20	VN20

Add-on modules		
Description	Rating A	Reference
Main pole modules	12	VZN12
	20	VZN20
Neutral pole module with early make and late break contacts	12 and 20	VZN11
Earthing module	12 and 20	VZN14
Auxiliary contact block modules	1 N/O late make contact	VZN05
	1 N/C early break contact	VZN06
Input terminal protection shrouds	For add-on pole modules or auxiliary contact block modules (single-pole shroud)	VZN26
	For switch bodies (3-pole shroud)	VZN08

### Maximum number of add-on modules that can be fitted on a switch body

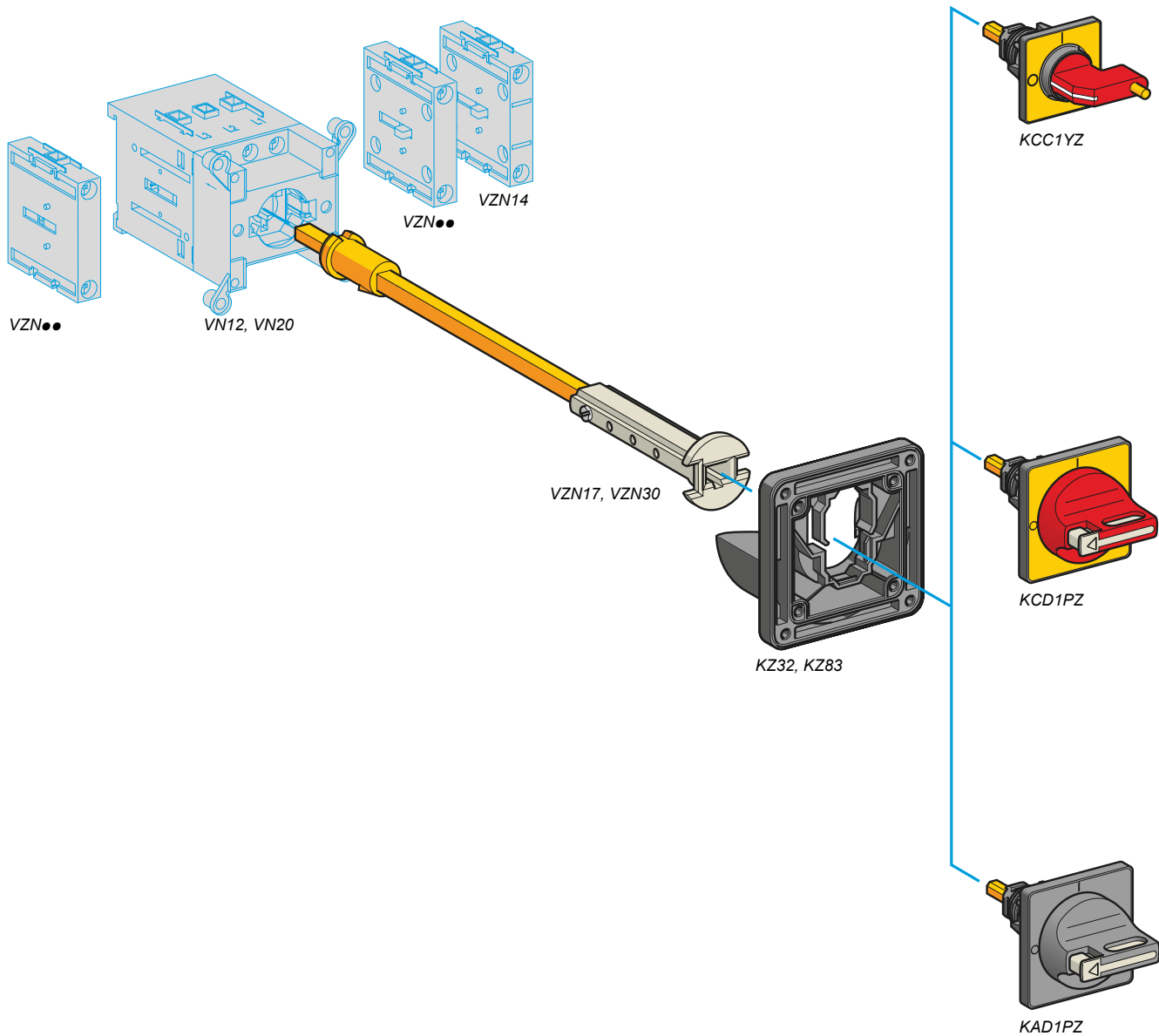
VZN12 or VZN20	+	VN12	+	VZN12 or VZN20
		or		
	or	or		VZN11 + VZN14
		VN20		or
VZN05 or VZN06				VZN05 or VZN06

Switch-disconnectors






Switch-  
disconnectors





## TeSys Mini-Vario Switch-disconnectors for standard applications

- Degree of protection IP 65.
- Marking on operator .
- Padlockable operating handle (padlocks not supplied).
- Operator fixing by 1 Ø22.5 hole; for other operators see pages B3/11 and B3/13.
- For other accessories and empty enclosures, see pages B3/14, B3/15 and chapter A1.

### Operators for main and Emergency stop switch-disconnectors

Handle	Front plate mm	Reference
Red, padlockable with 1 padlock (Ø4 to Ø6)	Yellow 45 x 45	KCC1YZ
Red, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 60 x 60	KCD1PZ

### Operators for main switch-disconnectors

Handle	Front plate mm	Reference
Black, padlockable with up to 3 padlocks (Ø4 to Ø8)	Black 60 x 60	KAD1PZ

### Accessories for door interlocking

For rear fixing switch-disconnectors mounted at the back of an enclosure, in addition to a direct operator

Description	Front plate mm	Distance enclosure back/door mm	Sold in lots of	Unit reference
Shaft extensions	–	300...330	1	VZN17
		400...430	1	VZN30
Door interlock plate	45 x 45 or 60 x 60	–	5	KZ32
Plate for door mounting	45 x 45 or 60 x 60	–	5	KZ83





## TeSys Vario Switch-disconnectors for high performance applications

- 3-pole rotary switch-disconnectors, 12 to 175 A
- Marking on operator  $\circ \downarrow$ .
- Padlockable operating handle (padlocks not supplied).
- Degree of protection IP 65.



VCF0



VCF5



VCCF0

### Main and Emergency stop switch-disconnectors for door mounting

Handle	Front plate mm	Fixing	Rating A	Reference	Weight kg
Red, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 60 x 60	Ø22.5	12	VCD02	0.215
			20	VCD01	0.215
			25	VCD0	0.215
			32	VCD1	0.215
			40	VCD2	0.215
		4 screws	12	VCF02	0.250
			20	VCF01	0.250
			25	VCF0	0.250
			32	VCF1	0.250
			40	VCF2	0.250
			63	VCF3	0.560
			80	VCF4	0.560
Red, long, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 90 x 90	4 screws	125	VCF5	1.200
			175	VCF6	1.200

### Main and Emergency stop switch-disconnectors for mounting at back of an enclosure <sup>(1)</sup>

Handle	Front plate mm	Fixing	Rating A	Reference	Weight kg
Red, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 60 x 60	Ø22.5	12	VCCD02	0.392
			20	VCCD01	0.392
			25	VCCD0	0.392
			32	VCCD1	0.392
			40	VCCD2	0.392
		4 screws	12	VCCF02	0.527
			20	VCCF01	0.527
			25	VCCF0	0.527
			32	VCCF1	0.527
			40	VCCF2	0.527
			63	VCCF3	0.440
			80	VCCF4	0.680
Red, long, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 90 x 90	4 screws	125	VCCF5	1.320
			175	VCCF6	1.320

<sup>(1)</sup> Unit supplied with a shaft extension **VZN17** or **VZ18** and a door interlock plate **KZ32** or **KZ74** (see page B3/14).



### TeSys Vario Switch-disconnectors for high performance applications

- 3-pole rotary switch-disconnectors, 12 to 175 A
- Marking on operator  $\circ \downarrow$ .
- Padlockable operating handle (padlocks not supplied).
- Degree of protection IP 65.



VBD01



VBF4



VVE1

#### Main switch-disconnectors for door mounting

Handle	Front plate mm	Fixing	Rating A	Reference	Weight kg
Black, padlockable with up to 3 padlocks (Ø4 to Ø8)	Black 60 x 60	Ø22.5	12	VBD02	0.215
			20	VBD01	0.215
			25	VBD0	0.215
			32	VBD1	0.215
			40	VBD2	0.215
		4 screws	12	VBF02	0.250
			20	VBF01	0.250
			25	VBF0	0.250
			32	VBF1	0.250
			40	VBF2	0.250
			63	VBF3	0.560
Black, long, padlockable with up to 3 padlocks (Ø4 to Ø8)	Black 90 x 90	4 screws	125	VBF5	1.200
			175	VBF6	1.200

#### Main and Emergency stop switch-disconnectors

##### For mounting in an enclosure or for modular distribution boards

Handle	Front plate mm	Fixing	Rating A	Reference	Weight kg
Red, padlockable with 1 padlock (Ø4 to Ø6)	Yellow 45 x 45	4 screws	25	VVE0	0.250
			32	VVE1	0.250
			40	VVE2	0.250
			63	VVE3	0.530
			80	VVE4	0.530

#### Main switch-disconnectors

##### For mounting in an enclosure or for modular distribution boards

Handle	Front plate mm	Fixing	Rating A	Reference	Weight kg
Black, not padlockable	Black 45 x 45	4 screws	25	VVD0	0.250
			32	VVD1	0.250
			40	VVD2	0.250
			63	VVD3	0.560
			80	VVD4	0.560



## TeSys Vario Switch-disconnectors for high performance applications

### Switch bodies

Description	Rating A	Reference
3-pole switch-disconnectors <sup>(1)</sup>	12	V02
	20	V01
	25	V0
	32	V1
	40	V2
	63	V3
	80	V4
	125	V5
	175	V6

### Add-on modules

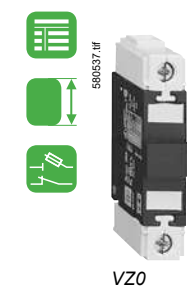
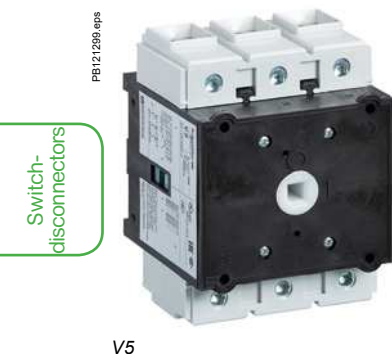
Description	Rating A	Reference
Main pole modules	12	VZ02
	20	VZ01
	25	VZ0
	32	VZ1
	40	VZ2
	63	VZ3
	80	VZ4
Neutral pole modules with early make and late break contacts <sup>(1)</sup>	12 to 40	VZ11
	63 to 80	VZ12
	125 and 175	VZ13
Earthing modules	12 to 40	VZ14
	63 and 80	VZ15
	125 and 175	VZ16

### Auxiliary contact block modules

Description	Type	Reference
Auxiliary contact block modules with 2 auxiliary contacts	N/O + N/C <sup>(2)</sup>	VZ7
	N/O + N/O	VZ20

<sup>(1)</sup> Protection shrouds are available if required: see page B3/14.

<sup>(2)</sup> Late make N/O, early break N/C contacts





## TeSys Vario Switch-disconnectors for high performance applications

Maximum number of add-on modules that can be fitted  
on a switch body

1 add-on module on each side of the switch body

VZ7 or VZ20	+	V0●	+	VZ7 or VZ20	VZ7	+		+	VZ7
or				or	or				or
VZ11 or VZ12	+	V0	+	VZ11 or VZ12	VZ20	+		+	VZ20
or				or	or				or
VZ14 or VZ15	+		+	VZ14 or VZ15	VZ13	+		+	VZ13
or				or	or				or
VZ0●/VZ0 to VZ4	+		+	VZ0●/VZ0 to VZ4	VZ16	+		+	VZ16

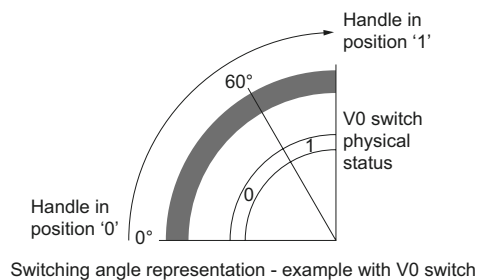
Switch-  
disconnectors

2 add-on modules on each side of the switch body

VZ0●	+	VZ0●	+	V0●	+	VZ0●	+	VZ7	or	VZ20	or	VZ11	or	VZ14
VZ0	+	VZ0	+	V0	+	VZ0	+	VZ7	or	VZ20	or	VZ11	or	VZ14
VZ1	+	VZ1	+	V1	+	VZ1	+	VZ7	or	VZ20	or	VZ11	or	VZ14
VZ2	+	VZ2	+	V2	+	VZ2	+	VZ7	or	VZ20	or	VZ11	or	VZ14
VZ3	+	VZ3	+	V3	+	VZ3	+	VZ7	or	VZ20	or	VZ12	or	VZ15
VZ4	+	VZ4	+	V4	+	VZ4	+	VZ7	or	VZ20	or	VZ12	or	VZ15

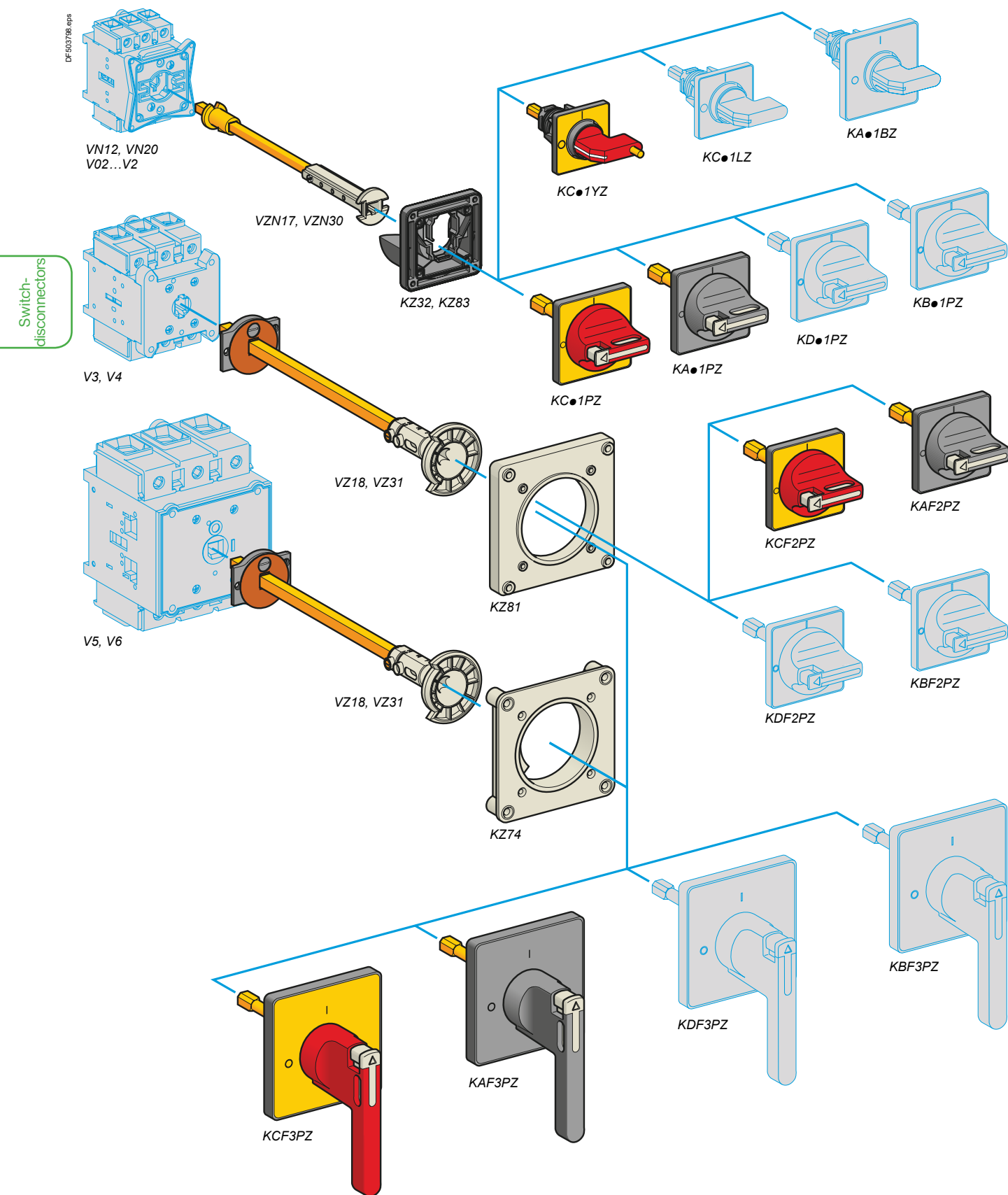
**Note:** The add-on modules mounted next to the switch body are main pole modules.  
Maximum of 3 main pole modules per switch body.

## Auxiliary switch switching angles




		0: contact open 1: contact close			
Handle travel 0 > 1		0°	30°	60°	90°
3-pole switch-disconnectors V02 / V01 / V0 / V1 / V2 / V3 / V4 / V5 / V6				60°	
Main pole modules VZ02 / VZ01 / VZ0 / VZ1 / VZ2 / VZ3 / VZ4			0	60°	1
Neutral pole modules with early make and late break contacts VZ11 / VZ12 / VZ13			0	45°	1
Auxiliary contact block modules with 2 auxiliary contacts (N/0+N/C) VZ7				75°	
Late make N0 and earlier break NC (Early break N0 and late make NC for travel 1-0)		N/0	1	0	1
		N/C	1	0	
			20°		
Auxiliary contact block modules with 2 auxiliary contacts (N/0+N/C) VZ20				60°	
			0	60°	1
			0		1
				60°	







- Marking on operator .
- Padlockable operating handle (padlocks not supplied).
- Degree of protection IP 65.

### Handles and front plates for main and Emergency stop switch-disconnectors

For switch body	Operator Handle	Front plate		Reference
		Dimensions	Fixing	
		mm		
VN12, VN20 V02...V2	Red, padlockable with 1 padlock (Ø4 to Ø6)	Yellow 45 x 45	Ø22.5	<b>KCC1YZ</b>
			4 screws	<b>KCE1YZ</b>
	Red, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 60 x 60	Ø22.5	<b>KCD1PZ</b>
			4 screws	<b>KCF1PZ</b>
V3 and V4	Red, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 60 x 60	4 screws	<b>KCF2PZ</b>
V5 and V6	Red, long, padlockable with up to 3 padlocks (Ø4 to Ø8)	Yellow 90 x 90	4 screws	<b>KCF3PZ <sup>(1)</sup></b>

### Handles and front plates for main switch-disconnectors

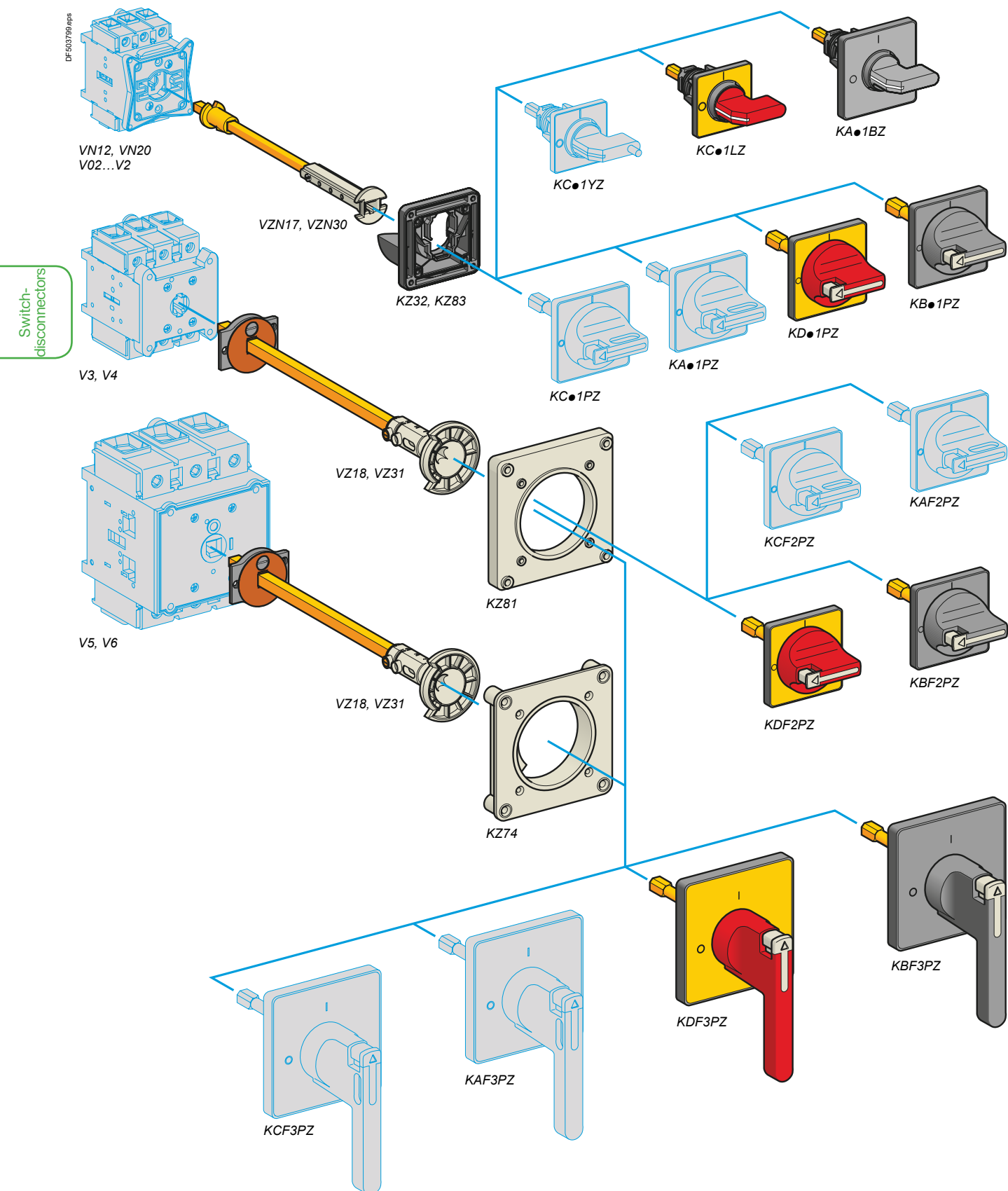
For switch body	Operator Handle	Front plate		Reference
		Dimensions	Fixing	
		mm		
VN12, VN20 V02...V2	Black, padlockable with up to 3 padlocks (Ø4 to Ø8)	Black 60 x 60	Ø22.5	<b>KAD1PZ</b>
			4 screws	<b>KAF1PZ</b>
V3 and V4	Black, padlockable with up to 3 padlocks (Ø4 to Ø8)	Black 60 x 60	4 screws	<b>KAF2PZ</b>
V5 and V6	Black, long, padlockable with up to 3 padlocks (Ø4 to Ø8)	Black 90 x 90	4 screws	<b>KAF3PZ <sup>(1)</sup></b>

<sup>(1)</sup> For door mounting of 63 and 80 A switch-disconnectors, adapter plate **KZ106** must be ordered separately (see page B3/14).


Switch-disconnectors









- Marking on operator .
- Degree of protection IP 65.

#### Handles and front plates for Emergency stop switch-disconnectors

For switch body	Operator Handle	Front plate		Reference
		Dimensions	Fixing	
		mm		
VN12, VN20 V02...V2	Red, not padlockable	Yellow 45 x 45	Ø22.5	<b>KCC1LZ</b>
			4 screws	<b>KCE1LZ</b>
		Yellow 60 x 60	Ø22.5	<b>KDD1PZ</b>
			4 screws	<b>KDF1PZ</b>
V3 and V4	Red, long, not padlockable	Yellow 60 x 60	4 screws	<b>KDF2PZ</b>
V5 and V6	Red, long, not padlockable	Yellow 90 x 90	4 screws	<b>KDF3PZ <sup>(1)</sup></b>

#### Handles and front plates for switch-disconnectors

For switch body	Operator Handle	Front plate		Reference
		Dimensions	Fixing	
		mm		
VN12, VN20 V02...V2	Black, not padlockable	Black 45 x 45	Ø22.5	<b>KAC1BZ</b>
			4 screws	<b>KAE1BZ</b>
		Black 60 x 60	Ø22.5	<b>KBD1PZ</b>
			4 screws	<b>KBF1PZ</b>
V3 and V4	Black, not padlockable	Black 60 x 60	4 screws	<b>KBF2PZ</b>
V5 and V6	Black, not padlockable	Black 90 x 90	4 screws	<b>KBF3PZ <sup>(1)</sup></b>

<sup>(1)</sup> For door mounting of 63 and 80 A switch-disconnectors, adapter plate **KZ106** must be ordered separately (see next page).

Switch-disconnectors

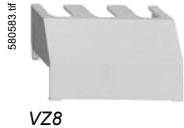




# TeSys

## TeSys Mini-Vario and Vario accessories

### Product references



VZ8



VZ26



VZ29

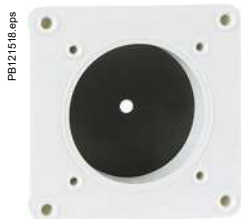
Switch-disconnectors



VZ31



KZ32



KZ81

#### Input terminal protection shrouds

Description	For use on	Reference
For switch bodies (3-pole shroud)	V02...V2	<b>VZ8</b>
	V3 and V4	<b>VZ9</b>
	V5 and V6	<b>VZ10</b>
For add-on pole modules (single-pole shroud)	VZ02...VZ2, VZ11, VZ14	<b>VZ26</b>
	VZ3, VZ4, VZ12, VZ15	<b>VZ27</b>
	VZ13, VZ16	<b>VZ28</b>
For contact blocks with 2 auxiliary contacts	–	<b>VZ29</b>

#### Components for door interlocking

For rear fixing switch-disconnectors mounted at the back of an enclosure, in addition to a direct operator

Description	For use on	Distance enc. back/door mm	Sold in lots of	Unit reference
Shaft extensions	VN12, VN20 V02...V2	300...330	1	<b>VZN17 <sup>(1)</sup></b>
		400...430	1	<b>VZN30 <sup>(1)</sup></b>
	V02...V2	300...330	1	<b>VZ17</b>
		400...430	1	<b>VZ30</b>
	V3 and V4	300...320	1	<b>VZ18</b>
		400...420	1	<b>VZ31</b>
Door interlock plates	VN12, VN20 V02...V2	–	5	<b>KZ32</b>
		–	5	<b>KZ74</b>
	V3...V6	–	5	<b>KZ32</b>
		–	5	<b>KZ74</b>

Description	For use on	Front plate dimensions mm	Sold in lots of	Unit reference
Plates for door mounting of handles with 4 screw fixing	VN12, VN20 V02...V2	45 x 45 or 60 x 60	5	<b>KZ83</b>
	V3...V6	60 x 60 or 90 x 90	5	<b>KZ81</b>
Adapter plate for switch-disconnectors	V3 and V4	90 x 90	5	<b>KZ106</b>

<sup>(1)</sup> Can be used with V02 to V2 switches.



# TeSys

## TeSys Mini-Vario and Vario accessories

### Product references



KZ15



KZ67



Z01

Accessories for operators				
Description	For use on	Front plate dimensions mm	Sold in lots of	Unit reference
Legend holder with silver coloured blank legend plate	Front plate	45 x 45	5	KZ13
		60 x 60	5	KZ15
		90 x 90	5	KZ103
Legend holders without legend plate	Front plate	45 x 45	20	KZ14
		60 x 60	10	KZ16
		90 x 90	5	KZ101
Silver coloured blank legend plates for engraving by customer	KZ14	—	20	KZ76
	KZ16	—	10	KZ77
	KZ101	—	5	KZ100
Seals	VN12, VN20	45 x 45	5	KZ65
	V02...V2	60 x 60	5	KZ66
	V3 and V4	60 x 60	5	KZ62
	V3...V6	90 x 90	5	KZ67
Tightening tool	For operators with Ø22.5 fixing	—	5	Z01

Switch-disconnectors









## Technical Data for Designers

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> Schemes ..... B3/23

#### Vario:

> Dimensions ..... B3/24 to B3/25

> Schemes ..... B3/25



# TeSys

## TeSys Mini-Vario, Vario Switch-disconnectors

### Characteristics

#### Characteristics

##### Environment

Switch type (bare type)		VN12 VZN12	V02 VZ02	VN20 VZN20	V01 VZ01	V0 VZ0	VVD0 VVE0	V1 VZ1	VVD1 VVE1
Conforming to standards		IEC/EN 60947-3 and UL/CSA 60947-4-1							
Product certifications		UL, CSA	UL, CSA, DNV-GL, CCC, IEC	UL, CSA	UL, CSA, DNV-GL, IEC, EAC, CCC <sup>(1)</sup>				
Degree of protection with protection shroud		IP 20 conforming to IEC 60529							
Ambient air temperature	° C	-20...+50							
Flame resistance	° C	960 conforming to IEC 60695-2-11							
Shock resistance 1/2 sine wave = 11ms conforming to IEC60068-2-27	gn	15	30	15	30				
Vibration resistance 10...150 Hz conforming to IEC 60068-2-6	gn	5	1						

##### Electrical characteristics, a.c. operation

Switch type (bare type)		VN12 VZN12	V02 VZ02	VN20 VZN20	V01 VZ01	V0 VZ0	VVD0 VVE0	V1 VZ1	VVD1 VVE1
Rated operational voltage (Ue)	V	690							
Rated impulse withstand voltage (Uimp)	kV	6	8	6	8				
Conventional thermal currents in free air (Ith) and rated uninterrupted (Iu)	A	12		20		25		32	
Conventional thermal current in enclosure (Ithe)	A	10		16		20		25	
Power dissipation per AC-23A pole for the above operational currents	W	–				1.25		2	
	AC-21A	–				3.2		5	
Rated operational power and current	AC-21A/22A	230...690 V	A	12		20		25	32
	AC-23A	230 V	A/kW	10.6/3		14/4		19.7/5.5	
		240 V	A/kW	10.6/3		14/4		19.9/5.5	18.9/5.5
		400 V	A/kW	8.1/4		11/5.5		14.5/7.5	21.8/11
		415 V	A/kW	8.1/4		11/5.5		14/7.5	21/11
		500 V	A/kW	8.9/5.5		11.9/7.5		16.7/11	
		690 V	A/kW	8.6/7.5		12.3/11		17.5/15	
Rated operational power	AC -3	230/240 V	kW	1.5		3		4	
		400/415 V	kW	3		4		5.5	7.5
		500 V	kW	4		5.5		7.5	
		690 V	kW	4	5.5		7.5	11	
Intermittent duty class		30							
Characteristics in normal operating conditions	Rated making capacity AC-21A/22A/23A (I rms)	A/ 400 V	120		200		250		320
	Rated breaking capacity AC-21A/22A/23A (I rms)	A/ 400 V	120		200				250
Short-circuit characteristics	Permissible rms short time rating (Icw)	A/ 400V/1s	140	300	140	300			384
	Rated making capacity under short-circuit conditions (Icm) I peak	kA/ 400 V	0.5	1	0.5	1			
	Rated conditional short-circuit current (I rms) with aM/gG fuses	kA/ 400 V	6	10	6	10			
		A	12		20		25		35

<sup>(1)</sup> CCC: except for VVD, VVE switches.

References:  
page B3/3

Dimensions:  
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V2 VZ2	VVD2 VVE2	V3 VZ3	VVD3 VVE3	V4 VZ4	VVD4 VVE4	V5	V6	VZ7 VZ20	VZN05 VZN06
IEC/EN 60947-3 and UL/CSA 60947-4-1								IEC/EN 60947-5-1, UL/CSA 60947-5-1	

UL, CSA, DNV-GL, IEC, EAC, CCC <sup>(1)</sup>

IP 20 conforming to IEC 60529

-20...+50

960 conforming to IEC 60695-2-11

30	–
1	–

V2 VZ2	VVD2 VVE2	V3 VZ3	VVD3 VVE3	V4 VZ4	VVD4 VVE4	V5	V6	VZ7 VZ20	VZN05 VZN06
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690

8						6
40	63	80	125	175	12	12
32	50	63	100	140	10	10
2.4	4.2	5.1	7.5	11	–	
5.4	6.4	12.5	15	25	–	
40	63	80	125	160	le/AC-15	
25.8/7.5	50.3/15	61.2/18.5	71.9/22	96.6/30	6 A	
24.8/7.5	48.2/15	58.5/18.5	68/22	92.7/30	6 A	
29/15	41.5/22	57/30	68.5/37	83/45	4 A	
28/15	40/22	55/30	66/37	80/45	4 A	
28.5/18.5	44/30	54/37	64.5/45	79/55	2 A	
17.5/15	25/22	33/30	42/37	49/45	1 A	
5.5	11	15	22	30	–	
11	18.5	22	30	37	–	
15	22	30	37	45	–	
11	18.5		30	37	–	
30					–	
400	630	800	1250	1750	–	
320	500	640	1000	1400	–	
480	756	960	1500	2100	–	
1	2.1		2.8		–	
10					1	
50	63	80	125	200	16	16

<sup>(1)</sup> CCC: except for VVD, VVE switches.

References:  
page B3/3


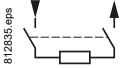
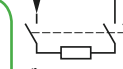
Dimensions:  
page B3/22

Schemes:  
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## Characteristics

## Electrical characteristics, d.c. operation

Switch type (bare type)				VN12 VZN12	V02 VZ02	VN20 VZN20	V01 VZ01	V0 VZ0	VVD0 VVE0	V1 VZ1	VVD1 VVE1
   Switch-disconnectors	Rated operational current DC-1 (L/R = 1ms)	24 V	1 contact	A	12	20		25		32	
			2 contacts	A	12	20		25		32	
			3 contacts	A	12	20		25		32	
		48 V	1 contact	A	12	20		25		32	
			2 contacts	A	12	20		25		32	
			3 contacts	A	12	20		25		32	
		60 V	1 contact	A	12	20		25		32	
			2 contacts	A	12	20		25		32	
			3 contacts	A	12	20		25		32	
		110 V	1 contact	A	1.5	2		9		10	
			2 contacts	A	8	10		12		16	
			3 contacts	A	12	20		25		32	
Ref.	Rated operational current DC-2 to DC-5 (L/R = 1ms)	24 V	1 contact	A	12	20		25		32	
			2 contacts	A	12	20		25		32	
			3 contacts	A	12	20		25		32	
		48 V	1 contact	A	12	20		25		32	
			2 contacts	A	12	20		25		32	
			3 contacts	A	12	20		25		32	
		60 V	1 contact	A	10	14		16		20	
			2 contacts	A	12	20		25		32	
			3 contacts	A	12	20		25		32	
		110 V	1 contact	A	1.5	2		2.5		3	
			2 contacts	A	3	4		5		6	
			3 contacts	A	12	20		25		32	
		220 V	1 contact	A	0.4	0.5		0.5		0.8	
			2 contacts	A	1.4	1.5		1.5		2	
			3 contacts	A	1	2		3		4	
		250 V	1 contact	A	0.3	0.4		0.5		0.8	
			2 contacts	A	0.4	0.6		0.8		1	
			3 contacts	A	1.2	2.4		1.6		2	

## Other characteristics

Switch type (bare type)				VN12 VZN12	V02 VZ02	VN20 VZN20	V01 VZ01	V0 VZ0	VVD0 VVE0	V1 VZ1	VVD1 VVE1
Mechanical durability (millions of operating cycles)				0.05	0.1	0.05	0.1				
Electrical durability in cat. AC-21 (millions of operating cycles)				0.05	0.1	0.05	0.1				
Electrical durability in cat. DC-1 to 5 (operating cycles)				30000							
Suitable for isolation				Yes							
Cabling	Flexible cable + cable end	mm <sup>2</sup>	4	6	4	6					
	Solid cable	mm <sup>2</sup>	4	10	4	10					
Tightening torque				N.m	0.7	2.1	0.7	2.1			



V2 VZ2	VVD2 VVE2	V3 VZ3	VVD3 VVE3	V4 VZ4	VVD4 VVE4	V5	V6	VZ7 VZ20	VZN05 VZN06
40		63		80		125	175	8 (le/DC-1)	
40		63		80		125	175	–	
40		63		80		125	175	–	
40		63		80		125	175	8 (le/DC-1)	
40		63		80		125	175	–	
40		63		80		125	175	–	
35		40		50		60	70	4 (le/DC-1)	
40		63		80		125	175	–	
40		63		80		125	175	–	
12		20		25		30	37	2 (le/DC-1)	
20		63		80		125	175	–	
40		63		80		125	175	–	
4		6		8		12	15	1 (le/DC-1)	
14		25		30		40	50	–	
25		30		40		80	100	–	
2		4		5		3	10	0.8 (le/DC-1)	
12		20		25		30	40	–	
20		30		40		50	61	–	
40		63		80		125	175	–	
40		63		80		125	175	–	
40		63		80		125	175	–	
40		63		80		125	175	–	
40		63		80		125	175	–	
40		63		80		125	175	–	
25		40		50		60	70	–	
40		63		80		125	175	–	
40		63		80		125	175	–	
5		6		8		10	12	–	
8		10		20		22	24	–	
40		50		63		70	80	–	
1		1.5		2		2.2	2.4	–	
3		4		6		7	8	–	
7		10		15		16	13	–	
1		1.2		1.5		1.6	1.8	–	
2		3		6		7	8	–	
6		8		10		12	14	–	
V2 VZ2	VVD2 VVE2	V3 VZ3	VVD3 VVE3	V4 VZ4	VVD4 VVE4	V5	V6	VZ7 VZ20	VZN05 VZN06
0.1		0.03						0.1	0.05
0.1		0.03						0.1 (AC-15)	0.05
30000								30000 (DC-1)	
Yes								–	
6		16				70		2 x 0.75...1.5	
10		25				95		2 x 1...2.5	
2.1		4				22.6		0.7	

References:  
page B3/3

Dimensions:  
page B3/22

Schemes:  
page B3/23



# TeSys

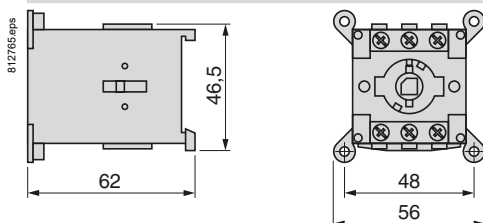
## TeSys Mini-Vario Switch-disconnectors

### Dimensions, mounting

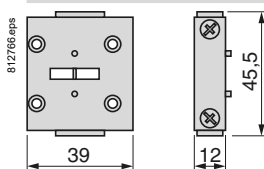
#### Dimensions

##### Switch-disconnectors

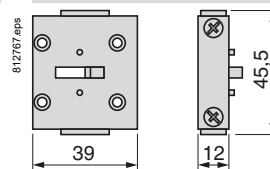
Switch bodies VN12, VN20



Add-on modules VZN12, VZN20



Add-on modules VZN11, VZN14 VZN05 and VZN06

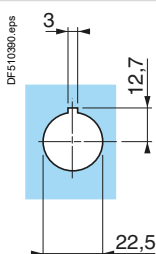
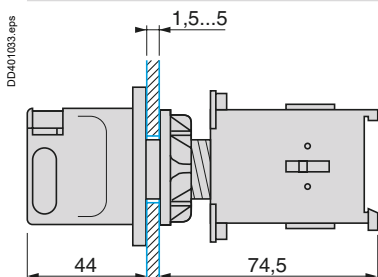


#### Mounting

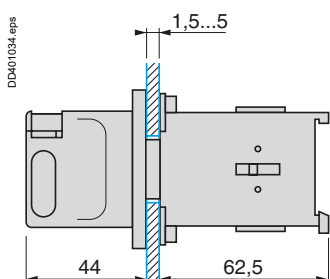
##### Switch-disconnector mounted on enclosure door

VCDN12, VCDN20, VBDN12, VBDN20

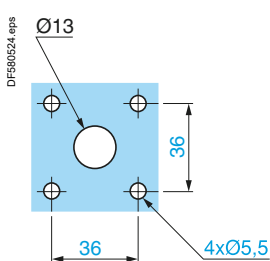
Single hole fixing



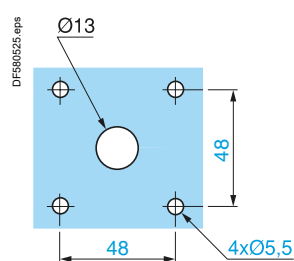
VN12, VN20  
4 screw fixing



45 x 45 front plate



60 x 60 front plate





# TeSys

## TeSys Mini-Vario Switch-disconnectors

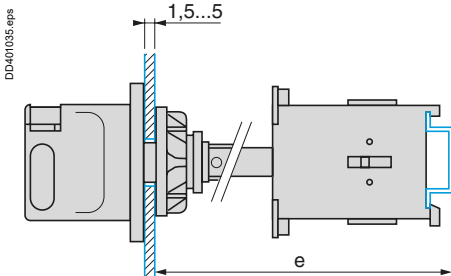
### Mounting, schemes

#### Mounting (continued)

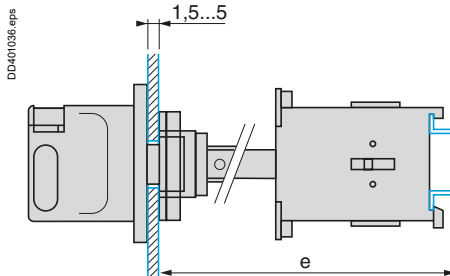
Switch-disconnector mounted at back of enclosure with shaft extension VZN17 or VZN30 (clip-on mounting on L rail)

VN12, VN20

Single hole fixing

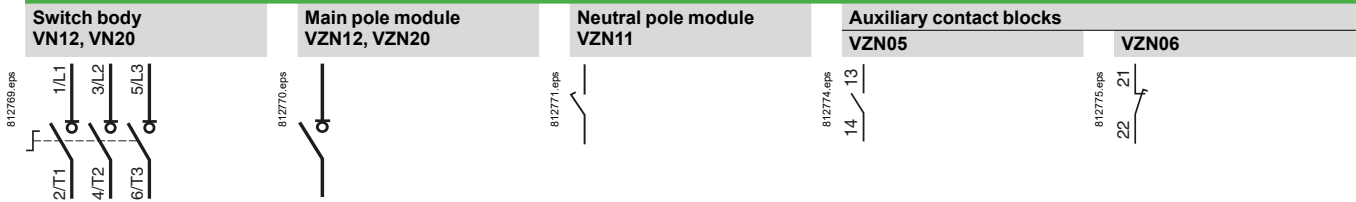


4 screw fixing



	Shaft extension	Distance (e) enclosure back/door mm
VN12, VN20	VZN17	300...330
	VZN30	400...430

#### Schemes





# TeSys

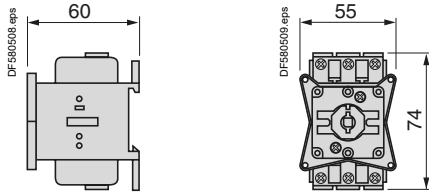
## TeSys Vario Switch-disconnectors

### Dimensions, mounting

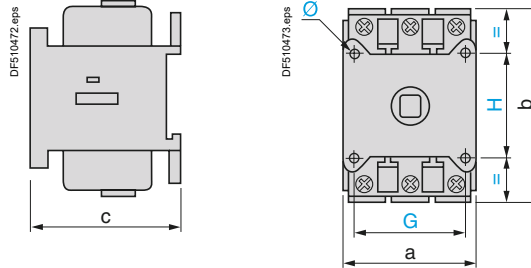
#### Dimensions

##### Switch-disconnectors

###### Switch bodies V0●, V0 to V2

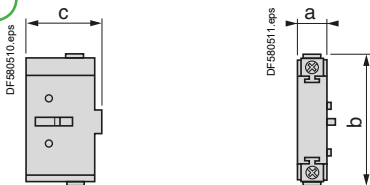


###### Switch bodies V3 to V6

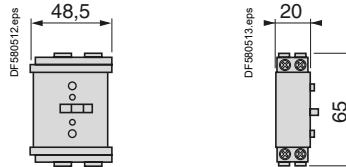


	a	b	c	G	H	Ø
V3, V4	60	83	65	48	48	5.5
V5, V6	90	125	90	68	68	5.5

###### Add-on modules VZ02 to VZ4 and VZ11 to VZ16



###### Add-on modules VZ7, VZ20



Switch-disconnectors

Ref.

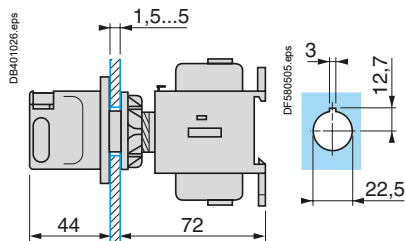


	a	b	c
VZ02 and VZ01, VZ0 to VZ2, VZ11, VZ14	16	74	35
VZ3, VZ4, VZ12, VZ15	20	83	46
VZ13, VZ16	30	125	63

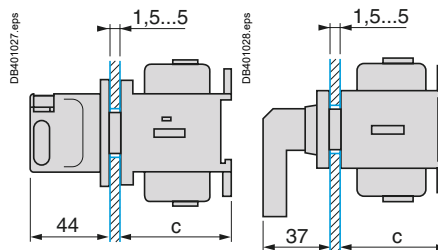
#### Mounting

##### Switch-disconnector mounted on enclosure door

###### Single hole fixing V0●, V0 to V2

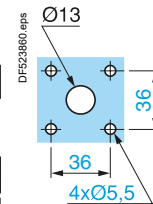


###### 4 screw fixing V0●, V0 to V4

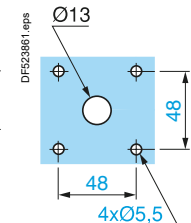


	c
V0●, V0 to V2	60
V3, V4	65

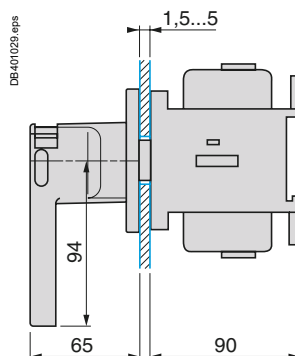
###### 4 screw fixing 45 x 45 front plate V0●, V0 to V2



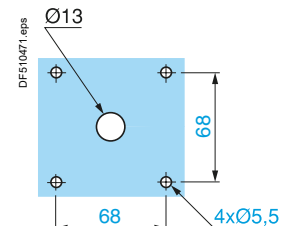
###### 4 screw fixing 60 x 60 front plate V0●, V0 to V4



###### V5 and V6. 4 screw fixing



###### 90 x 90 front plate





# TeSys

## TeSys Vario Switch-disconnectors

### Mounting, schemes

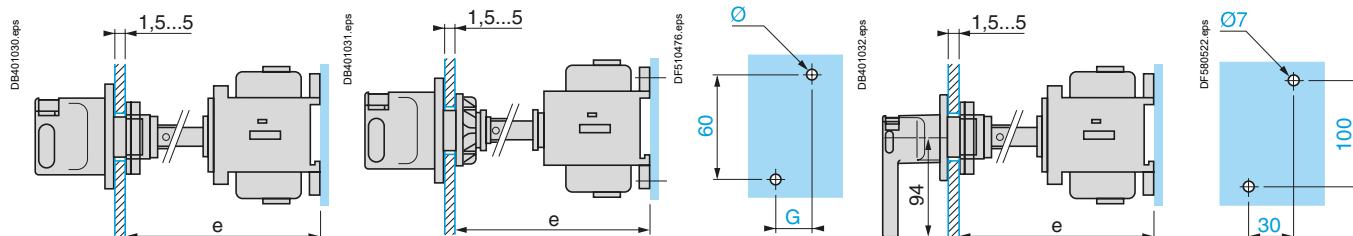
#### Mounting (continued)

##### Switch-disconnector mounted at back of enclosure

4 screw fixing  
V0●, V0 to V2 with shaft  
extension VZ17 or VZ30  
(clip-on mounting on L rail  
possible for V0● to V2)

Single hole fixing  
V3 to V4 with shaft extension  
VZ18 or VZ31

V5 and V6 with shaft extension  
VZ18 or VZ31



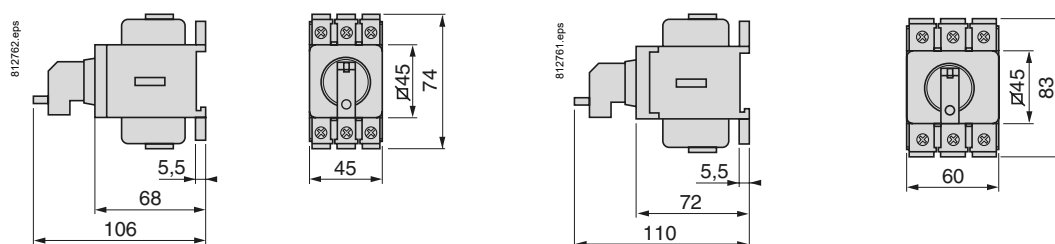
	Shaft extension	Distance (e) enc.back/door mm	Ø	G
V02 and V01 V0 to V2	VZ17	300...330	2 x 4.2	15
	VZ30	400...430	2 x 4.2	15
V3 and V4	VZ18	300...320	2 x 5	20
	VZ31	400...420	2 x 5	20

	Shaft extension	Distance (e) enc. back/door mm
V5 and V6	VZ18	300...350
	VZ31	430...450

##### Switch-disconnectors for modular distribution boards

###### VV●0 to VV●2

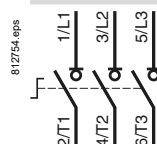
###### VV●3 to VV●4



#### Schemes

##### Switch body

V02 and V01  
V0 to V6



##### Main pole module

VZ02 and VZ01  
VZ0 to VZ4



##### Neutral pole module

VZ11 to VZ13



##### Auxiliary contact blocks

VZ7



VZ20





Switch-  
disconnectors



### TeSys DF, LS, GK Fuse carriers

Type of product	Range	Pages
Introduction		B4/2
For protection of control circuits or transformer TeSys DF and accessories	Up to 25, 32, 50 or 125 A	B4/3
For protection of control circuits or transformer TeSys DF – For North American market	Up to 30 A	B4/5
For protection of motors or transformers TeSys LS, GK and accessories	Up to 25, 32, 50 A	B4/6
Technical Data for Designers		B4/9



## Operation: safety

The fuse carrier performs two basic functions:

- it isolates the downstream circuit by means of a visible break and wide opening contacts,
- it holds the cartridge fuses designed to protect the installation against short-circuits.

The type of cartridge fuse needed to protect the circuit must be determined before selecting the fuse carrier.

## Cartridge fuse selection (type, rating, size)

## Type

<b>Application</b>	<ul style="list-style-type: none"> <li>■ Motor protection.</li> <li>■ Transformer protection.</li> </ul>
<b>Solution</b>	<ul style="list-style-type: none"> <li>■ <b>aM type</b> fuses. These fuses are designed to withstand high current peaks of a very short duration. They must be combined with a thermal overload relay coupled with a contactor.</li> </ul>
<b>Application</b>	<ul style="list-style-type: none"> <li>■ Lighting circuit protection.</li> <li>■ Supply line protection.</li> <li>■ Furnace protection.</li> </ul>
<b>Solution</b>	<ul style="list-style-type: none"> <li>■ <b>gG</b> type fuses, which are more widely used but whose limiting capacity is weaker than that of <b>aM</b> type fuses.</li> </ul>

## Rating

gG fuses aM fuses	See standard NF C 15-100. Table 53 A paragraph 532-2-1 and table 52 C paragraph 523-1.						
	Motors 3 x 220 V		Motors 3 x 400 V		Cartridge fuses type aM		Fuse carrier
	P	in	P	in	Size	Rating	
	kW	A	kW	A		A	
	9	32	15	28.5	10 x 38	32	LS1D32
	11	39	22	44	14 x 51	50	GK1EK
22	75	37	73	22 x 58	80	GK1FK	

## Size

Use the “fuse characteristics” table opposite to select the correct fuse size according to:

- the nominal current of the circuit to be protected,
- the operational voltage.

## Fuse carrier selection

<b>Application</b>	<b>Isolation</b> of a circuit for safety reasons only.
<b>Solution</b>	The fuse carrier may be fitted with links. The maximum permissible current is indicated in the "pole characteristics" table opposite.
<b>Application</b>	<b>Isolation</b> of a circuit and its <b>protection</b> against short-circuits.
<b>Solution</b>	<p>Select a fuse carrier according to:</p> <ul style="list-style-type: none"> <li>■ the type of cartridge fuse required,</li> <li>■ the maximum permissible current in the fuse carrier poles (see "pole characteristics" table opposite). If the operational current is greater than the maximum permissible current in the poles of the fuse carrier corresponding to the cartridge fuse size selected, select the fuse carrier the next size up.</li> </ul> <p>The <b>safety</b> provided by using a fuse carrier can be increased by adding a padlocking device with up to three padlocks.</p>

## Recommendations for use

The fuse carrier conforms to utilisation category AC-21A/22A of standard IEC 60947-3. It is therefore recommended that the fuse carrier early break auxiliary contacts always be inserted in the coil circuit of the contactor with which it is in series. If the fuse carrier is not associated with a contactor, it is essential to ensure that it will be operated off-load.





DF101



DF141



DF221



DF101NV



DF141NV



DF221NV



DF103



DF143NC



DF223NC



DF103V



DF143VC



DF223VC

## For protection of control circuits or transformers

### Fuse carriers <sup>(1)</sup>

Conventional thermal current (Ith)	Size of cartridge fuse or link	Composition	Sold in lots of	Unit reference
A	mm			
25	8.5 x 32	1 P	12	DF81
		N	12	DF10N
		1 P + N <sup>(2)</sup>	6	DF81N
		2 P	6	DF82
		3 P	4	DF83
		3 P + N <sup>(2)</sup>	3	DF83N
32	10 x 38	1 P	12	DF101
		N	12	DF10N
		1 P + N <sup>(2)</sup>	6	DF101N
		2 P	6	DF102
		3 P	4	DF103
		3 P + N <sup>(2)</sup>	3	DF103N
50	14 x 51	1 P	6	DF141
		N	6	DF14N
		1 P + N <sup>(2)</sup>	3	DF141N
		2 P	3	DF142
		3 P	2	DF143C <sup>(3)</sup>
		3 P + N <sup>(2)</sup>	1	DF143NC <sup>(3)</sup>
125	22 x 58	1 P	6	DF221
		N	6	DF22N
		1 P + N <sup>(2)</sup>	3	DF221N
		2 P	3	DF222
		3 P	2	DF223C <sup>(3)</sup>
		3 P + N <sup>(2)</sup>	1	DF223NC <sup>(3)</sup>

### Fuse carriers with "blown fuse" indicators (LED) <sup>(1) (4)</sup>

Conventional thermal current (Ith)	Size of cartridge fuse or link	Composition	Sold in lots of	Unit reference
A	mm			
25	8.5 x 32	1 P	12	DF81V
		1 P + N <sup>(2)</sup>	6	DF81NV
		2 P	6	DF82V
		3 P	4	DF83V
		3 P + N <sup>(2)</sup>	3	DF83NV
32	10 x 38	1 P	12	DF101V
		1 P + N <sup>(2)</sup>	6	DF101NV
		2 P	6	DF102V
		3 P	4	DF103V
		3 P + N <sup>(2)</sup>	3	DF103NV
50	14 x 51	1 P	6	DF141V
		1 P + N <sup>(2)</sup>	3	DF141NV
		2 P	3	DF142V
		3 P	2	DF143VC <sup>(3)</sup>
		3 P + N <sup>(2)</sup>	1	DF143NVC <sup>(3)</sup>
125	22 x 58	1 P	6	DF221V
		1 P + N <sup>(2)</sup>	3	DF221NV
		2 P	3	DF222V
		3 P	2	DF223VC <sup>(3)</sup>
		3 P + N <sup>(2)</sup>	1	DF223NVC <sup>(3)</sup>

(1) Each pole can be marked. A clip-in marker holder is provided for this purpose. Clip-in markers type AB1R● or AB1G● can also be used. DF8●●● and DF10●●● are pad lockable fuse carriers.

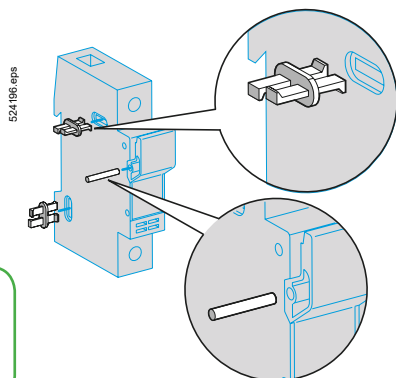
(2) N: neutral pole fitted with a locked tubular link as standard.

(3) A letter "C" in the reference indicates that the fuse carrier can be fitted with auxiliary early break, "blown fuse" signalling and "fuse present" signalling contacts.

(4) Operational voltage of the blown fuse indicator: 110 V...690 V.







Detail of assembly clip and pin mounting

Fuse  
carriers



### Accessories

#### Auxiliary early break and "blown fuse" signalling contacts <sup>(1)</sup>

Fuse carriers to be equipped	Size of cartridge fuse or link	Number of contacts	Sold in lots of	Unit reference
DF14 (3 P or 3 P + N)	14 x 51	1	1	DF14AM1
		2	1	DF14AM2
DF22 (3 P or 3 P + N)	22 X 58	1	1	DF22AM1
		2	1	DF22AM2

#### Fuse carrier assembly kits <sup>(2)</sup>

Fuse carriers to be assembled	Size of cartridge fuse or link	Composition	Sold in lots of	Unit reference
DF8	8.5 x 32	1 pin, 2 clips	12	DF10AP
DF10	10 x 38			
DF14	14 x 51	1 pin, 3 clips	10	DF14AP
DF22	22 x 58	1 pin, 3 clips	10	DF22AP

### Marking accessories

Description	Composition	Marking	Sold in lots of	Unit reference
Clip-in markers	Strip of 10 identical numbers or letters	0...9	25	AB1R● <sup>(3)</sup>
		A...Z	25	AB1G● <sup>(3)</sup>

### Substitution

#### Fuse carriers

Old range			New range	
Reference	Size of cartridge fuse or link	Composition	Reference w/o indicator	Reference with indicator
DF6AB08	8.5 x 32	1 P	DF81	DF81V
DF6AB10	10 x 38	1 P	DF101	DF101V
DF6N10	8.5 x 32 or 10 x 38	1 N	DF10N	–
GK1CC	8.5 x 32	1 P + N	DF81N	DF81NV
GK1CD	8.5 x 32	2 P	DF82	DF82V
GK1CF	8.5 x 32	3 P	DF83	DF83V
GK1CH	8.5 x 32	3 P + N	DF83N	DF83NV
GK1DC	10 x 38	1 P + N	DF101N	DF101NV
GK1DD	10 x 38	2 P	DF102	DF102V
GK1DF	10 x 38	3 P	DF103	DF103V
GK1DH	10 x 38	3 P + N	DF103N	DF103NV
GK1EB	14 x 51	1 P	DF141	DF141V
GK1EN	14 x 51	1 N	DF14N	–
GK1EC	14 x 51	1 P + N	DF141N	DF141NV
GK1ED	14 x 51	2 P	DF142	DF142V
GK1EF	14 x 51	3 P	DF143C	DF143VC
GK1EH	14 x 51	3 P + N	DF143NC	DF143NVC
GK1FB	22 x 58	1 P	DF221	DF221V
GK1FN	22 x 58	1 N	DF22N	–
GK1FC	22 x 58	1 P + N	DF221N	DF221NV
GK1FD	22 x 58	2 P	DF222	DF222V
GK1FF	22 x 58	3 P	DF223C	DF223VC
GK1FH	22 x 58	3 P + N	DF223NC	DF223NVC

#### Fuse carrier assembly kits

Old range		New range
Reference	Size of cartridge fuse or link	Reference
GK1AP2	8.5 x 32 or 10 x 38	DF10AP
GK1AP3	8.5 x 32 or 10 x 38	DF10AP
	14 x 51	DF14AP
GK1AP4	8.5 x 32 or 10 x 38	DF10AP
	22 x 58	DF22AP
GK1AP5	14 x 51	DF14AP
GK1AP6	14 x 51	DF14AP
	22 x 58	DF22AP
GK1AP9	22 x 58	DF22AP

<sup>(1)</sup> These auxiliary contacts provide the following functions: early break, "blown fuse" signalling (if the fuse carrier is fitted with striker fuses) and "fuse present" signalling.

<sup>(2)</sup> 1 pin and 2 clips are required to assemble two DF8 or DF10 fuse carriers together.  
1 pin and 3 clips are required to assemble two DF14 or DF22 fuse carriers together.

<sup>(3)</sup> When ordering, replace the ● in the reference with the number or letter required. Example: AB1-R1 or AB1-GA.



## For protection of control circuits or transformers

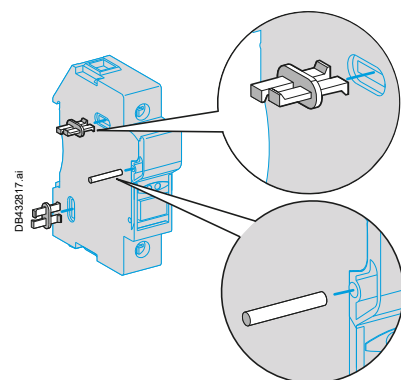
## References



DFCC1



DFCC3V



Detail of assembly clip and pin mounting

Fuse carriers <sup>(1)</sup>

Conventional thermal current (Ith)	Size of cartridge fuse or link	Composition	Sold in lots of	Unit reference
<b>A</b>				
<b>30</b>	Class CC	1 P	12	<b>DFCC1</b>
		2 P	12	<b>DFCC2</b>
		3 P	6	<b>DFCC3</b>

Fuse carriers with “blown fuse” indicators (LED) <sup>(1) (2)</sup>

Conventional thermal current (Ith)	Size of cartridge fuse or link	Composition	Sold in lots of	Unit reference
<b>A</b>				
<b>30</b>	Class CC	1 P	12	<b>DFCC1V</b>
		2 P	6	<b>DFCC2V</b>
		3 P	6	<b>DFCC3V</b>

Fuse carrier assembly kits <sup>(3)</sup>

Fuse carriers to be assembled	Size of cartridge fuse or link	Composition	Sold in lots of	Unit reference
<b>DFCC</b>	Class CC	1 pin, 2 clips	12	<b>DF10AP</b>

## Marking accessories

Description	Composition	Marking	Sold in lots of	Unit reference
<b>Clip-in markers</b>	Strip of 10 identical numbers or letter	0...9	25	<b>AB1R●</b> <sup>(4)</sup>
		A...Z	25	<b>AB1G●</b> <sup>(4)</sup>

<sup>(1)</sup> Each pole can be marked. A clip-in marker holder is provided for this purpose.

Clip-in markers type AB1R● or AB1G● can also be used.

DFCC fuse holders are pad lockable.

<sup>(2)</sup> Operational voltage of the blown fuse indicator: 230 V...690 V.

<sup>(3)</sup> 1 pin and 2 clips are required to assemble two DFCC fuse carriers together.

<sup>(4)</sup> When ordering, replace the p in the reference with the number or letter required.

Example: **AB1R1** or **AB1GA**.





LS1D323



LS1D32



GK1EK



LS1D32

+ LA8D324

## For protection of motors or transformers

### 3-pole basic blocks

#### Connection by spring terminals

Rating	Cartridge fuse size	Number of early break contacts <sup>(1)</sup>	Single-phase protection device <sup>(2)</sup>	Reference <sup>(3)</sup>	Weight kg
25 A	10 x 38	— <sup>(4)</sup>	Without	LS1D323	0.270

#### Connection by screw clamp terminals or connectors

32 A	10 x 38	— <sup>(4)</sup>	Without	LS1D32	0.300
50 A	14 x 51	1	Without	GK1EK	0.430
			With	GK1EV	0.470
		2	Without	GK1ES	0.470
			With	GK1EW	0.510

### 4-pole basic blocks

#### Connection by screw clamp terminals or connectors

32 A	10 x 38	— <sup>(4)</sup>	Without	LS1D32 + LA8D324 <sup>(5)</sup>	0.300
50 A	14 x 51	1	Without	GK1EM	0.570
			With	GK1EY	0.600
		2	Without	GK1ET	0.610
			With	GK1EX	0.650

### Fuse carriers for the North American market

25 and 30 A basic blocks: please consult your Regional Sales Office.

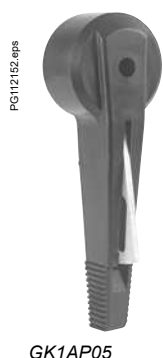
- (1) With 1 or 2 early break contacts to be inserted in the contactor control circuit.
- (2) Fuse carriers with single-phase protection device must be fitted with striker fuses.
- (3) LS1D: clips directly onto a 35 mm rail or screw fixing.  
GK1: clips directly onto a 35 mm rail or Telequick mounting plate.
- (4) Addition of add-on contact block, see page B4/7.
- (5) Can be mounted on left-hand or right-hand side of the basic block.



# TeSys

## TeSys LS, GK Fuse carriers - Handles and accessories

### Product references



#### Add-on contact blocks

Description	For use on	Mounting	Maximum number	Type of contacts	Sold in lots of	Unit reference
Instantaneous auxiliary contacts (early break contacts)	LS1D32	Front	1	N/O + N/C	10	GVAE11
				N/O + N/O	10	GVAE20
	LS1D323	Front	1	N/O + N/C	10	GVAE113
				N/O + N/O	10	GVAE203

#### Operators

For fuse carrier		For mounting on	Reference
Rating	Number of poles		
<b>Side handles</b>			
125 A	3 or 4	Right-hand side	GK1AP07
		Left-hand side	GK1AP08

#### Front handles <sup>(1)</sup>

32 - 50 - 125 A	Fitted as standard
-----------------	--------------------

#### External handles

32 A	3 or 4	Right-hand side (IP54)	LS1D32005 <sup>(2)</sup>
		Left-hand side (IP54)	LS1D32006
50 A	3 or 4	Right-hand side	GK1AP05
		Left-hand side	GK1AP06

#### Padlocking devices <sup>(3)</sup>

For fuse carrier			Reference
Rating	Number of poles	Single-phase protection device	
32 A	3 or 4	Without	integral
50 A	3	Without	GK1AV07
		With	GK1AV08
	4	Without	GK1AV08
		With	GK1AV09

#### Links

##### Tubular links

For fuse carrier		Sold in lots of	Unit reference
Rating	Number of poles		
32 A	3 or 4	10	DK1CB92 <sup>(4)</sup>
50 A	3 or 4	10	DK1EB92 <sup>(5)</sup>
125 A	3 or 4	10	DK1FA92 <sup>(5)</sup>

<sup>(1)</sup> Fitted as standard on 32, 50 and 125 A fuse carriers type GK1.

<sup>(2)</sup> Reference LS1D32005 replaces reference DK1FB005.

<sup>(3)</sup> For the 125 A rating, use side handles GK1AP07 or GK1AP08.

<sup>(4)</sup> For use on a neutral circuit, the tubular link can be interlocked with special device LA8D25906 (sold in lots of 10).

<sup>(5)</sup> 50 A fuse carriers type GK1 are fitted with an interlocked neutral tubular link as standard.







### Accessories for LS1D32 (screw clamp terminals)

Description	Application	Sold in lots of	Unit reference
Plate for mounting	LS1D32 and contactor LC1D09...D38 with front faces aligned	1	LAD311
Combination blocks	Between LS1D32 and contactor LC1K or LP1K	10	GV2AF01
	Between LS1D32 and contactor LC1D09...D38	10	GV2AF3
	Between LS1D32 mounted on LAD311 and contactor LC1D09...D38	10	GV2AF4

Description	Application	Pitch mm	Reference
Sets of 3-pole 63 A busbars	2 tap-offs	45	GV2G245
		54	GV2G254
		72	GV2G272
	3 tap-offs	45	GV2G345
		54	GV2G354
	4 tap-offs	45	GV2G445
		54	GV2G454
		72	GV2G472
	5 tap-offs	54	GV2G554

Description	Application	Sold in lots of	Unit reference
Protective end cover	For unused busbar outlets	5	GV1G10
Terminal block Connection from the top	For supply to one or more GV2G busbar sets	1	GV1G09
Cover for terminal block	For mounting in modular panels	10	LA9E07
Padlocking device	For use with up to 4 padlocks (not supplied) Ø6 mm shank max	1	GV2V03

### Accessories for LS1D323 (spring terminals)

Description	Application	Reference
Plate for mounting	LS1D323 and contactor LC1D09...D38 with front faces aligned	LAD311

Description	Extension by	Number of starters	Reference
Power splitter box, 63 A	LAD32●	2	LAD322
		4	LAD324

Description	Kit contents	Reference
Assembly and power connection kit for LS1D323 and LC1D093...D323	1 LAD311 plate for mounting LS1D323 2 LAD341 power connection modules - between LS1D323 and power splitter box - between LS1D323 and contactor	LAD352

Description	Maximum capacity	Application	Sold in lots of	Unit reference
Upstream terminal block	16 mm <sup>2</sup>	Power supply to 1 or 2 power splitter boxes	1	LAD3B1
Downstream terminal block	16 mm <sup>2</sup>	Connection of motor cables	1	LAD331
Cable end reducer	—	For connection of conductors from 1 to 1.5 mm <sup>2</sup>	20	LAD99



## Technical Data for Designers

### Contents

#### TeSys DF:

- > Characteristics ..... B4/10
- > Dimensions and schemes ..... B4/11

#### TeSys DF for the North American market:

- > Characteristics ..... B4/12
- > Dimensions and schemes ..... B4/13

#### TeSys LS and GK:

- > Characteristics ..... B4/14
- > Dimensions ..... B4/15
- > Schemes ..... B4/16



## Environment characteristics

Fuse carrier type			DF8	DF10	DF14	DF22
Conforming to standards			IEC/EN 60947-3, IEC/HD 60269-2	IEC/EN 60947-3 <sup>(1)</sup> , IEC/HD 60269-2, R22HL2, UL 4248-1 <sup>(2)</sup> , CSA C22.2 No 4248-1 <sup>(2)</sup>	IEC/EN 60947-3, UL 4248-1, CSA C22.2 No 4248-1	
Product certification			IEC, EAC, DNV-GL, CCC	IEC, UL, CSA, EAC, DNV-GL, CCC	IEC, UL, CSA, EAC	
Degree of protection	Conforming to IEC 60529		IP 20			
Ambient air temperature	Storage	°C	-40...+80			
	For operation, with derating <sup>(1)</sup>	°C	-20...+60			
Operating positions			± 23° in relation to normal mounting plane			
Flame resistance	Conforming to IEC 60695-2-1	°C	960			

## Pole characteristics

Fuse size	mm	8.5 x 32		10 x 38		14 x 51		22 x 58		
Rated insulation voltage (Ui) with tubular links, a.c. or D.C. supply	V	500		690		690		690		
Rated impulse withstand voltage (Uimp)	kV	6		6		8		8		
Conventional thermal current (Ith) for ambient air temperature ≤ 20 °C <sup>(3)</sup>										
With tubular links	A	25		32		50		125		
With aM cartridge fuses	A	25		32		50		125		
With gG cartridge fuses	A	25		32		50		100		
Rated conditional short-circuit current Conforming to IEC 60947-3										
400 V	kA	20		120		120		120		
500 V	kA	–		120		120		120		
690 V	kA	–		–		80		80		
Peak withstand current (dynamic stress) Conforming to IEC 60269-1										
With tubular links	kA	11		15		15		19		
Cabling (number of conductors x c.s.a.)			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Solid cable	mm²	1 x 1.5	1 x 16 2 x 6	1 x 1.5	1 x 16 2 x 6	1 x 2.5	1 x 25 2 x 10	1 x 2.5	1 x 35 2 x 25	
Flexible cable without cable end	mm²	1 x 1.5	1 x 10 2 x 6	1 x 1.5	1 x 10 2 x 6	1 x 2.5	1 x 25 2 x 10	1 x 2.5	1 x 35 2 x 16	
Flexible cable with cable end	mm²	1 x 1.5	1 x 10 2 x 6	1 x 1.5	1 x 10 2 x 6	1 x 2.5	1 x 25 2 x 10	1 x 2.5	1 x 35 2 x 16	
Tightening torque	Nm	2.2		3.5		4				

## Characteristics of early break and signalling contacts DF14 AM and DF22 AM

Rated insulation voltage (Ui) a.c. supply		V	250			
Conventional thermal current (Ith) for ambient air temperature ≤ 20 °C <sup>(1)</sup>		A	5			
Rated operational current			24 V	48 V	127 V	240 V
	Category AC-15	A	4	4	3	2.5
	Category DC-13	A	3	1	0.2	0.1
Definition of rated characteristics	Conforming to IEC 60947-5-1		B300			
Low load operating characteristics	Minimum voltage	V	10			
	Minimum current	mA	30			
Cabling			Faston connectors			

<sup>(1)</sup> DF101PV excluded.

<sup>(2)</sup> DF101PV add UL/CSA 4248-19.

<sup>(3)</sup> For use in an installation with ambient temperature > 20 °C, apply a derating coefficient:

Maximum temperature	20 °C	30 °C	40 °C	50 °C	60 °C
Max. relative humidity	95 %	90 %	80 %	50 %	50 %
Current derating coefficient	1	0.95	0.9	0.8	0.7

Number of poles (each side)	1 to 3	4 to 6	≥ 7
Current derating coefficient	1	0.95	0.9



# TeSys

## TeSys DF Fuse carriers

### Dimensions, schemes

#### Dimensions

##### Modular fuse carriers 25 A and 32 A

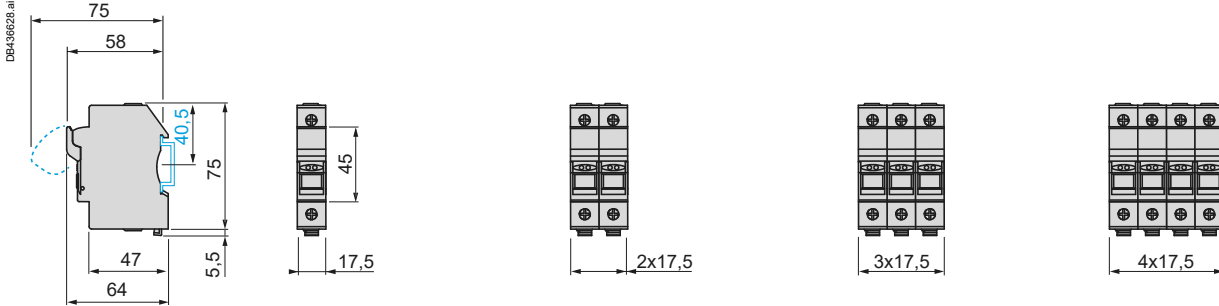
Mounting on 35 mm rail

DF81 and DF81V  
DF101 and DF101V  
DF10N

DF81N and DF81NV  
DF82 and DF82V  
DF101N and DF101NV  
DF102 and DF102V

DF83 and DF83V  
DF103 and DF103V

DF83N and DF83NV  
DF103N and DF103NV



##### Modular fuse carriers 50 A

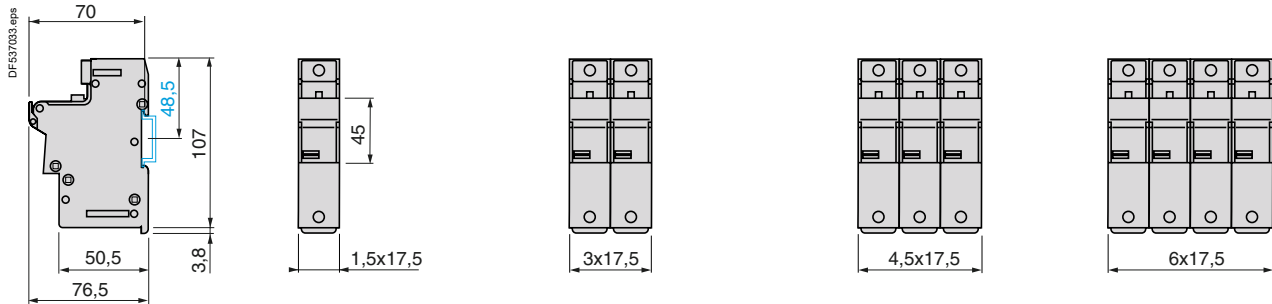
Mounting on 35 mm rail

DF141 and DF141V  
DF14N

DF141N and DF141NV  
DF142 and DF142V

DF143C and DF143VC

DF143NC and DF143NVC



##### Modular fuse carriers 125 A

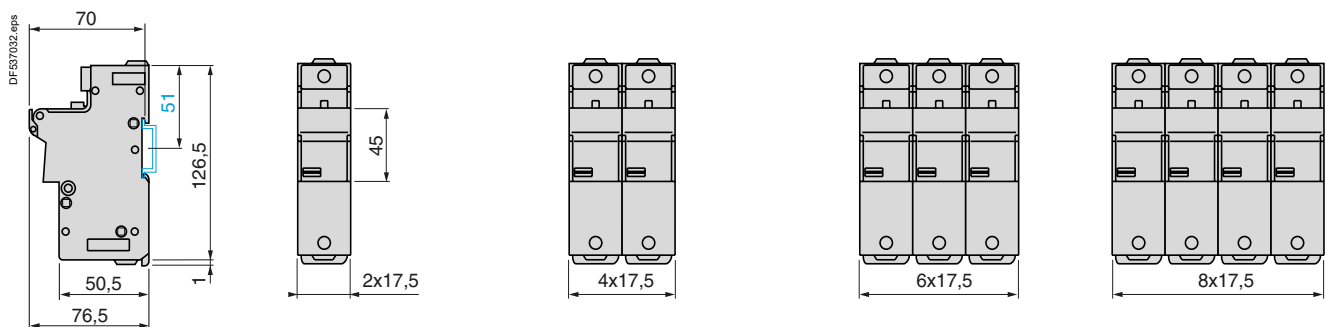
Mounting on 35 mm rail

DF221 and DF221V  
DF22N

DF221N and DF221NV  
DF222 and DF222V

DF223C and DF223VC

DF223NC and DF223NVC



#### Schemes

##### Modular fuse carriers

DF•1P

DF•N

DF•1P + N

DF•2P



DF•3P

DF•3P + N





Environment characteristics					
Fuse carrier type		DFCC			
Conforming to standards			UL 4248-1 & 4, CSA 22-2 No 4248-1 & 4		
Product certification			UL, CSA, CCC		
Degree of protection	Conforming to IEC 60529		IP 20		
Ambient air temperature	Storage	°C	-40...+80		
	For operation, with derating <sup>(1)</sup>	°C	-20...+60		
Operating positions	Without derating		±23° in relation to normal vertical mounting plane		
Flame resistance	Conforming to IEC 60695-2-1	°C	960		
Pole characteristics					
Fuse carrier type		DFCC			
Fuse size			Class CC		
Rated insulation voltage (Ui) with tubular links, a.c. supply		V	600		
Rated impulse withstand voltage (Uimp)		kV	6		
Conventional thermal current (Ith) for ambient air temperature ≤ 40 °C <sup>(1)</sup>					
	With tubular links	A	30		
	With aM cartridge fuses	A	30		
	With gG cartridge fuses	A	30		
Short-circuit current withstand With UL 248-4 Class CC fuses					
	Conforming to UL 512 at 600 V	kA	200		
Cabling (number of conductors x c.s.a.)		Min.	Max.		
	Solid cable	mm²	1 x 1.5 1 x 16 2 x 6		
	Flexible cable without cable end	mm²	1 x 1.5 1 x 10 2 x 6		
	Flexible cable with cable end	mm²	1 x 1.5 1 x 10 2 x 6		
Tightening torque		Nm	2.2		
<sup>(1)</sup> For use in an installation with ambient temperature > 20 °C, apply a derating coefficient:					
Maximum temperature	20 °C	30 °C	40 °C	50 °C	60 °C
Max. relative humidity	95 %	90 %	80 %	50 %	50 %
Current derating coefficient	1	0.95	0.9	0.8	0.7




# TeSys

## TeSys DF Fuse carriers for North American market

### Dimensions, schemes

#### Dimensions

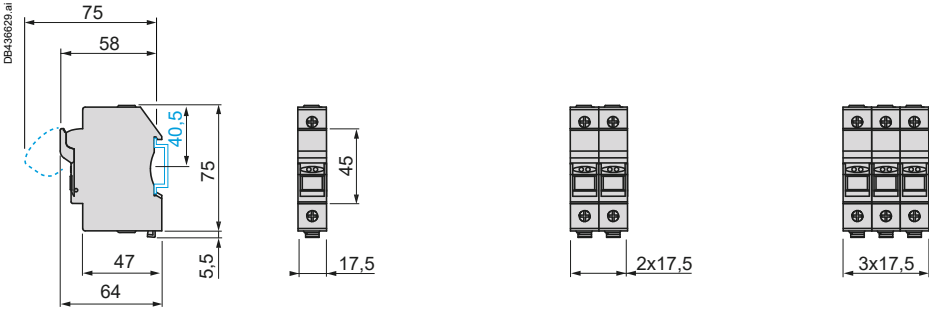
##### Modular fuse carriers 30 A

Mounting on 35 mm  rail

DFCC1 and DFCC1V

DFCC2 and DFCC2V

DFCC3 and DFCC3V



#### Schemes

##### Modular fuse carriers

DFCC1P

DFCC2P

DFCC3P



Fuse  
carriers

i

Ref.

...



# TeSys

## TeSys LS, GK Fuse carriers

### Characteristics

Fuse carriers



Ref.



Environment				
Fuse carrier type		LS1D32	LS1D323	GK1E●
Conforming to standards	NF EN 60947-3	●		●
	IEC 60947-3	●		●
Product certifications		BV, UR		–
Ambient air temperature for operation with links without derating		°C	-50...+70	-50...+70
Maximum tilt in relation to normal vertical mounting plane			±23°	±23°

Pole characteristics				
Fuse size		10 x 38	10 x 38	14 x 51
Rated operational voltage with links, a.c. supply	V	690	690	690
Maximum continuous current at ambient temperature ≤ 40 °C <sup>(1)</sup> (Min. cable Ø/le) With tubular links	mm²/A	6/32 or 4/25 or 2.5/16	4/25 or 2.5/16	10/50 or 6/40
	mm²/A	6/32 or 4/22 or 2.5/20	4/25 or 2.5/20	10/50 or 6/35
	mm²/A	4/25 or 2.5/20 or 1.5/16	2.5/20 or 1.5/16	10/40 or 6/32

Early break contact characteristics				
Rated operational voltage	V	~ 250. --- 60	~ 250. --- 60	~ 500 --- 48
Conventional thermal current	A	2.5	2.5	6 3

Blow fuse contact characteristics 95/96-98				
Rated operational voltage	V	–	–	~ 250 --- 24
Conventional thermal current	A	–	–	6 3

Cartridge fuse characteristics				
Fuse size		10 x 38	10 x 38	14 x 51
Type aM ~ 400 V ~ 500 V ~ 660 V	A	32 <sup>(2)</sup>	25	50
	A	20	20	40
	A	–	–	25
Type gG ~ 400 V ~ 500 V ~ 660 V	A	25 <sup>(2)</sup>	25	40
	A	25	25	40
	A	–	–	25
Maximum power dissipated by fuse	W	3	3	8.5

Cabling								
Connection by screw clamp terminals or connectors								
Number and c.s.a. of conductors			Min.	Max.	Min.	Max.	Min.	Max.
	Solid cable	mm²	2 x 1	2 x 6	—	—	1 x 2.5	1 x 25
	Flexible cable without cable end	mm²	2 x 1.5	2 x 6	—	—	1 x 2.5	1 x 25
	Flexible cable with cable end	mm²	2 x 1	2 x 4	—	—	1 x 2.5	1 x 16
Connection			Screw clamp terminals		—	—	Connector	
Tightening torque		Nm	1.7		—	—	2	

Connection by spring terminals								
Number and c.s.a. of conductors		mm²	Min.	Max.	Min.	Max.	Min.	Max.
Solid cable		mm²	–	–	2 x 1 <sup>(3)</sup>	2 x 4	–	–
Flexible cable without cable end		mm²	–	–	2 x 1.5 <sup>(1)</sup>	2 x 4	–	–

(1) For use in an installation with ambient temperature > 55 °C, apply a derating coefficient equivalent to  $\sqrt{\frac{120 - \text{ambient temperature}}{80}}$

(2) These values are for fuse carriers mounted side by side with a gap of 10 mm between them or mounted with sets of busbars GV2●54. If mounted side by side without a gap, use the following fuse sizes: aM fuse: 25 A and gG fuse: 20 A.

(3) For cross-sections 1 to 1.5 mm², the use of an LA9D99 cable end reducer is recommended.

Introduction:  
page B4/2

References:  
pages B4/6 to B4/8

Dimensions:  
page B4/15

Schemes:  
page B4/16



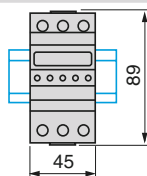
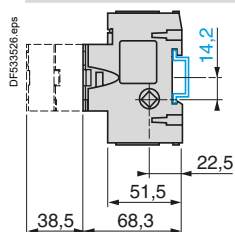
# TeSys

## TeSys LS, GK Fuse carriers

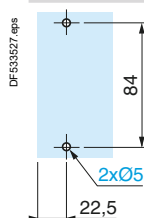
### Dimensions, mounting

#### LS1D32

##### Mounting on rail NSYDPR200BD

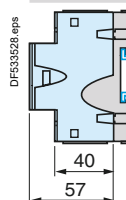


##### Panel mounting

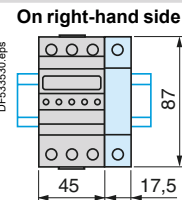
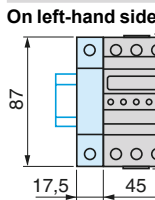


#### LS1D32 + LA8D324

##### Mounting on rail NSYDPR200BD

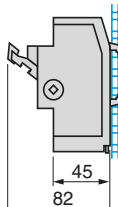
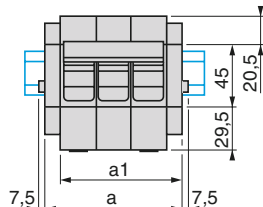
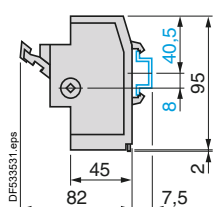


##### Mounting of 4th pole



#### GK1EK, EM, ES, ET, EV, EW, EX, EY

##### Mounting on rail NSYDPR200BD

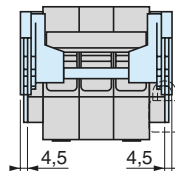
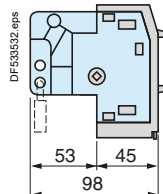


##### Mounting on pre-slotted plate AM1P

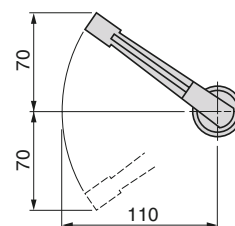
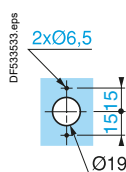
a: with single-phase protection device.  
a1: without single-phase protection device.

GK1	a		a1	
	3 P	4 P	3 P	4 P
EK	—	—	88	—
EM	—	—	—	114
ES	—	—	97	—
ET	—	—	—	123
EV	106	—	—	—
EW	115	—	—	—
EX	—	141	—	—
EY	—	132	—	—

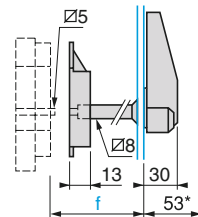
#### GK1E + GK1AV (padlocking device)



#### External operator GK1AP05 right-hand, GK1AP06 left-hand



##### Panel cut-out



#### External operator, RH or LH side

External operator, RH or LH side	f
GK1EK, EM, ES, ET	29...114
GK1EV, EW, EX, EY	29...114



# TeSys

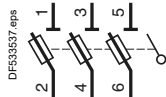
## TeSys LS, GK Fuse carriers

### Schemes

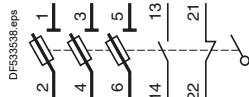
#### Fuse carriers without single-phase protection device

##### 3-pole

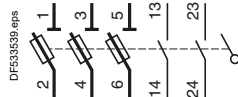
###### LS1D32, D323



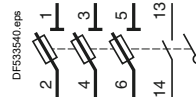
###### LS1D32, D323 + GVAE11●



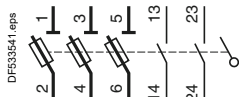
###### LS1D32, D323 + GVAE20●



###### GK1EK

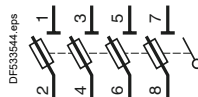


###### GK1ES



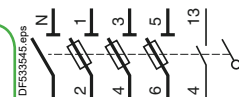
##### 4-pole

###### LS1D32 + LA8D324

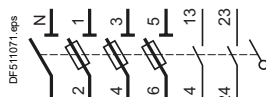


#### 3-pole + Neutral

###### GK1EM



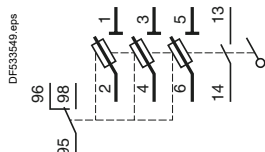
###### GK1ET



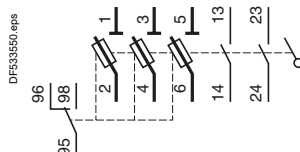
#### Fuse carriers with single-phase protection device

##### 3-pole

###### GK1EV

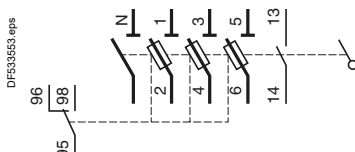


###### GK1EW

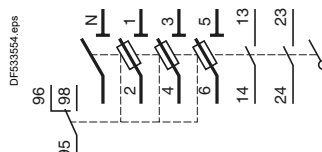


#### 3-pole + Neutral

###### GK1EY



###### GK1EX



Fuse  
carriers



Ref.



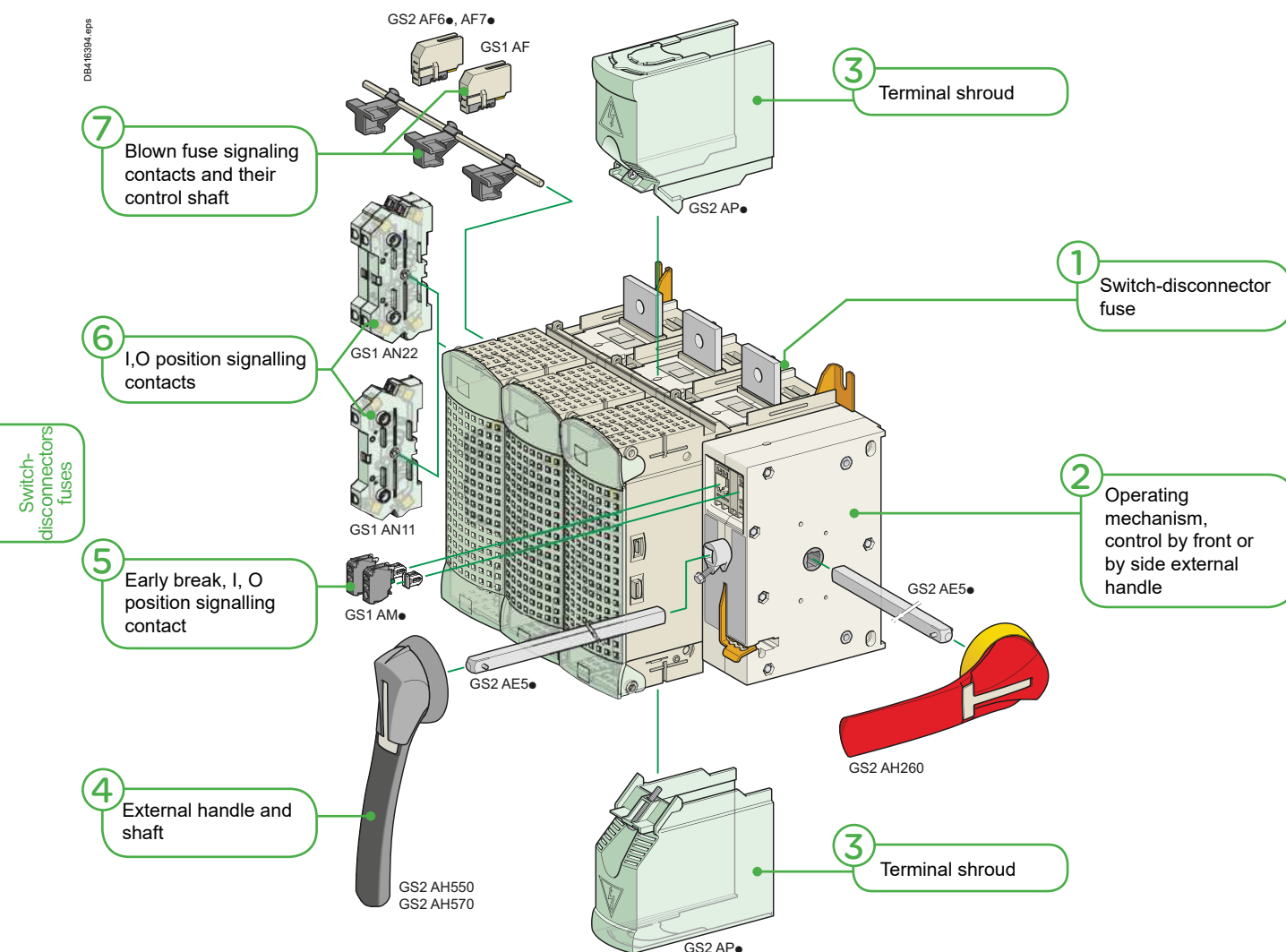


Introduction			B5/2
TeSys GS Switch-disconnector fuses			
Type of product	Range		Pages
IEC - Switch-disconnector fuses For NFC / DIN fuses	From 32 to 1250 A		B5/4
IEC - Switch-disconnector fuses For BS fuses	From 32 to 1250 A		B5/6
UL - Switch-disconnector fuses For CC / J fuses	From 30 to 800 A		B5/8
NFC - Cartridge fuses Type aM, gG	From 0.16 to 125 A		B5/10
DIN - Cartridge fuses Type aM, gG	From 10 to 1250 A		B5/11
Auxiliary contacts for IEC and UL switch-disconnector fuses	From 32 to 1250 A		B5/12
Handles	From 32 to 1250 A		B5/13
Other accessories	From 32 to 1250 A		B5/14
Technical Data for Designers			B5/15



#### A customizable functional block

Whatever its rating, the switch-disconnector fuse fits the need: particular position of the handle, triggering of an automatic control before full opening, enhanced protection of terminals...



Customizable

#### GS2630 A switch-disconnector fuse

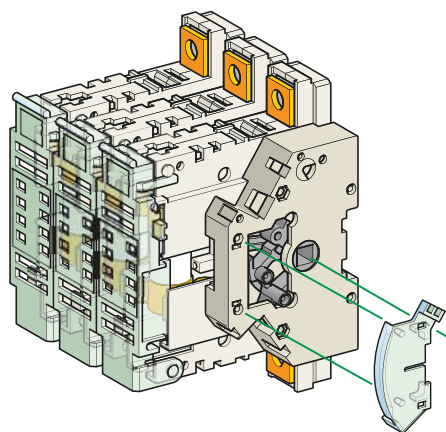
- ① **Switch-disconnector fuse**
  - NFC/DIN or BS fuse compatible
  - Enhanced isolation between poles
  - On-load making/breaking with double break isolation of the power circuit
- ② **Operating mechanism**
  - For one front or side external handle, right or left side
  - Cavity for early-break contacts
- ③ **Terminal shrouds**
  - For use when the switch-disconnector fuse is installed outside an enclosure or when the operating voltage is over 500 V AC
- ④ **Operating handle**
  - Padlockable in open position
- ⑤ **GS1AN●● Position signalling contacts**
  - Synchronized with the poles operation
- ⑥ **GS1AM●●● Early-break signalling contacts**
  - Activated before the poles are opened
- ⑦ **GS1AF●● Blown fuse signalling contacts**
  - A missing fuse is also indicated



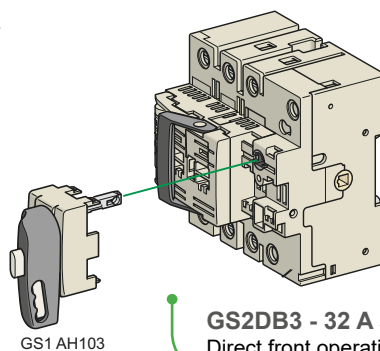
## Simplicity of the direct operating

The mounting of an operating handle directly on the side of the switch-disconnector fuse is a simple operation. This handle will be for use by qualified personnel only. As the mechanical design is simplified, the manoeuvre will be immediately understood by the operator. Each handle can be padlocked in open position. Locking device for 3 padlocks.

DB416395 eps



DB416396 eps



Position of the handle, a free choice

**GS2DB3 - 32 A switch-disconnector fuse**  
Direct front operating

**GS1JD3 - 100 A switch-disconnector fuse**  
Direct lateral operating

GS1 AH01  
GS1 AH02

Switch-disconnectors fuses

## Performance remote operating

Located on the front or side panel of an enclosure, the operating handle provide complementary features:

- simple (IP55) or reinforced (IP65) protection against dust
- intermediate "Test" position
- door interlock when the handle is in "Close" position, opening by mean of a special tool is needed for opening.
- optional key-operated handle lock

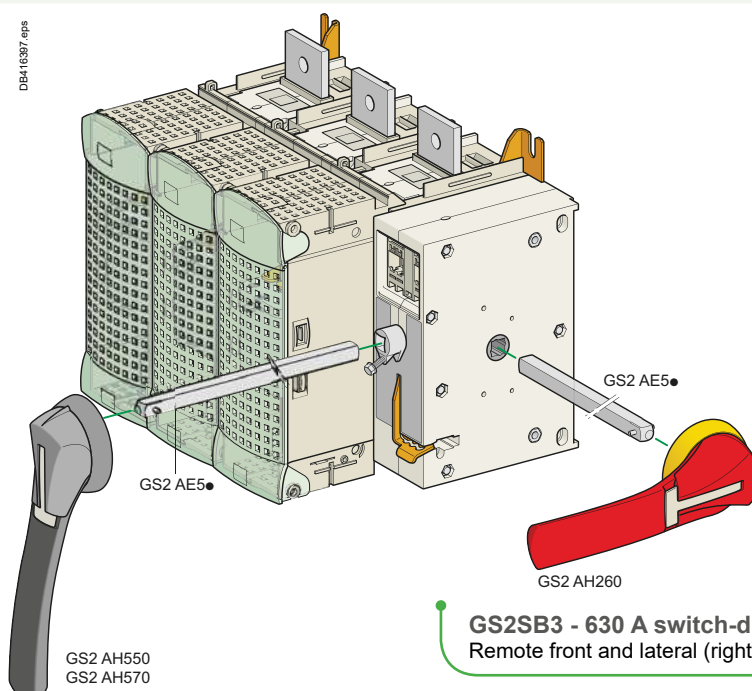


The handles are available in different lengths. They are chosen according the operating effort which depends on the rating of the switch-disconnector fuse.

The drive shaft can be cut to the ideal length.

The choice of a red and yellow handle (CNOMO standard) will identify an "Emergency Stop handle" among others handles, generally black and gray.

DB416397 eps







GS2 AH550  
GS2 AH570

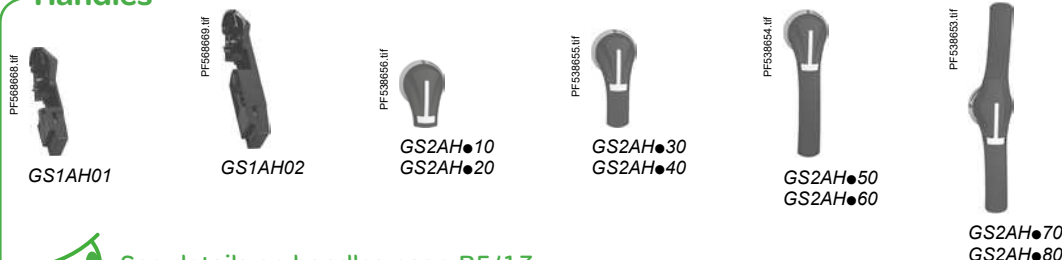
**GS2SB3 - 630 A switch-disconnector fuse**  
Remote front and lateral (right only) operating



## IEC - For NFC / DIN fuses - From 32 to 1250 A

																						
			GS1DD3		GS1FD3		GS1KD4															
Rating			A		32		50		63		100		125									
Number of poles			3		3+N		3		4		3		4									
Fuse size			10 x 38		14 x 51		Size 000		22 x 58		22 x 58											
For direct operators																						
Switch-disconnector fuses reference			GS1DD3		GS1DD4		GS1FD3		GS1FD4		GS1GD3		GS1GD4		GS1JD3		GS1JD4		GS1KD3		GS1KD4	
Handle			Black		GS1AH103		GS1AH01				GS1AH02											
Auxiliary contacts			O/I + Test		1NO + 1NC		-				GS1AN11											
					2NO + 2NC		-				GS1AN22											
			O/I + early break		GS1AM111 (1 OF)		GS1AM1 (1 OF)															
					GS1AM211 (2 OF)		GS1AM2 (2 OF)															
Blown fuse					-		GS1AF1		-		GS1AF23		GS1AF24		GS1AF23		GS1AF24					
For external left hand side-mounted operators																						
Switch-disconnector fuses reference			GS1DD3		GS1DD4		GS2FG3		GS2FG4		GS2GG3		GS2GG4		GS2JG3		GS2JG4		GS2KG3		GS2KG4	
Handle			Black/Grey		IP65		GS2AH310								GS2AH330							
			Red/Yellow		IP65		GS2AH320								GS2AH340							
Auxiliary contacts			O/I + Test		1NO + 1NC		-				GS1AN11G											
					2NO + 2NC		-				GS1AN22G											
			O/I + early break		1NO		GS1AM110															
					2NO		GS1AM101															
Blown fuse					-		GS1AF1		-		GS1AF23		GS1AF24		GS1AF23		GS1AF24					
For external front-mounted and right-hand side-mounted operators																						
Switch-disconnector fuses reference			GS1DD3		GS1DD4		GS2F3		GS2F4		GS2G3		GS2G4		GS2J3		GS2J4		GS2K3		GS2K4	
Front-mounted handle			Black/Grey		IP55		GS2AH515								GS2AH535							
			Black/Grey		IP65		GS2AH510								GS2AH530							
			Red/Yellow		IP65		GS2AH520								GS2AH540							
Front-mounted handle + Test position			Black/Grey		IP65		GS2AHT510								GS2AHT530							
			Red/Yellow		IP65		GS2AHT520								GS2AHT540							
RH side-mounted handle			Black/Grey		IP55		GS2AH215								GS2AH235							
			Black/Grey		IP65		GS2AH210								GS2AH230							
			Red/Yellow		IP65		GS2AH220								GS2AH240							
Auxiliary contacts			O/I + Test		1NO + 1NC		-				GS1AN11											
					2NO + 2NC		-				GS1AN22											
					1NO + 1NC + test		-				GS1ANT11											
					2NO + 2NC + test		-				GS1ANT22											
			O/I + Test + early break		1NO		-		GS1AM110													
					1NC		-		GS1AM101													
Blown fuse					-		GS1AF1		-		GS1AF23		GS1AF24		GS1AF23		GS1AF24					
Accessories																						
Shaft for external handle (mm)			200		GS2AE82		GS2AE22															
			320		GS2AE8		GS2AE2															
			400		GS2AE81		GS2AE21															
Terminal shroud					Integrated						GS1AP33 (3P), GS1AP34 (4P)											
Dimensions																						
			Direct front-mounted version		page B5/23		page B5/24															
			External front-mounted version		page B5/23		page B5/25															

### Handles







GS1KKD3



GS1LLD4



GS1ND3

125

3 4

Size 00

160

3 4 3 4

Size 00

250

3 4

Size 1

400

3 4

Size 2

630

3 4

Size 3

1250

3 4

Size 4

GS1KKD3 GS1KKD4 GS1LLD3 GS1LLD4 GS1LD3 GS1LD4 GS1ND3 GS1ND4 GS1QQD3 GS1QQD4 GS2S3 GS2S4 GS2V3 GS2V4  
 GS1AH02 GS2AH104 GS2AH105

GS1AN11 GS1AM110 (1 NO)

GS1AN22 GS1AM101 (1 NC)

GS1AM1 (1 OF) GS2AF63 GS2AF64 GS2AF73 GS2AF74

GS1AM2 (2 OF) GS1AF33 GS1AF34 GS1AF43 GS1AF44 GS1AF43 GS1AF44

GS2KKG3 GS2KKG4 GS2LLG3 GS2LLG4 GS2LG3 GS2LG4 GS2NG3 GS2NG4 GS2QQG3 GS2QQG4 GS2SG3 GS2SG4 GS2VG3 GS2VG4

GS2AH330 GS2AH350 GS2AH360

GS2AH340 GS1AN11G GS1AN22G

GS1AM110 GS1AM101

- GS1AF33 GS1AF34 GS1AF43 GS1AF44 GS1AF43 GS1AF44 GS2AF63 GS2AF64 GS2AF73 GS2AF74

GS2KK3 GS2KK4 GS2LL3 GS2LL4 GS2L3 GS2L4 GS2N3 GS2N4 GS2QQ3 GS2QQ4 GS2S3 GS2S4 GS2V3 GS2V4

GS2AH535 GS2AH530 GS2AH540 GS2AH550 GS2AH570

GS2AHT530 GS2AH560 GS2AH580

GS2AHT540 -

GS2AH235 -

GS2AH230 GS2AH250

GS2AH240 GS2AH260

GS1AN11

GS1AN22

GS1ANT11

GS1ANT22 -

GS1AM110 -

GS1AM101 -

- GS1AF33 GS1AF34 GS1AF43 GS1AF44 GS1AF43 GS1AF44 GS2AF63 GS2AF64 GS2AF73 GS2AF74

GS2AE22 GS2AE52

GS2AE2 GS2AE5

GS2AE21 GS2AE51

GS1AP33 (3P), GS1AP34 (4P) GS1AP43 (3P), GS1AP44 (4P) GS2AP73 GS2AP64 GS2AP83 GS2AP84

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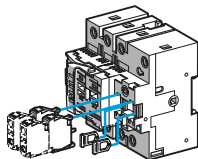
page B5/25

page B5/26

page B5/27

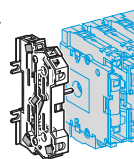
## Auxiliary contacts

DF588473 eps



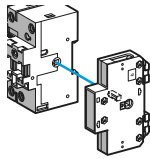
GS1AM1●●

DF588476 eps



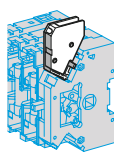
GS1AN●●●

DF588474 eps



GS1AM11

DF588475 eps



GS1AM●



See details on auxiliary contacts, page B5/12.

## Maximal number of auxiliary contacts

Switch rating (A)	Standard configuration	With additional bracket	Reference of additional bracket
30...32	4	4	GS1AD10 <sup>(1)</sup>
32...400	4	4	GS2AD20 <sup>(2)</sup>
200...400	8	8	GS2AD20 <sup>(2)</sup>
630...1250	8	-	-

<sup>(1)</sup> Only compatible with switch disconnector fuses starting by GS1D●●

<sup>(2)</sup> Only compatible with switch disconnector fuses starting by GS2●●●



## IEC - For BS fuses - From 32 to 1250 A



GS1DDB3



GS2JB3

Rating	A	32	63	100	160
Number of poles		3 3+N	3 4	3 4	3 4
Fuse size		A1	A1	A2-A3 A4	A4 B1-B2

### For direct operators

Switch-disconnector fuses reference	GS1DDB3	GS1DDB4	-
Handle	Black	GS1AH103	-
Auxiliary contacts	O/I + Test	1NO + 1NC	-
		2NO + 2NC	-
	O/I + early break	GS1AM111 (1 OF)	-
		GS1AM211 (2 OF)	-

### For external front-mounted and right-hand side-mounted operators

Switch-disconnector fuses reference	GS1DDB3	GS1DDB4	GS2DB3	GS2DB4	GS2GB3	GS2GB4	GS2JB3	GS2JB4	GS2LLB3	GS2LLB4	GS2LB3	GS2LB4
Front-mounted handle	Black/Grey IP55	GS2AH515					GS2AH535					
	Black/Grey IP65	GS2AH510					GS2AH530					
	Red/Yellow IP65	GS2AH520					GS2AH540					
Front-mounted handle + Test position	Black/Grey IP55	GS2AHT510					GS2AHT530					
	Red/Yellow IP65	GS2AHT520					GS2AHT540					
RH side-mounted handle	Black/Grey IP55	GS2AH215					GS2AH235					
	Black/Grey IP65	GS2AH210					GS2AH230					
	Red/Yellow IP65	GS2AH220					GS2AH240					
Auxiliary contacts	O/I + Test	1NO + 1NC	-	GS1AN11								
		2NO + 2NC	-	GS1AN22								
		1NO + 1NC + test	-	GS1ANT11								
		2NO + 2NC + test	-	GS1ANT22								
	O/I + Test + early break	1NO	GS1AM110 - max 4 contacts									
		1NC	GS1AM101 - max 4 contacts									

### Accessories

Shaft for external handle (mm)	200	GS2AE82	GS2AE22
	320	GS2AE8	GS2AE2
	400	GS2AE81	GS2AE21
Terminal shroud	Integrated	GS1AP33 (3P), GS1AP34 (4P)	

### Dimensions

Direct front-mounted version	page B5/23	page B5/24
External front-mounted version	page B5/23	page B5/25





GS2MMB3



GS2SB3

	200		250		315		400		630		800		1250	
	3	4	3	4	3	4	3	4	3	4	3	4	3	4
	B1-B2		B1...B3		B1...B3		B1...B4		C1-C2		C1...C3		D1	
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Switch-disconnectors  
fuses



# TeSys

## TeSys GS Switch-disconnector-fuses

### Product references


#### UL - For CC and J fuses - From 32 to 800 A



GS1DU3



GS2GU3N

Rating			30 Compact		30		60		100		
Number of poles			3		3		3		3		
Fuse size			CC	J	CC	J	J	J			
For direct operators											
Switch-disconnector fuses reference			GS1DDU3	GS1DU3	-						
Handle	Black		GS1AH106	-	-						
Auxiliary contacts	O/I + Test	1NO + 1NC	-								
		2NO + 2NC	-								
	O/I + early break	1NO	GS1AM110 + GS1AD10			-					
		1NC	GS1AM101 + GS1AD10			-					
For external front-mounted operators											
Switch-disconnector fuses reference			GS1DDU3	GS1DU3	GS2EEU3	GS2EU3N	GS2GU3N	GS2JU3N			
Front-mounted handle	Black/Grey	1,3R, 12	GS2AH110		GS2AH130						
		4, 4X	GS2AH410		GS2AH430						
	Red/Yellow	1,3R, 12	GS2AH120		GS2AH140						
		4, 4X	GS2AH420		GS2AH440						
Front-mounted handle + Test position	Black/Grey	1,3R, 12	GS2AHT110		GS2AHT130						
		4, 4X	GS2AHT410		GS2AHT430						
	Red/Yellow	1,3R, 12	GS2AHT120		GS2AHT140						
		4, 4X	GS2AHT420		GS2AHT440						
Auxiliary contacts	O/I + Test	1NO + 1NC	-		GS1AN11						
		2NO + 2NC	-		GS1AN22						
		1NO + 1NC + test	-		GS1ANT11						
		2NO + 2NC + test	-		GS1ANT22						
	O/I + Test + early break	1NO	GS1AM110 - max 4 contacts <sup>(1)</sup>		GS1AM110 - max 4 contacts <sup>(1)</sup>						
		1NC	GS1AM101 - max 4 contacts <sup>(1)</sup>		GS1AM101 - max 4 contacts <sup>(1)</sup>						
Accessories											
Shaft for external handle (mm)	320	GS2AE8		GS2AE2							
	400	GS2AE81		GS2AE21							
Terminal shroud		Integrated									
Dimensions											
	Direct front-mounted version		page B5/23					page B5/24			
	External front-mounted version		page B5/23					page B5/25			

<sup>(1)</sup> 4 more contacts allowed with GS1AD10 additional bracket.





GS2QU3N



GS2TU3

	200	400	600	800
	3	3	3	3
	J	J	J	J
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-
	GS2MU3N	GS2QU3N	GS2SU3	GS2TU3
	GS2AH130		-	
	GS2AH430		GS2AH150	
	GS2AH140		-	
	GS2AH440		GS2AH160	
	GS2AHT130		-	
	GS2AHT430		-	
	GS2AHT140		-	
	GS2AHT440		-	
	GS1AN11			
	GS1AN22			
	GS1ANT11		-	
	GS1ANT22		-	
	GS1AM110 - max 8 contacts <sup>(1)</sup>		GS1AM110 - max 8 contacts only	
	GS1AM101 - max 8 contacts <sup>(1)</sup>		GS1AM101 - max 8 contacts only	
	GS2AE2		GS2AE5	
	GS2AE21		GS2AE51	
	GS2AP43	GS2AP53	GS2AP73	
	page B5/24		page B5/26	
	page B5/25		page B5/27	



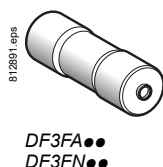
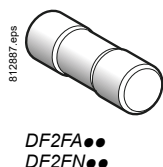
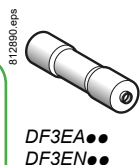
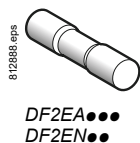
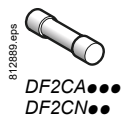
Switch-  
disconnectors  
fuses



# TeSys

## TeSys GS Switch-disconnector-fuses

### Product references



NFC Cartridge fuses - Type aM / gG - From 0.16 to 125 A							
Fuse type	Maximum rated voltage	Rating	Sold in lots of	Fuses without striker		Fuses with striker	
				Unit reference		Unit reference	
	V ~	A		aM	gG	aM	gG
Cylindrical 8.5 x 31.5	400	1	10	DF2BA0100	DF2BN0100	-	-
		2	10	DF2BA0200	DF2BN0200	-	-
		4	10	DF2BA0400	DF2BN0400	-	-
		6	10	DF2BA0600	DF2BN0600	-	-
		8	10	DF2BA0800	DF2BN0800	-	-
		10	10	DF2BA1000	DF2BN1000	-	-
		12	10	-	DF2BN1200	-	-
		16	10	-	DF2BN1600	-	-
		20	10	-	DF2BN2000	-	-
Cylindrical 10 x 38	500	0.16	10	DF2CA001	-	-	-
		0.25	10	DF2CA002	-	-	-
		0.50	10	DF2CA005	-	-	-
		1	10	DF2CA01	-	-	-
		2	10	DF2CA02	DF2CN02	-	-
		4	10	DF2CA04	DF2CN04	-	-
		6	10	DF2CA06	DF2CN06	-	-
		8	10	DF2CA08	DF2CN08	-	-
		10	10	DF2CA10	DF2CN10	-	-
		12	10	DF2CA12	DF2CN12	-	-
		16	10	DF2CA16	DF2CN16	-	-
		20	10	-	DF2CN20	-	-
		400	20	DF2CA20	-	-	-
			25	DF2CA25	DF2CN25	-	-
			32	DF2CA32	DF2CN32	-	-
Cylindrical 14 x 51	690	0.25	10	DF2EA002	-	-	-
		0.50	10	DF2EA005	-	-	-
	500	1	10	DF2EA01	-	-	-
		2	10	DF2EA02	-	DF3EA02	-
		4	10	DF2EA04	DF2EN04	DF3EA04	DF3EN04
		6	10	DF2EA06	DF2EN06	DF3EA06	DF3EN06
		8	10	DF2EA08	-	DF3EA08	-
		10	10	DF2EA10	DF2EN10	DF3EA10	DF3EN10
		12	10	DF2EA12	-	DF3EA12	-
		16	10	DF2EA16	DF2EN16	DF3EA16	DF3EN16
		20	10	DF2EA20	DF2EN20	DF3EA20	DF3EN20
		25	10	DF2EA25	DF2EN25	DF3EA25	DF3EN25
		32	10	DF2EA32	DF2EN32	DF3EA32	DF3EN32
		40	10	DF2EA40	DF2EN40	DF3EA40	DF3EN40
	400	50	10	DF2EA50	DF2EN50	DF3EA50	-
Cylindrical 22 x 58	690	4	10	DF2FA04	-	DF3FA04	-
		6	10	DF2FA06	-	DF3FA06	-
		8	10	DF2FA08	-	DF3FA08	-
		10	10	DF2FA10	DF2FN10	DF3FA10	DF3FN10
		16	10	DF2FA16	-	DF3FA16	-
		20	10	DF2FA20	DF2FN20	DF3FA20	DF3FN20
		25	10	DF2FA25	DF2FN25	DF3FA25	DF3FN25
		32	10	DF2FA32	DF2FN32	DF3FA32	DF3FN32
		40	10	DF2FA40	DF2FN40	DF3FA40	DF3FN40
		50	10	DF2FA50	DF2FN50	DF3FA50	DF3FN50
		500	63	DF2FA63	DF2FN63	DF3FA63	DF3FN63
			80	DF2FA80	DF2FN80	DF3FA80	DF3FN80
			100	DF2FA100	DF2FN100	DF3FA100	DF3FN100
	400	125	10	DF2FA125	-	DF3FA125	-



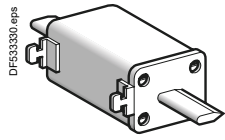
For protection of equipment with current peaks  
For protection of circuits without significant current peaks



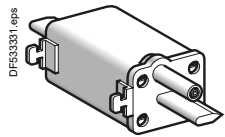
# TeSys

## TeSys GS Switch-disconnector-fuses

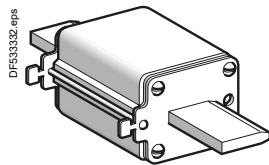
### Product references



DF2GA.....  
DF2GN.....



DF4GA.....  
DF4GN.....



DF2JA.....  
DF2JN.....

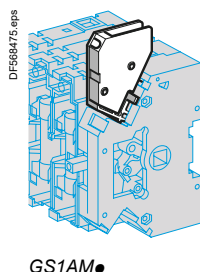
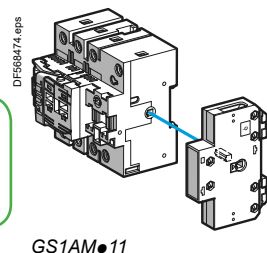
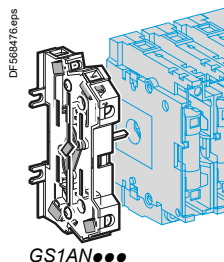
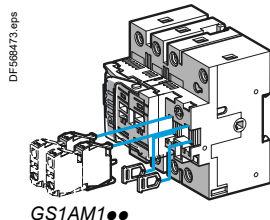
DIN Cartridge fuses - Type aM /gG - From 10 to 1250 A								
Fuse type	Maximum rated voltage	Rating	Sold in lots of		Fuses without striker		Fuses with striker	
					Unit reference		Unit reference	
	V ~	A	aM	gG	aM	gG	aM	gG
Blade size 000	690	10	-	10	-	DF2FGN10	-	-
		16	3	10	DF2FGA16	DF2FGN16	-	-
		20	3	10	DF2FGA20	DF2FGN20	-	-
		25	3	10	DF2FGA25	DF2FGN25	-	-
		32	3	10	DF2FGA32	DF2FGN32	-	-
		40	3	10	DF2FGA40	DF2FGN40	-	-
		50	3	10	DF2FGA50	DF2FGN50	-	-
		63	3	10	DF2FGA63	DF2FGN63	-	-
Blade size 00	690	80	-	10	-	DF2FGN80	-	-
		80	3	-	DF2FGA80	-	-	-
		100	3	10	DF2FGA100	DF2FGN100	-	-
		125	3	10	DF2FGA125	DF2FGN125	-	-
Blade size 0	690	160	-	10	-	DF2FGN160	-	-
		50	3	3	DF2GA1051	DF2GN1051	-	-
		63	3	3	DF2GA1061	DF2GN1061	-	-
		80	3	3	DF2GA1081	DF2GN1081	-	-
		100	3	3	DF2GA1101	DF2GN1101	-	-
		125	3	3	DF2GA1121	DF2GN1121	DF4GA1121	-
		160	3	3	DF2GA1161	DF2GN1161	DF4GA1161	-
		500	125	-	3	-	-	DF4GN1121
Blade size 1	690	160	-	3	-	-	-	DF4GN1161
		200	3	-	DF2GA1201	-	DF4GA1201	-
		160	3	3	DF2HA1161	DF2HN1161	-	-
		200	3	3	DF2HA1201	DF2HN1201	DF4HA1201	DF4HN1201
Blade size 2	690	250	3	-	DF2HA1251	-	DF4HA1251	-
		500	250	-	3	-	DF2HN1251	-
		315	3	-	DF2HA1311	-	DF4HA1311	-
		250	3	3	DF2JA1251	DF2JN1251	-	-
Blade size 3	690	315	3	3	DF2JA1311	DF2JN1311	DF4JA1311	DF4JN1311
		400	3	-	DF2JA1401	-	DF4JA1401	-
		500	400	-	3	-	DF2JN1401	-
		500	3	-	DF2JA1501	-	DF4JA1501	-
Blade size 4	690	400	3	-	DF2KA1401	-	-	-
		500	3	3	DF2KA1501	-	DF4KA1501	DF4KN1501
		500	-	3	-	DF2KN1501	-	-
		630	3	3	DF2KA1631	DF2KN1631	DF4KA1631	DF4KN1631
Blade size 5	690	800	1	3	DF2LA1801	-	DF4LA1801	DF4LN1801
		1000	1	-	DF2LA1101	-	DF4LA1101	-
		800	-	1	-	DF2LN1801	-	-
		1000	-	1	-	DF2LN1101	-	DF4LN1101
		1250	1	1	DF2LA1251	DF2LN1251	DF4LA1251	DF4LN1251

Switch-disconnectors fuses



For protection of equipment with current peaks  
For protection of circuits without significant current peaks





## Auxiliary contacts for IEC and UL switch-disconnector-fuses

### Auxiliary early break and/or O, I and Test position signalling contacts <sup>(1) (2) (3)</sup>

Switch rating	Contact type	Type of operator	Rated operating current I <sub>e</sub> (A)		Reference
A (CEI)	A (UL)		< 24 V DC	< 240 V AC	
32...1250	30 Compact	1 N/O	2.8	3	GS1AM110
	30...800	1 N/C	2.8	3	GS1AM101

### Auxiliary O, I and Test position signalling contacts <sup>(3) (5)</sup>

Switch rating	Contact type	Type of operator	Rated operating current I <sub>e</sub> (A)		Reference
A (CEI)	A (UL)		< 24 V DC	< 240 V AC	

### Auxiliary O and I position signalling contacts

50...1250	30...800	1 N/C + 1 N/O	External, front or RH side-mounted Direct	–	10	GS1AN11
			External, LH side	–	10	GS1AN11G*
		2 N/C + 2 N/O	External, front or RH side-mounted Direct	–	10	GS1AN22
			External, LH side	–	10	GS1AN22G*

### Auxiliary O, I and Test position signalling contacts <sup>(3)</sup>

50...400	30...400	1 N/C + 1 N/O	External, front side-mounted	–	10	GS1ANT11
		2 N/C + 2 N/O	External, front side-mounted	–	10	GS1ANT22

### Auxiliary early break O and I position signalling contacts

Switch rating	Contact type	Type of operator	Rated operating current I <sub>e</sub> (A)		Reference
A (CEI)			< 24 V DC	< 240 V AC	
32	1 C/O	–	12	4	GS1AM111*
	2 C/O	–	12	4	GS1AM211*
50...400	1 C/O	Direct, RH side	12	4	GS1AM1*
	2 C/O	Direct, RH side	12	4	GS1AM2*

### Auxiliary "blown fuse" signalling contacts for use with NF C and DIN fuses <sup>(6)</sup>

Contact type	Switch rating	Fuse size	Number of poles	Rated operating current I <sub>e</sub> (A)		Reference
	A (CEI)			< 24 V DC	< 240 V AC	
1 <sup>st</sup> C/O	50	14 x 51	3 or 4	12	4	GS1AF1*
	100 and 125	22 x 58	3	12	4	GS1AF23*
			4	12	4	GS1AF24*
	160	Size 0	3	12	4	GS1AF33*
			4	12	4	GS1AF34*
	250 and 400	Size 1 and Size 2	3	12	4	GS1AF43*
			4	12	4	GS1AF44*
	630	Size 3	3	12	4	GS2AF63*
			4	12	4	GS2AF64*
	1250	Size 4	3	12	4	GS2AF73*
			4	12	4	GS2AF74*
2 <sup>nd</sup> C/O	50...1250	–	3 or 4	12	4	GS1AF*

(\*) Not for UL switch-disconnector.

(1) For 32 A (CEI), 30 (UL) switch-disconnector-fuses, these auxiliary contacts allow:

- early break and O and I position signalling,
- O, I and Test position signalling,
- Test position signalling.

For 50 to 400 A (CEI), 30-400 A (UL) switch-disconnector-fuses, they allow:

- early break,
- O and I position signalling,
- Test position signalling.

For 630 and 1250 A (CEI), 630 and 800 A (UL) switch-disconnector-fuses, they allow:

- early break and O and I position signalling,

(2) Maximum number of auxiliary contacts:

Switch rating	Standard	With additional bracket	Reference of additional bracket
A (CEI)	A (UL)		
32 <sup>(7)</sup>	30 Compact	CC 4	4 + 4
		J 2	2 + 4
32 <sup>(8)</sup> ...160	30...100	4	4 + 4
200...400	200 and 400	8	8 + 4
630...1250	600 and 800	8	8

(3) The Test position allows testing of the control circuits off-load. Auxiliary contacts GS1AM110, GS1AM101 and GS1ANT●● only allow the test function with external handles GS2AHT●●●.

(4) These auxiliary contacts can also be used with 630, 800 and 1250 A switch-disconnector-fuses fitted with a direct front-mounted operator.

(5) Reversible add-on attachments for converting an N/C contact to an N/O contact and vice versa.

(6) For striker fuses (BS fuses are not available with striker).

(7) For GS1DDB3 fuse switch disconnector only.

(8) For 32 A: for fuse switch disconnector GS2DB3 only.





## Handles for IEC and UL switch-disconnector-fuses

### Handles for direct operators

Switch rating		Type of operator	Handle colour	Reference
A (CEI)	A (UL)			
Handles for direct operators, padlockable				
-	30 Compact	Front-mounted	Black	GS2AH106
32	-	Front	Black	GS1AH103
50 and 63	-	RH side	Black	GS1AH01
100...400	-	RH side	Black	GS1AH02
-	600 and 800	Front-mounted	Black	GS2AH107
630 and 800	-	Front	Black	GS2AH104
1250	-	Front	Black	GS2AH105

### Handles for external operator

Switch rating		Handle colour	Degree of protection	Protection index Nema	Reference
A (CEI)	A (UL)				
Handles for front-mounted external operators, padlockable and lockable in position O <sup>(1)</sup>					
Door interlock in I position <sup>(2)</sup>					
32...63	-	Black/Grey	IP 65	—	GS2AH510
			IP55	—	GS2AH515
		Red/Yellow	IP 65	—	GS2AH520
100...400	-	Black/Grey	IP 65	—	GS2AH530
			IP55	—	GS2AH535
		Red/Yellow	IP 65	—	GS2AH540
630 and 800	-	Black/Grey	IP65	—	GS2AH550
		Red/Yellow	IP65	—	GS2AH560
1250	-	Black/Grey	IP65	—	GS2AH570
		Red/Yellow	IP65	—	GS2AH580
-	30 Compact	Black/Grey	—	1, 3R, 12	GS2AH110
		Red/Yellow	—	1, 3R, 12	GS2AH120
		Black/Grey	—	1, 3R, 4, 4X, 12	GS2AH410
		Red/Yellow	—	1, 3R, 4, 4X, 12	GS2AH420
-	30...400	Black/Grey	—	1, 3R, 12	GS2AH130
		Red/Yellow	—	1, 3R, 12	GS2AH140
		Black/Grey	—	1, 3R, 4, 4X, 12	GS2AH430
		Red/Yellow	—	1, 3R, 4, 4X, 12	GS2AH440
-	600 and 800	Black/Grey	—	1, 3R, 12	GS2AH150
		Red/Yellow	—	1, 3R, 12	GS2AH160

### Handles for front-mounted external operators with test facility <sup>(3)</sup>, padlockable and lockable in "O" position <sup>(1)</sup>. Door interlock in "I" position <sup>(2)</sup>

32...63	-	Black/Grey	IP 65	-	GS2AHT510
		Red/Yellow	IP65	-	GS2AHT520
100...400	-	Black/Grey	IP65	-	GS2AHT530
		Red/Yellow	IP65	-	GS2AHT540
-	30 Compact	Black/Grey	-	1, 3R, 12	GS2AHT110
		Red/Yellow	-	1, 3R, 12	GS2AHT120
		Black/Grey	-	1, 3R, 4, 4X, 12	GS2AHT410
		Red/Yellow	-	1, 3R, 4, 4X, 12	GS2AHT420
-	30...400	Black/Grey	-	1, 3R, 12	GS2AHT130
		Red/Yellow	-	1, 3R, 12	GS2AHT140
		Black/Grey	-	1, 3R, 4, 4X, 12	GS2AHT430
		Red/Yellow	-	1, 3R, 4, 4X, 12	GS2AHT440

### Handles for external right-hand side-mounted operators, padlockable and lockable in "O" position <sup>(1)</sup>

32...63	-	Black/Grey	IP 65	-	GS2AH210
		Red/Yellow	IP55	-	GS2AH215
		Red/Yellow	IP65	-	GS2AH220
100...400	-	Black/Grey	IP65	-	GS2AH230
		Red/Yellow	IP55	-	GS2AH235
		Red/Yellow	IP65	-	GS2AH240
630...1250	-	Black/Grey	IP65	-	GS2AH250
		Red/Yellow	IP65	-	GS2AH260

### Handles for external left-hand side-mounted operators, padlockable and lockable in "O" position <sup>(1)</sup>

32...63	-	Black/Grey	IP 65	-	GS2AH310
		Red/Yellow	IP65	-	GS2AH320
100...400	-	Black/Grey	IP65	-	GS2AH330
		Red/Yellow	IP65	-	GS2AH340
630...1250	-	Black/Grey	IP65	-	GS2AH350
		Red/Yellow	IP65	-	GS2AH360

<sup>(1)</sup> Lockable with device **GS2AX1**, to be ordered separately.

<sup>(2)</sup> Door interlock override by means of a tool.

<sup>(3)</sup> The Test facility allows testing of the control circuits off-load, by using auxiliary contacts **GS1AM110**, **GS1AM101** or **GS1ANT●●**. In the "Test" position, the enclosure door can be opened.



## Accessories for IEC and UL switch-disconnector fuses

## Shafts for external operators

Switch rating A (CEI)	A (UL)	Shaft length mm	Shaft cross section mm	Reference
32	30 Compact	200	5 x 5	GS2AE82
		320	5 x 5	GS2AE8
		400	5 x 5	GS2AE81
50...400	30...400	200	10 x 10	GS2AE22
		320	10 x 10	GS2AE2
		400	10 x 10	GS2AE21
630...1250	600 and 800	200	12 x 12	GS2AE52
		320	12 x 12	GS2AE5
		40	12 x 12	GS2AE51

## Terminal protection shrouds for upstream or downstream connector plates

Switch rating A (CEI)	A (UL)	Number of poles	Reference
50 and 63	30 Compact, 30...60 (3P)	3 or 4	(1)
100...160	100	3	GS1AP33
	—	4	GS1AP34
200...400	200	3	GS1AP43
	—	4	GS1AP44
—	400	3	GS1APU53
630...800	600 and 800	3	GS2AP73
	—	4	GS2AP64
1250	—	3	GS2AP83
	—	4	GS2AP84

## Devices for locking fuse covers in "I" position (2)

Switch rating A	Fuse size	Number of poles	Reference
50	14 x 51	3 or 4	(3)
63	Size 00C	3 or 4	GS1AV1
100...160	22 x 58, Size 00	3 or 4	GS1AV2
160	Size 0	3	GS1AV33
		4	GS1AV34
250	Size 1	3	GS1AV53
		4	GS1AV54
400	Size 2	3	GS1AV73
		4	GS1AV74

## Cage terminals for connection of bare cables (without lug)

Switch rating A	Number of poles	Reference
50 and 63	3 or 4	(4)
100...160	3	GS1AW33
	4	GS1AW34
200...250	3	GS1AW43
	4	GS1AW44

## External handle locking device

Switch rating A	Description	Reference
32...1250	Device for RONIS EL11AP keylock (lock to be ordered separately).	GS2AX1

## Height compensation plate for external handles

Switch rating A (CEI)	A (UL)	Description	Degree of protection	Reference
32...1250	30 Compact, 30...400	Allows a new GS2●● handle to be fitted on existing cut-outs	IP 65	GS2AH001

## Flat mounting kit

Switch rating A	Description	Reference
50...400	The kit, for use with a front-mounted external handle, includes: ■ a 200 mm shaft, cross section 10 x 10 mm, ■ an adapter plate	GS2ADL2

(1) For these ratings, the switch-disconnector-fuses are fitted with terminal covers as standard.

(2) For NF C and DIN switch-disconnector-fuses fitted with right-hand mounted direct operator.

(3) For this rating, switch-disconnector-fuses are fitted with a cover locking device as standard.

(4) For these ratings, switch-disconnector-fuses are fitted with cage terminals as standard.



GS2AE5



GS2AE2 - GS2AE21



GS2AE8 - GS2AE81



## Technical Data for Designers

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#### Characteristics:

- > switch-disconnector fuses.... B5/16 to B5/21
- > auxiliary contacts .....B5/22

Dimensions ..... B5/23 to B5/31

Schemes .....B5/31



# TeSys

## TeSys GS Switch-disconnector-fuses

### Characteristics

#### IEC - For NFC / DIN fuses - From 32 to 1250 A

##### Switch-disconnector-fuse characteristics

Type			GS1DD		GS●F	GS●G	GS●J
Environment							
Conforming to standards	Switch-disconnector-fuses		IEC 60947-3				
	Fuses		IEC 60269-1 and 2				
Product certifications			ASEFA/LOVAG, LROS (pending)				
Degree of protection conforming to IEC 60529	On front panel with terminal covers		IP 20				
Ambient air temperature around the device	Storage	°C	-40...+80				
	Operation	°C	-20...+70				
Flame resistance conforming to IEC 60695-2-1	Body	°C	960	960			
	Fuse cover	°C	–	850			
Pole characteristics							
Conventional thermal current (I <sub>th</sub> ) for ambient temperature ≤ 40 °C		A	32	50	63	100	
Fuse size			10 x 38	14 x 51	T00C	22 x 58	
Rated insulation voltage (U <sub>i</sub> )		V	800	750	750	750	
Rated impulse withstand voltage (U <sub>imp</sub> )		kV	8	8	8	8	
Rated operational current (I <sub>e</sub> )	Cat. AC-23A/B <sup>(1)</sup> ~ 400 V	A	32	50	63	100	
	~ 500 V	A	32	50	63	100	
	~ 690 V	A	32	50	63	100 <sup>(3)</sup>	
	Cat. DC-23A/B <sup>(1)</sup> --- 440 V <sup>(2)</sup>	A	20	40	40	100	
Rated operational power	Cat. AC-23A/B <sup>(1)</sup> ~ 400 V	kW	15	25	30	51	
	~ 500 V	kW	18.5	33	40	63	
	~ 690 V	kW	25	45	55	90	
Rated conditional short-circuit current	I rms at ~ 400 V with protection by gG (gl) fuses	kA	100	100	100	100	
	Rating of associated fuses	A	32	50	63	100	
Peak value of permissible current (dynamic short-circuit withstand)	Conforming to IEC 60269-1 ~ 400 V	kA	5.5	7.6	10.6	20	
Rated making capacity	I rms at 400 V Cat. AC-23B	A	320	500	630	1000	
Rated breaking capacity	I rms at 400 V Cat. AC-23B	A	256	400	500	800	
Mechanical durability	Number of operating cycles		20000	10000	10000	10000	
Electrical durability	Number of operating cycles cat. AC/DC-23A/B <sup>(1)</sup>		1500/300	1500/300	1500/300	1500/300	
Cabling	Cable (c.s.a. min/max)	mm²	2.5/16	6/25	10/25	25/95	
	Bars (max width)	mm	–	–	–	20	
Tightening torque		N.m	3	3.2	3.2	12	

<sup>(1)</sup> Category "A": frequent operating cycles, category "B": infrequent operating cycles.

<sup>(2)</sup> 2 poles in series per phase.

<sup>(3)</sup> With terminal covers.

<sup>(4)</sup> Poles not juxtaposed.



	GS●K	GS●KK	GS●LL	GS●L	GS●N	GS●QQ	GS2S	GS2V
	IEC 60947-3							
	IEC 60269-1 and 2							
	ASEFA/LOVAG, LROS (pending)							
	IP 20							
	-40...+80							
	-20...+70							
	960							
	850							
	125	125	160	160	250	400	630	1250
	22 x 58	T00	T00	T0	T1	T2	T3	T4
	750	750	750	750	750	800	1000	1000
	8	8	8	8	8	8	12	12
	125	125	160	160	250	400	630	1000
	125	125	160	160	250	315	500	800
	100 <sup>(3)</sup>	100 <sup>(3)</sup>	125 <sup>(3)</sup>	125 <sup>(3)</sup>	250 <sup>(3)</sup>	250/315	315/400	630
	100	100	125	125	200	200/315 <sup>(4)</sup>	400/630 <sup>(4)</sup>	1000
	63	63	80	80	132	220	355	560
	90	90	110	110	160	220	355	560
	80	80	110	110	220	220/295	295/400	400/475
	100	100	100 (50)	100	100	50	100	100
	125	125	125 (160)	160	250	400	630	1250
	20	20	22.7	20	32.5	40	70	90
	1250	1250	1600	1600	2500	4000	6300	10 000
	1000	1000	1280	1280	2000	3200	5040	8000
	10000	10000	10000	10000	10000	10000	8000	5000
	1000/200	1000/200	1000/200	1000/200	1000/200	1000/200	1000/200	500/100
	35/95	35/95	50/95	50/95	95/240	185/240	2 x 150 / 2 x 300	- / 4 x 185
	20	20	20	20	32	45	63	80
	12	12	12	12	25	25	44	44

Ref.

Switch-  
disconnectors  
fuses



# TeSys

## TeSys GS Switch-disconnector-fuses

### Characteristics

#### IEC - For BS fuses - From 32 to 1250 A

Switch-disconnector-fuse characteristics						
Type		GS1DDB		GS2DB	GS2GB	GS2JB
Environment						
Conforming to standards	Switch-disconnector-fuses		IEC 60947-3			
	Fuses		IEC 60269-1 and 2			
Product certifications			ASEFA/LOVAG, LROS (pending)			
Degree of protection conforming to IEC 60529	On Front panel, with terminal covers		IP 20			
Ambient air temperature around the device	Storage	°C	-40...+80			
	Operation	°C	-20...+70			
Flame resistance conforming to IEC 60695-2-1	Body	°C	960			
	Fuse cover	°C	–		850	
Pole characteristics						
Conventional thermal current (Ith) for ambient temperature ≤ 40 °C		A	32	32	63	100
Fuse size			A1	A1	A2-A3	A4 Ø ≤ 31 mm
Rated insulation voltage (Ui)		V	800	750	750	750
Rated impulse withstand voltage (Uimp)		kV	8	8	8	8
Rated operational current (Ie)	Cat. AC-23A/B <sup>(1)</sup> ~ 400 V	A	32	32	63	100
	~ 500 V	A	32	32	63	100
	~ 690 V	A	32	32	63	100 <sup>(4)</sup>
	Cat. DC-23A/B <sup>(1)</sup> --- 440 V <sup>(2)</sup>	A	20	20	40	100
Rated operational power	Cat. AC-23A/B <sup>(1)</sup> ~ 400 V	kW	15	15	30	51
	~ 500 V	kW	18.5	18.5	40	63
	~ 690 V	kW	25	25	55	90
Rated conditional short-circuit current	I rms at ~ 400 V with protection by gG (gl) fuses	kA	80	80	80	80
	Rating of associated fuses	A	32	32	63	100
Peak value of permissible current (dynamic short-circuit withstand)	Conforming to ~ 400 V IEC 60269-1	kA	5.5	9	10.6	20
Rated making capacity	I rms at 400 V Cat. AC-23B	A	320	320	630	1000
Rated breaking capacity	I rms at 400 V Cat. AC-23B	A	256	256	500	800
Mechanical durability	Number of operating cycles		20000	10000	10000	10000
Electrical durability	Number of operating cycles cat. AC/DC-23A/B <sup>(1)</sup>		1500/300	1500/300	1500/300	1500/300
Cabling	Cable (c.s.a. min/max)	mm²	2.5/16	6/25	10/25	25/95
	Bars (max width)	mm	–	–	–	20
Tightening torque		N.m	3	3.2	3.2	12

(1) Category "A": frequent operating cycles, category "B": infrequent operating cycles.

(2) 2 poles in series per phase.

(3) Fit switch-disconnector-fuses **GS2LB** with B1 or B2 fuses and **GS2LLB** with A4 fuses.

(4) With terminal covers.

(5) Poles not juxtaposed.



	GS2LB or LLB <sup>(3)</sup>	GS2MMB	GS2NB	GS2PPB	GS2QQB	GS2SB	GS2TB	GS2VB
	IEC 60947-3							
	IEC 60269-1 and 2							
	ASEFA/LOVAG, LROS (pending)							
	IP 20							
	-40...+80							
	-20...+70							
	960							
	850							
	160	200	250	315	400	630	800	1250
	A4. B1-B2 <sup>(3)</sup>	B1-B2	B1...B3	B1...B3	B1...B4	C1-C2	C1...C3	D1
	750	750	750	800	800	1000	1000	1000
	8	8	8	8	8	12	12	12
	160	200	250	315	400	630	800	1000
	160	200	250	315	315	500	630	800
	125 <sup>(4)</sup>	200/160 <sup>(4)</sup>	250 <sup>(4)</sup>	250/315 <sup>(4)</sup>	250/315	315/400	630	630
	125	200	200	200	200/315 <sup>(5)</sup>	400/630 <sup>(5)</sup>	800	1000
	80	100	132	150	220	355	450	560
	110	140	160	220	220	355	450	560
	110	150/185	220	220/295	220/295	295/400	400	400/475
	80	80	80	80	80	80	80	80
	160	200	250	315	400	630	800	1250
	22.7	32.5	32.5	40	40	70	80	90
	1600	2000	2500	3150	4000	6300	8000	10 000
	1280	1600	2000	2520	3200	5040	6400	8000
	10000	10000	10000	10000	10000	8000	8000	5000
	1000/200	1000/200	1000/200	1000/200	1000/200	1000/200	500/100	500/100
	50/95	95/240	95/240	185/240	185/240	2 x 150 / 2 x 300	2 x 185 / 2 x 300	- / 4 x 185
	20	32	32	45	45	63	63	80
	12	25	25	25	25	44	44	44



# TeSys

## TeSys GS Switch-disconnector-fuses

### Characteristics

#### UL, CSA, IEC - For CC and J fuses - From 32 to 800 A

Switch-disconnector-fuse characteristics							
Type			GS1DDU3		GS1DU3	GS2EEU3	GS2EU3N
Environment							
Conforming to standards	Switch-disconnector-fuses		UL 489, CSA 22.2 n°5, IEC 60947-3			UL 98, UL 248, CSA 22.2 n°4, IEC 60947-3	
	Fuses		UL 248				
Degree of protection conforming to IEC 60529	With terminal covers		IP 20				
Ambient air temperature around the device	Storage	°C	-40...+80				
	Operation	°C	-20...+70				
Flame resistance conforming to IEC 60695-2-1	Body	°C	960	960	960		
	Fuse cover	°C	–	–	850		
Pole characteristics							
Conventional thermal current (Ith) for ambient temperature ≤ 40 °C		A	30	30	30	30	
Fuse size			CC	J	CC	J	
Rated insulation voltage (Ui)		V	800	800	750	750	
Rated impulse withstand voltage (Uimp)		kV	8	8	8	8	
Rated operational current (Ie)	Cat. AC-23A/B <sup>(1)</sup> ~ 400 V	A	32	32	32	32	
	~ 500 V	A	32	32	32	32	
	~ 690 V	A	32	32	32	32	
Rated operational power	Cat. AC-23A/B <sup>(1)</sup> ~ 400 V	kW	15	15	15	15	
	~ 500 V	kW	18.5	18.5	18.5	18.5	
	~ 690 V	kW	25	25	25	25	
Prospective short-circuit current withstand	Conforming to UL 98 / UL 489	~ 600 V	kA	100	100	200	
Peak value of permissible current (dynamic short-circuit withstand)	Conforming to IEC 60269-1	~ 400 V	kA	5.5	5.5	7.6	
Rated making capacity	I rms at 400 V Cat. AC-23B	A	300	300	300	300	
Rated breaking capacity	I rms at 400 V Cat. AC-23B	A	240	240	240	240	
Mechanical durability	Number of operating cycles		10000	10000	10000	10000	
Electrical durability	Number of operating cycles Cat. AC/DC-23A/B <sup>(1)</sup>		1500/300	1500/300	1500/300	1500/300	
Cabling	Cable (c.s.a. min/max)	mm²	2.5/6	2.5/6	2.5/6	2.5/16	
		AWG	#14/#10	#14/#10	#14/#10	#14/#6	
	Bars (max width)	mm	-	-	-	-	
Tightening torque		N.m	3 (for wire)	4 (for wire)	5.5 (for wire)	3.5 (for wire)	
		lb-in	27	27	48	31	

<sup>(1)</sup> Category "A": frequent operating cycles, category "B": infrequent operating cycles.



	GS2GU3N	GS2JU3N	GS2MU3N	GS2QU3N	GS2SU3	GS2TU3
	UL 98, CSA 22.2 n°4, IEC 60947-3					
	UL 248					
	IP 20					
	-40...+80					
	-20...+70					
	960					
	850					
	60	100	200	400	600	800
	J	J	J	J	J	L
	750	750	750	800	1000	1000
	8	8	8	8	12	12
	63	100	200	400	630	800
	63	100	200	315	630	630
	63	100	200	250	630	630
	30	51	100	220	355	450
	40	63	140	220	450	560
	55	90	185	220	600	600
	100	200	200	200	200	200
	17.6	22	32	36	80	80
	600	1000	2000	4000	6000	8000
	480	800	1600	3200	4800	6400
	10000	10000	8000	6000	5000	5000
	1500/300	1500/300	1000/200	1000/200	1000/200	500/100
	2.5/16	4/50	16/150	25/300	2 x 150	—
	#14/#6	#12/#1	#6/300 Kcmil	#4/600 Kcmil	#2/600 Kcmil	—
	-	20	32	45	100	100
	3.5 (for wire)	4 (for wire)	18 (for lug)	35 (for lug)	35 (for lug)	35 (for lug)
	31	35.4	160	310	310	310

Ref.

Switch-  
disconnectors  
fuses



## Auxiliary contacts

### GS1AM11, GS1AM1 and GS1AM2 early break and signalling contact characteristics

Conventional thermal current (I <sub>th</sub> ) for ambient temperature ≤ 40 °C		<b>A</b>	16
Rated operational current (I <sub>e</sub> )	Cat. AC-15	<b>A</b>	127 V: 5 - 230 V: 4 - 400 /415 V: 3 - 440 V: 2
	Cat. DC-13	<b>A</b>	24 V: 12 - 48 V: 2 - 110 V: 0.6 - 220 V: 0.4
Durability	Number of operating cycles		Mechanical: 1000000 Electrical: cat. AC-15: 30000
Fuse protection	gG	<b>A</b>	6 max
Cabling		<b>mm</b>	Faston connectors: 1 x 6.35 or 2 x 2.8

### GS1AN and GS1ANT signalling contact characteristics

Conventional thermal current (I <sub>th</sub> ) for ambient temperature ≤ 40 °C		<b>A</b>	20
Rated operational current (I <sub>e</sub> )	Cat. AC-15	<b>A</b>	127 V: 12 - 230 V: 10 - 400/415 V: 8 - 440 V: 6
	Cat. DC-13	<b>A</b>	48 V: 4 - 110 V: 1.2 - 220 V: 1
Durability	Number of operating cycles		Mechanical: 30000 Electrical: cat. AC-15: 30000
Fuse protection	gG	<b>A</b>	16 max
Cabling	Cable (c.s.a. min/max)	<b>mm<sup>2</sup></b>	Min: 1.5 - max: 10

### GS1AM110 and GS1AM101 early break and signalling contact characteristics

Conventional thermal current (I <sub>th</sub> ) for ambient temperature ≤ 40 °C		<b>A</b>	10
Rated operational current (I <sub>e</sub> )	Cat. AC-15	<b>A</b>	120 V: 6 - 240 V: 3 - 400 V: 1.8 - 480 V: 1.5
	Cat. DC-13	<b>A</b>	24 V: 2.8 - 48 V: 1.4 - 125 V: 0.55 - 250 V: 0.27 - 400 V: 0.15
Durability	Number of operating cycles		Mechanical: 5000000 Electrical: cat. AC-15: 1000000
Cabling	Cable (c.s.a. min/max)	<b>mm<sup>2</sup></b>	Min: 1 x 0.22 - max: 2 x 2.5

### GS1AF "blown fuse" signalling contact characteristics

Conventional thermal current (I <sub>th</sub> ) for ambient temperature ≤ 40 °C		<b>A</b>	16
Rated operational current (I <sub>e</sub> )	Cat. AC-15	<b>A</b>	230 V: 4 - 400 V: 3
	Cat. DC-13	<b>A</b>	24 V: 12 - 48 V: 2 - 110 V: 0.6 - 220 V: 0.4
Durability	Number of operating cycles		Mechanical: 30000 Electrical: cat. AC-15: 30000
Cabling		<b>mm</b>	Faston connectors: 1 x 6.35

Ref.



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# TeSys

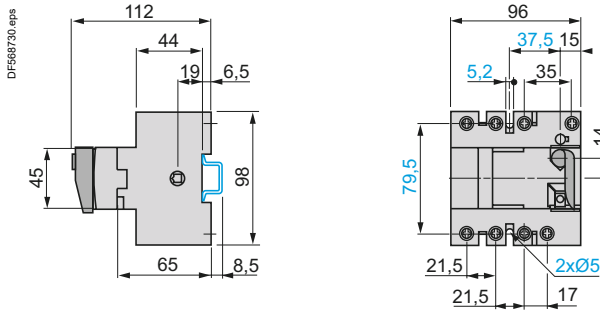
## TeSys GS Switch-disconnector-fuses

### Dimensions

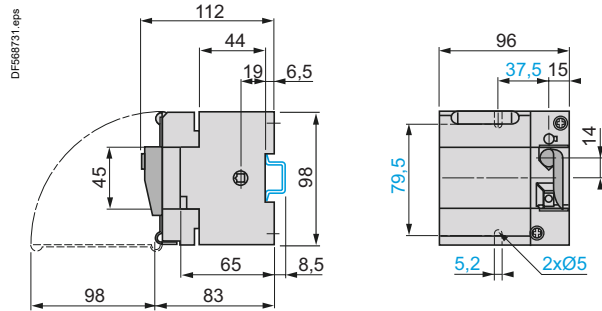
#### IEC - GS1●● (32 A) Switch-disconnector-fuse

##### Direct front-mounted operator

###### GS1DD

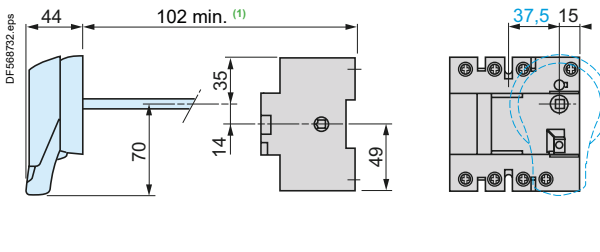


###### GS1DDB

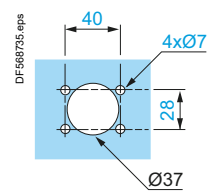


##### External front-mounted operator

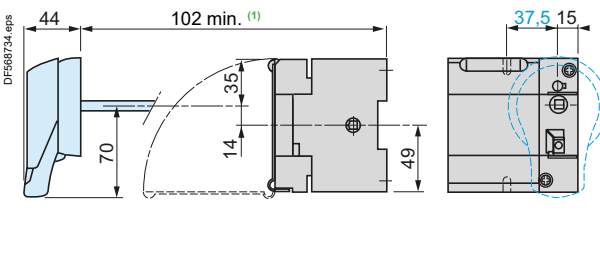
###### GS1DD



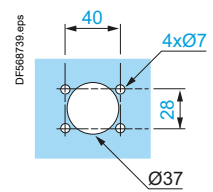
###### Door cut-out



###### GS1DDB



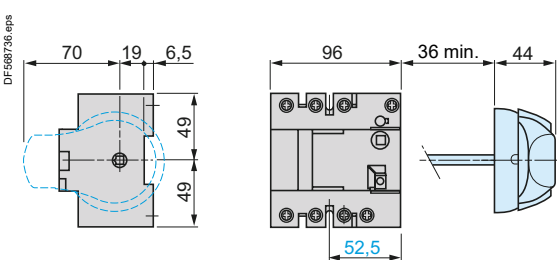
###### Door cut-out



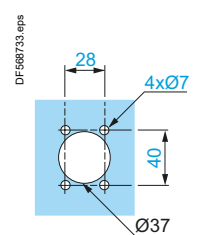
- (1) With 1 or 2 auxiliary contacts GS1AM1●●: 130 mm.  
(2) With 3 or 4 auxiliary contacts GS1AM1●●: 155 mm.

##### External right-hand side-mounted operator

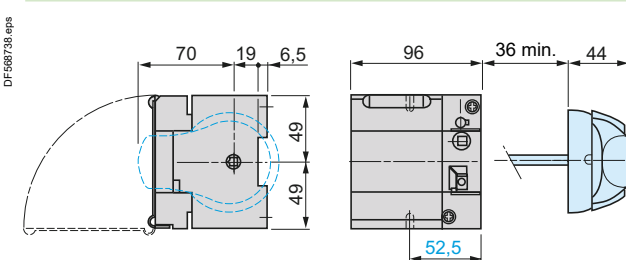
###### GS1DD



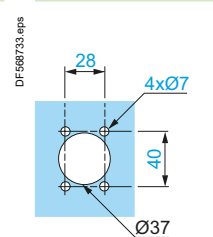
###### Door cut-out



###### GS1DDB



###### Door cut-out





# TeSys

## TeSys GS Switch-disconnector-fuses

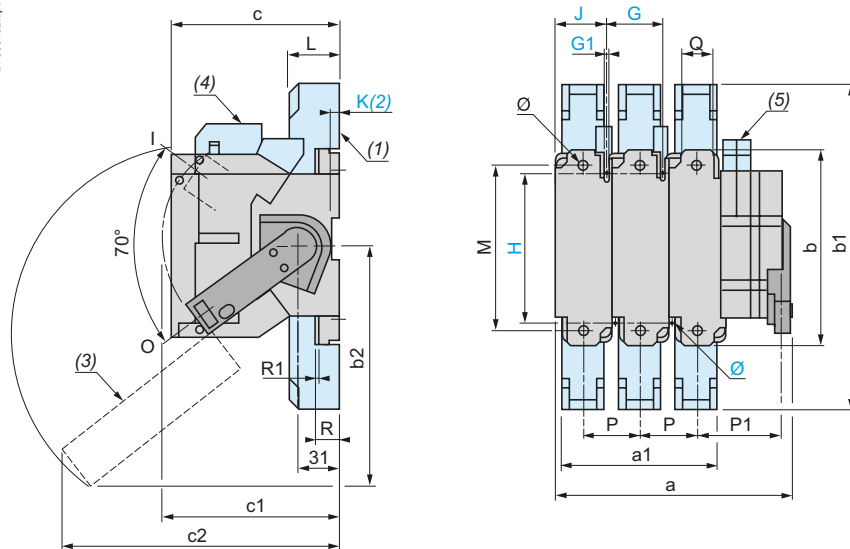
### Dimensions

#### IEC - GS1●● (50...400 A) Switch-disconnector-fuse

Direct right-hand side-mounted operator

GS1FD (50 A), GD (63 A), JD (100 A), KD, KKD (125 A), LD, LLD (160 A), ND (250 A) and QGD (400 A)

DF538732.eps



Ref.



Switch-disconnector-fuses

GS1		a	a1	b	b1	b2	c	c1	c2	G	G1	H	J	K	Ø	L	M	P	P1	Q	R	R1	Ø
FD	3P	118	—	118	—	—	87	134	—	27	5.4	106	31	6.5	5	—	—	27	33.5	—	—	—	—
	4P	145	—	118	—	—	87	134	—	27	5.4	106	31	6.5	5	—	—	27	33.5	—	—	—	—
GD	3P	133	—	118	—	159	116.5	134	145	32	5.4	106	36	6.5	5	—	—	32	36	—	—	—	—
	4P	165	—	118	—	159	116.5	134	145	32	5.4	106	36	6.5	5	—	—	32	36	—	—	—	—
JD, KD	3P	150	108	162	268	—	116	173	—	36	5.4	127	40	—	5	44	141	36	38	20	19.5	2.5	8.5
	4P	186	144	162	268	—	116	173	—	36	5.4	127	40	—	5	44	141	36	38	20	19.5	2.5	8.5
KKD, LLD	3P	150	108	162	268	141	126.5	173	193	36	5.4	127	40	—	5	44	141	36	38	20	19.5	2.5	8.5
	4P	186	144	162	268	141	126.5	173	193	36	5.4	127	40	—	5	44	141	36	38	20	19.5	2.5	8.5
LD	3P	192	136	162	268	174	136.5	173	229	50	5.4	140	54	—	5	44	141	50	45	20	19.5	2.5	8.5
	4P	242	172	162	268	174	136.5	173	229	50	5.4	140	54	—	5	44	141	50	45	20	19.5	2.5	8.5
ND	3P	253	180	195	345	185	146	173	251	60	6.4	162	64	—	6	65	166	60	81	32	19.5	2.5	11
	4P	313	240	195	345	185	146	173	251	60	6.4	162	64	—	6	65	166	60	81	32	19.5	2.5	11
QGD	3P	271	192	205	355	200	149	173	260	66	6.4	172	70	—	6	65	175	66	86	50	20	3	11
	4P	337	258	205	355	200	149	173	260	66	6.4	172	70	—	6	65	175	66	86	50	20	3	11

(1) Terminal cover.

(2) Mounting on rail only for GS1FD and GS1GD (50 and 63 A).

(3) Protective screen, lockable in I position.

(4) 1 or 2 auxiliary contacts GS1AF●●.

(5) 1 or 2 auxiliary contacts GS1AM●.



# TeSys

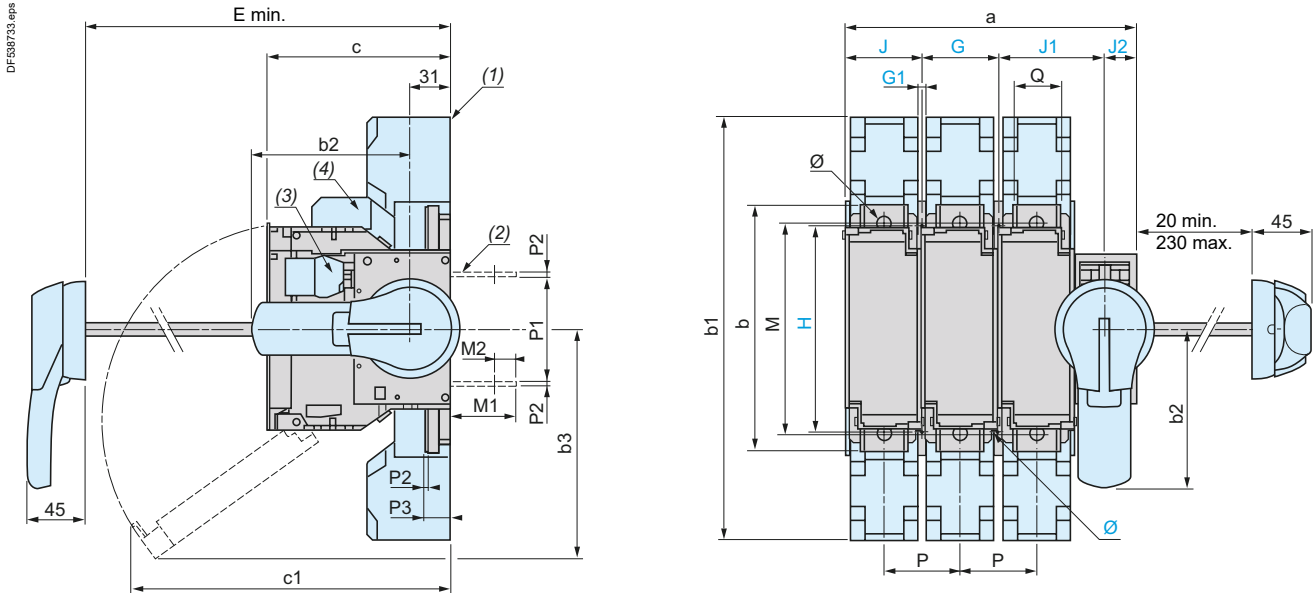
## TeSys GS Switch-disconnector-fuses

### Dimensions

#### IEC - GS2●● (32...400 A) Switch-disconnector-fuse

External front and right-hand side-mounted operator

GS2DB (32 A), F (50 A), G, GB, JB (63 A), J (100 A), K, KK (125 A), L, LL, LB, LLB (160 A), MMB (200 A), N, NB (250 A), PPB (315 A), QQ and QQB (400 A)



GS2		a	b	b1	b2	b3	c	c1	E min.	G	G1	H	J	J1	J2	Ø	M	M1	M2	P	P1	P2	P3	Q	Ø
F, DB	3P	121	118	—	70	85	87 <sup>(5)</sup>	153	100 <sup>(5)</sup>	27	5.4	106	31	45	18	5	—	15	6	27	59	2	—	12	—
	4P	148	118	—	70	85	87 <sup>(5)</sup>	153	100 <sup>(5)</sup>	27	5.4	106	31	45	18	5	—	15	6	27	59	2	—	12	—
G, GB	3P	136	118	—	70	159	116.5 <sup>(6)</sup>	145	125	32	5.4	106	36	50	18	5	—	15	6	32	59	2	—	12	—
	4P	168	118	—	70	159	116.5 <sup>(6)</sup>	145	125	32	5.4	106	36	50	18	5	—	15	6	32	59	2	—	12	—
J, JB, K	3P	148	162	268	125	141	116 <sup>(6)</sup>	187	135	36	5.4	127	40	54	18	5	141	41	8	36	62	2.5	19.5	20	8.5
	4P	184	162	268	125	141	116 <sup>(6)</sup>	187	135	36	5.4	127	40	54	18	5	141	41	8	36	62	2.5	19.5	20	8.5
KK, LL	3P	148	162	268	125	141	126.5 <sup>(6)</sup>	193	135	36	5.4	127	40	54	18	5	141	41	8	36	62	2.5	19.5	20	8.5
	4P	184	162	268	125	141	126.5 <sup>(6)</sup>	193	135	36	5.4	127	40	54	18	5	141	41	8	36	62	2.5	19.5	20	8.5
L, LB, LLB	3P	190	162	268	125	174	136.5	229	145	50	5.4	140	54	64	18	5	141	41	8	50	62	2.5	19.5	20	8.5
	4P	240	162	268	125	174	136.5	229	145	50	5.4	140	54	64	18	5	141	41	8	50	62	2.5	19.5	20	8.5
MMB, NB, N	3P	234	195	345	125	185	146	251	154	60	6.4	162	64	86	25	6	166	52	17	60	84	2.5	19.5	32	11
	4P	294	195	345	125	185	146	251	154	60	6.4	162	64	86	25	6	166	52	17	60	84	2.5	19.5	32	11
PPB, QQB, QQ	3P	252	205	355	125	200	149	260	157	66	6.4	172	70	91	25	6	175	54	14.5	66	84	3	20	50	11
	4P	318	205	355	125	200	149	260	157	66	6.4	172	70	91	25	6	175	54	14.5	66	84	3	20	50	11

(1) Terminal cover.

(2) Rear access connector plates (option).

(3) 1 to 8 auxiliary contacts GS1AM1●●.

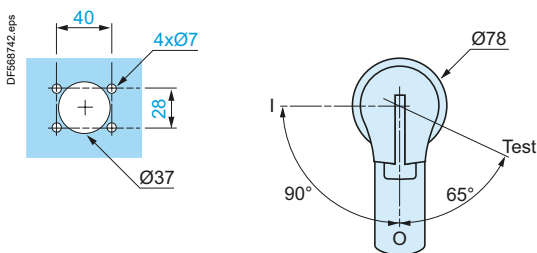
(4) 1 or 2 auxiliary contacts GS1AF●●.

(5) 1 auxiliary contact GS1AM1●●: + 23.5 mm, 2 auxiliary contacts GS1AM1●●: + 47 mm.

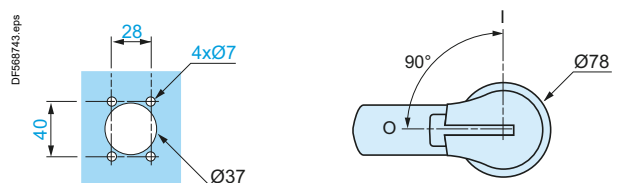
(6) 132 mm with 2 auxiliary contacts GS1AM1●●.

#### Door cut-out

##### For external front-mounted operator



##### For external right-hand side-mounted operator





# TeSys

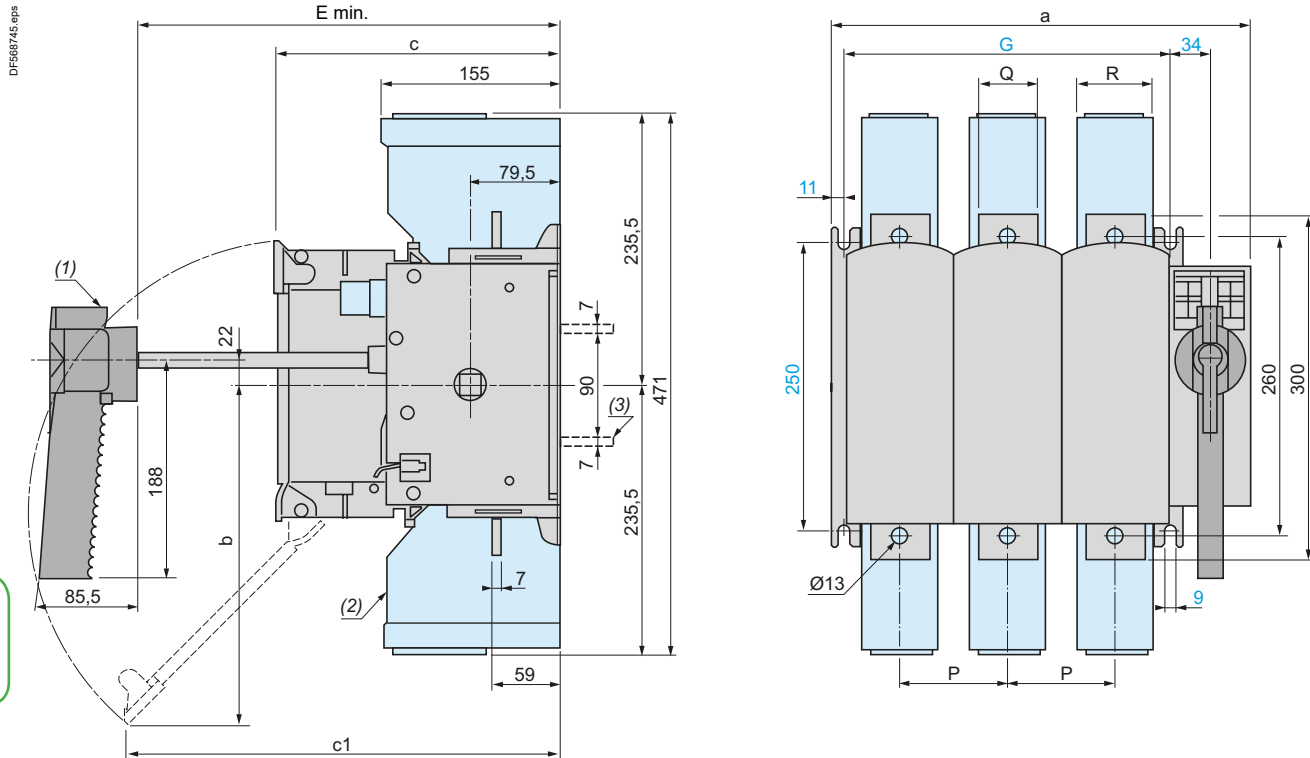
## TeSys GS Switch-disconnector-fuses

### Dimensions

#### IEC - GS2●● (630...1250 A) Switch-disconnector-fuse

Direct front-mounted operator

GS2S, SB (630 A), TB (800 A), V and VB (1250 A)



GS2		a	b	c	c1	E min.	G	P	Q	R
S, SB, TB	3P	364	300	250	380	265	284	94	51	65
	4P	458	300	250	380	265	378	94	51	65
V, VB	3P	442	355	289	295	304	362	120	77	88
	4P	562	355	289	295	304	482	120	77	88

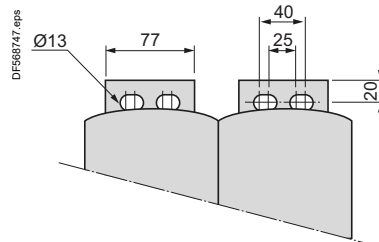
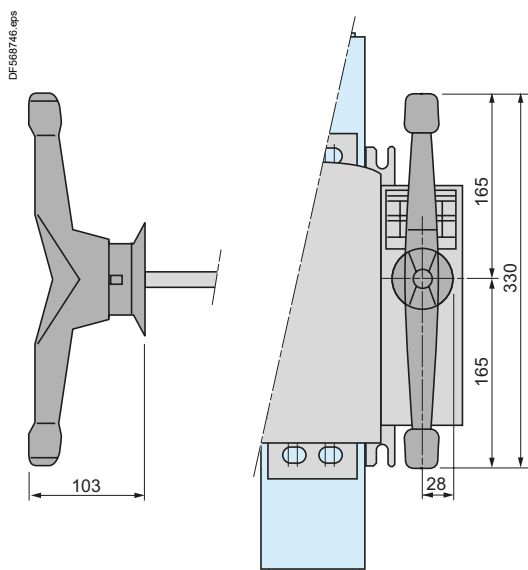
(1) Handle GS2AH104 for GS2S, GS2SB and GS2TB.

(2) Terminal cover.

(3) Rear access connector plates (GS2V and GS2VB).

Handle GS2AH105 for GS2V and GS2VB  
(direct front-mounted operator)

Connector plates for GS2V and GS2VB





# TeSys

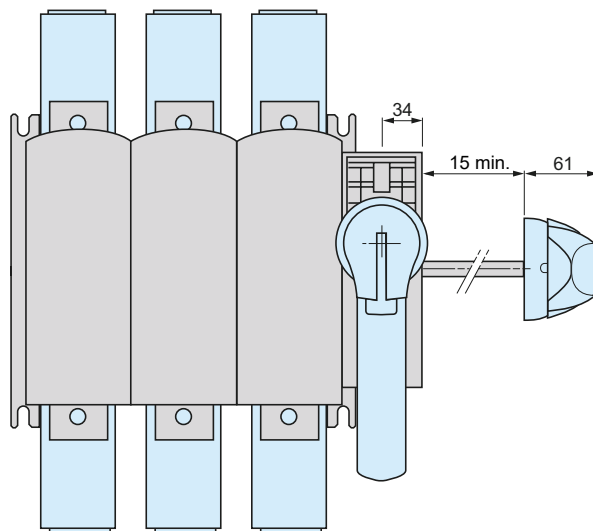
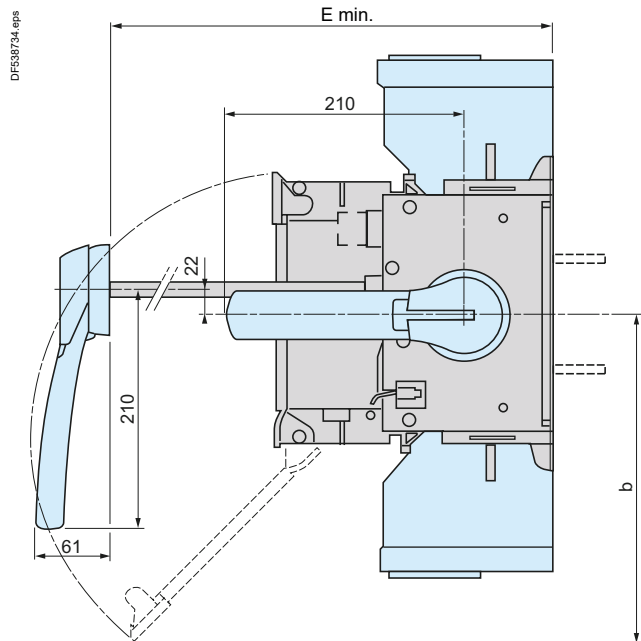
## TeSys GS Switch-disconnector-fuses

### Dimensions

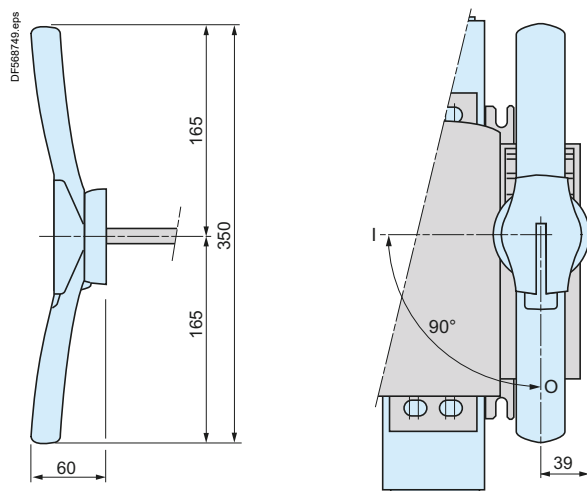
#### IEC - GS2●● (630...1250 A) Switch-disconnector-fuse

External front and right-hand side-mounted operator

GS2S, SB (630 A), TB (800 A), V and VB (1250 A)



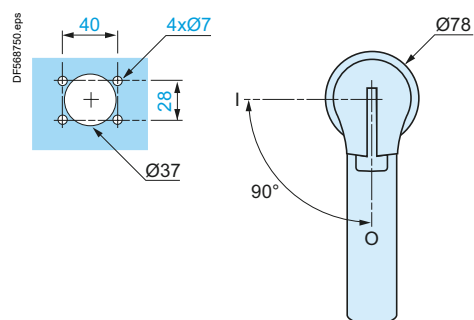
Handle GS2AH570 or GS2AH580 for GS2V and GS2VB (external front-mounted operator)



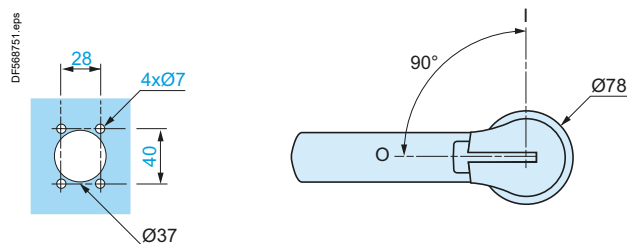
GS2		b	E min.
S, SB, TB	3P	297	265
	4P	297	265
V, VB	3P	350	304
	4P	350	304

#### Door cut-out

For external front-mounted operator



For external right-hand side-mounted operator



References:  
page B5/5

Characteristics:  
pages B5/17 to B5/19

Schemes:  
page B5/31



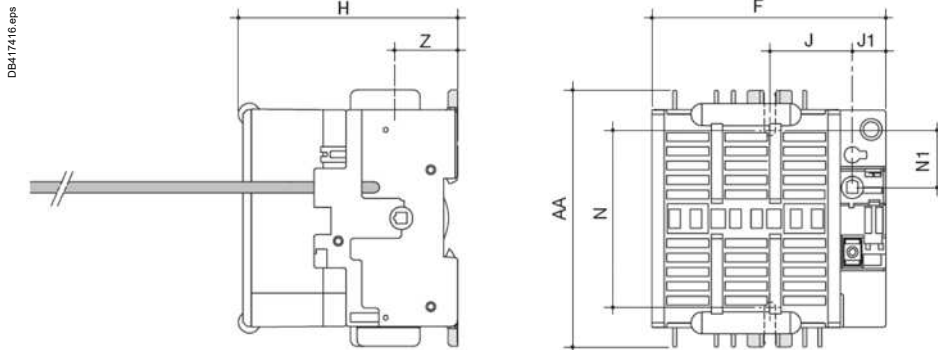
# TeSys

## TeSys GS Switch-disconnector-fuses

### Dimensions

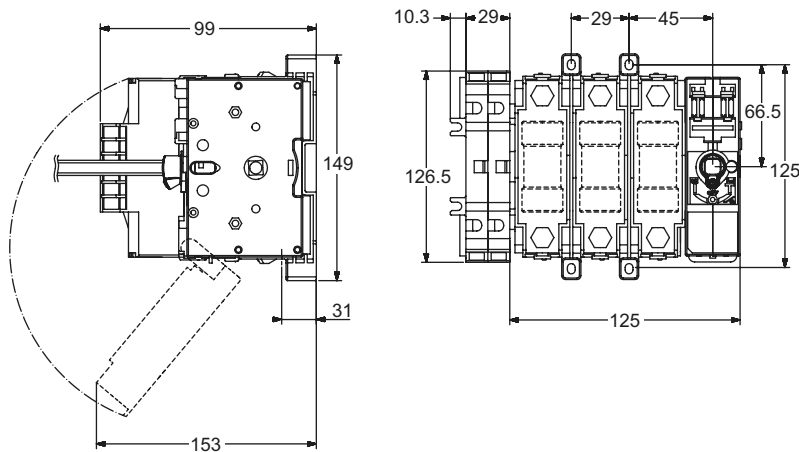
#### UL, CSA, IEC - GS1●● GS2●● Switch-disconnector-fuses (30 and 60 A)

GS1DU3 (30 A) class CC fuses, GS1DDU3 (30 A) class J fuses

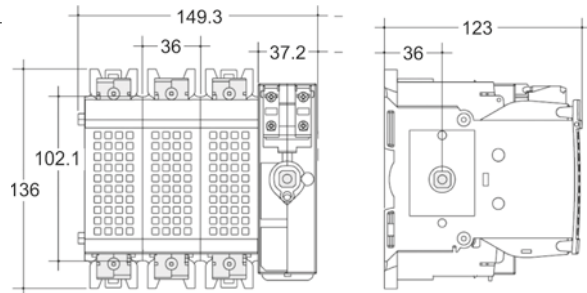


Rating	F	H	J	J1	N	N1	AA	Z
30 / CC	96	83.5	37.5	15	79.5	25.5	116	28.5
30 / J	105	99	37.5	15	79.5	25.5	116	28.5

#### GS2EEU3 (30 A) class CC fuses



#### GS2EU3N, GS2GU3N (60 A) class J fuses



### Accessories

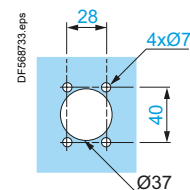
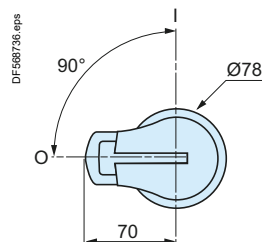
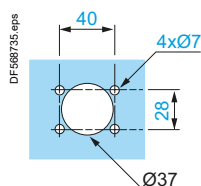
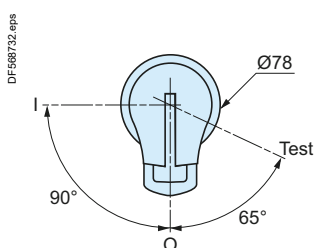
#### Handle for 30 and 60 A switch-disconnector-fuses

##### External front handle

##### Door cut-out

##### External side handle

##### Door cut-out



References:  
pages B5/8 and B5/9

Characteristics:  
pages B5/20 and B5/21

Schemes:  
page B5/31



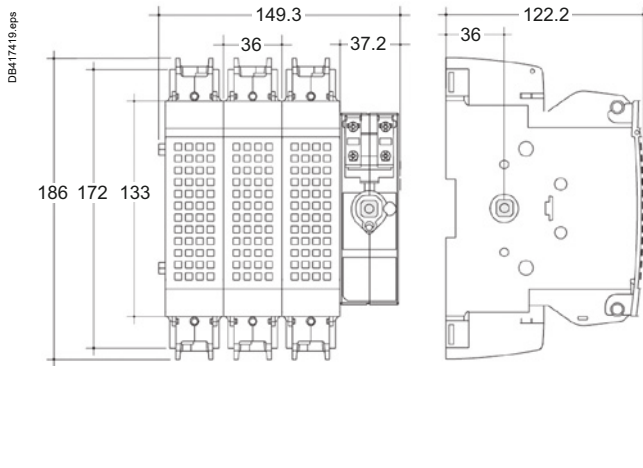
# TeSys

## TeSys GS Switch-disconnector-fuses

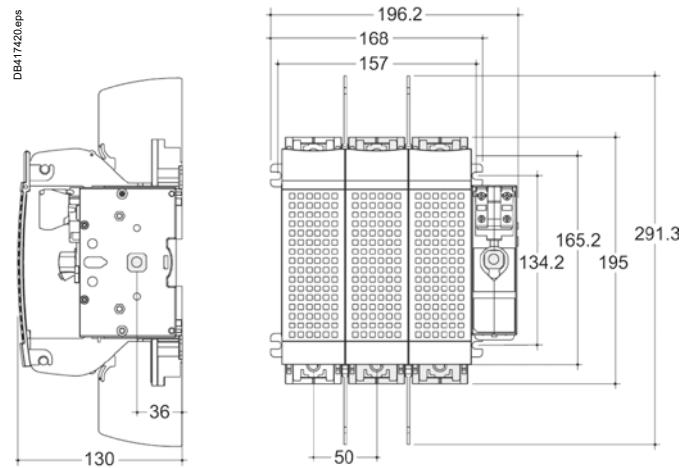
### Dimensions

#### UL, CSA, IEC - GS2●● Switch-disconnector-fuses (100 and 400 A)

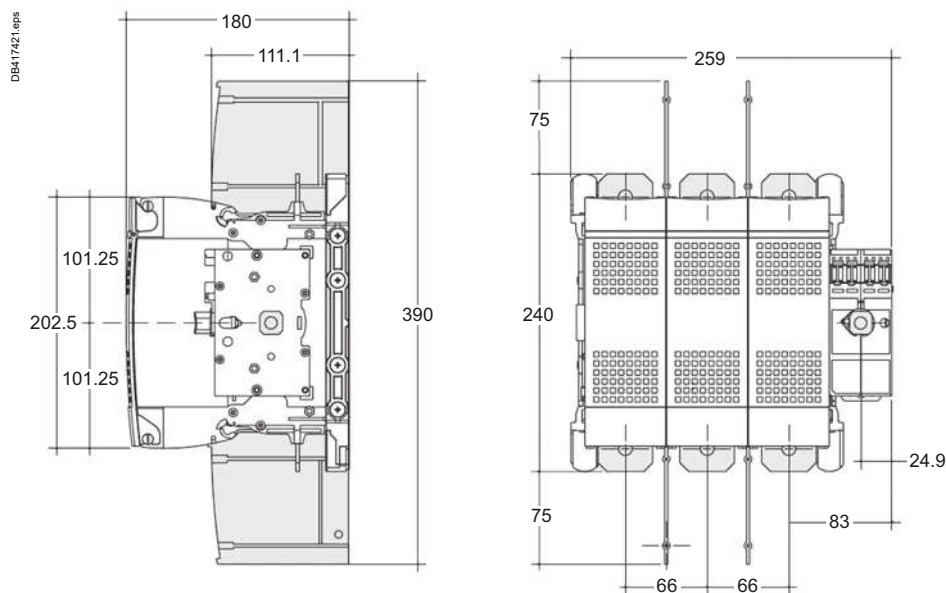
##### GS2JU3N (100 A) class J fuses



##### GS2MU3N (200 A) class J fuses



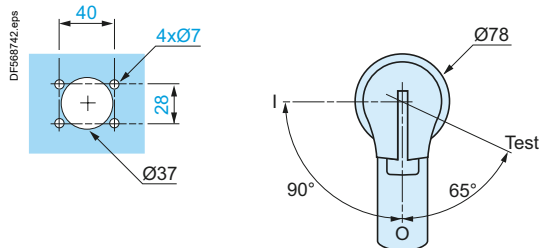
##### GS2QU3N (400 A) class CC fuses



#### Accessories

##### Handle for 100, 200 and 400 A switch-disconnector-fuses

##### For external front-mounted operator



##### For external right-hand side-mounted operator





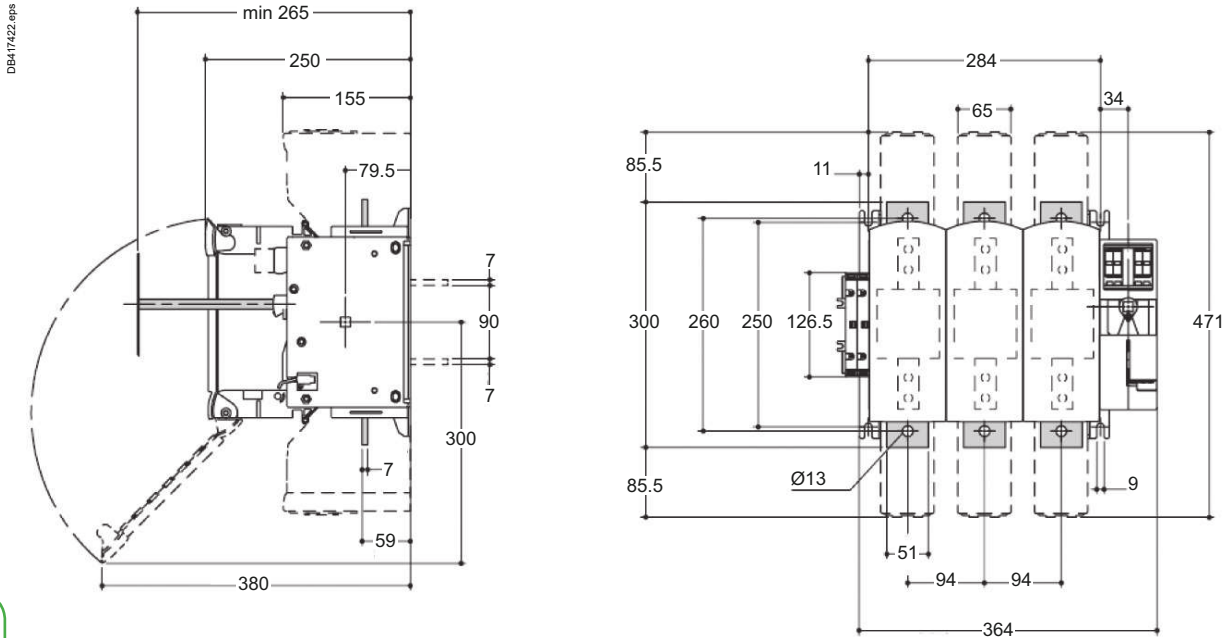
# TeSys

## TeSys GS Switch-disconnector-fuses

### Dimensions

#### UL, CSA, IEC - GS2●● Switch-disconnector-fuses (600 and 800 A)

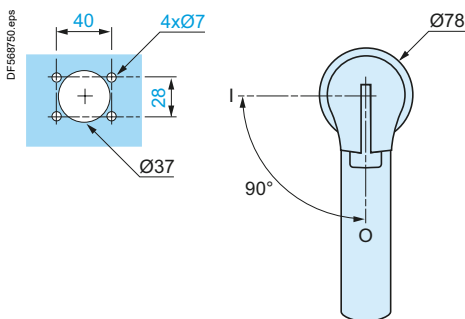
#### GS2SU3 (600 A), GS2TU3 (800 A) class J fuses



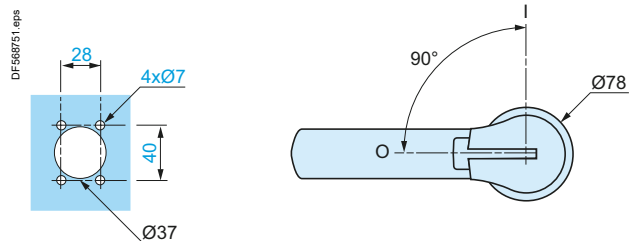
#### Accessories

##### Handle for 600 and 800 A switch-disconnector-fuses

##### For external front-mounted operator



##### For external right-hand side-mounted operator





# TeSys

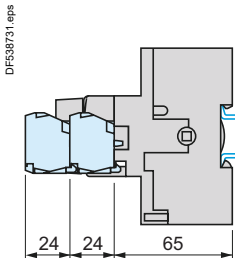
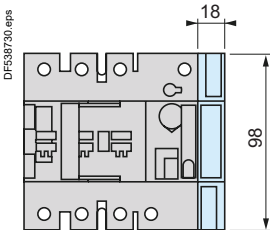
## TeSys GS Switch-disconnector-fuses

### Dimensions, schemes

#### Auxiliary contacts

GS1AM111, GS1AM211

GS1AM110, GS1AM101



#### Schemes

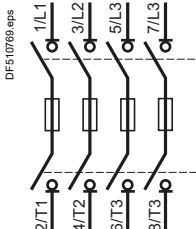
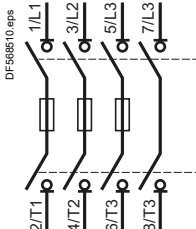
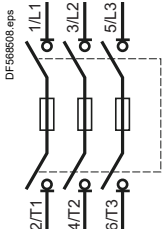
3-pole GS

32 to 1250 A

4-pole GS

32 A

50 to 1250 A



#### Auxiliary contacts

GS1AM110

1 N/O

GS1AM101

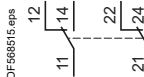
1 N/C

GS1AM111 and GS1AM1

1 C/O

GS1AM211 and GS1AM2

2 C/O



GS1AN●●

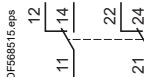
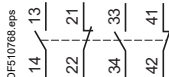
1 N/C + 1 N/O

2 N/C + 2 N/O

GS1AF●

1 C/O

2 C/O





Switch-  
disconnectors  
fuses



TeSys GV2, GV3, GV4, GV5 and GV6 Motor circuit breakers			
Type of product	Range (400/415 V AC)		Pages
Introduction TeSys GV			B6/3
Magnetic and thermal magnetic circuit breakers TeSys GV2L, GV2LE, GV2P, GV2ME	0.06 or 15 kW		B6/11
Thermal magnetic circuit breakers - delayed tripping - For high current peak motors or 3-phase transformers TeSys GV2RT	0.09 or 11 kW		B6/18
Add-on blocks, accessories for GV2			
Magnetic and Thermal magnetic circuit breakers TeSys GV3L, GV3P	5.5 to 45 kW		B6/25
Add-on blocks, accessories			
Magnetic and Thermal magnetic circuit breakers TeSys GV4L, GV4LE, GV4P, GV4PE, GV4PEM, GV4PB	0.25 to 55 kW 1/2 to 60 HP		B6/31
Add-on blocks, accessories			
Thermal magnetic circuit breakers TeSys GV5P, GV6P	55 to 250 kW		B6/49
Add-on blocks, accessories			
TeSys GB Circuit breakers for auxiliary circuits			
Thermal magnetic circuit breakers TeSys GB	0.5 to 20 A		B6/57



Circuit  
breakers

B6/2

Life | s On

**Schneider**  
Electric



# TeSys

## TeSys GV Circuit breakers

### Introduction

#### Circuit breakers for motor protection and control

TeSys GV motor circuit breakers provide compact, reliable and efficient solutions for:

- isolation,
- protection against short circuits and overloads,
- On-Off manual control of motors from 0.06 to 250 kW.

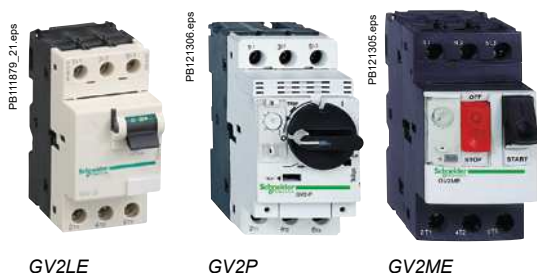
They are conforming to, depending of the versions, IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1 and UL 60497-4-1, CSA 22.2 n° 60497-4-1.

#### TeSys GV protection technologies

TeSys GV are carried with 3 variants:

- Magnetic detection: GV2LE, GV2L, GV3L, GV4L, GV4LE for protection against short-circuit.
- Thermal-magnetic: GV2ME <sup>(1)</sup>, GV2P, GV3P, GV4P, GV4PE, GV5, GV6 for protection against short-circuits, overload, phase loss and phase unbalance.
- Advanced: GV4PEM combines GV4P protections and motor jam, long start, ground-fault protections.

With a magnetic circuit breaker, a thermal relay is frequently associated in order to have a short circuit protection and an overload protection.



GV2LE

GV2P

GV2ME



GV3L

GV3P80



GV4E...

GV4...



GV5P150F

GV6P500F

#### GV2: 45 mm width, for motors up to 15 kW

The most commonly used circuit breaker. with a choice of about 100 auxiliaries and accessories. GV2 and TeSys D or K contactors can be easily assembled as a single block with one accessory.

The high GV2 electrical endurance (up to 100 000 operating cycles) makes it very suitable for direct manual motor control, especially GV2ME <sup>(1)</sup> (thermal-magnetic c.b., Ith up to 32 A).

Enclosure mounting is well adapted to GV2L and GV2P, with their possible extended rotary handle and visible trip indication.

#### GV3: 55 mm width, for motors up to 45 kW

High performance breakers, high breaking capacity (Ics 100 kA/400 V for ratings up to 32 A, 50 kA up to 80 A).

Wide choice of auxiliaries / accessories, possible extended rotary handle. Visible tri indication.

Patented Everlink connectors provide everlasting connection (no re-tightening required).

Direct monoblock starter assembly with TeSys D contactors. No accessory required.

#### GV4: 81 mm width, for motors up to 55 kW

State-of-the-art technology, GV4 is compact and robust. Electronic core of GV4P gives a great detection accuracy, with alarming and advanced protections for GV4PEM, GV4PB.

Magnetic, electronic thermal-magnetic, or electronic thermal magnetic with advanced protections versions.

Ratings up to 115 A with breaking capacity Ics of 25 kA/400 V (B series), 50 kA/400 V (N series) or 100 kA/400 V (S series).

#### GV5: 105 mm width, for motors up to 110 kW / GV6: 140 mm width, for motors up to 250 kW

GV5 and GV6 with advanced thermal-magnetic trip unit provide more effective protection to high power motors in the most demanding appliances.

They provide protection to motors against overloads with selection of a trip class (5, 10 or 20), short-circuits, phase unbalance or phase loss.

Adjustable over-load and short circuit current settings provide flexibility.

Wide choice of auxiliaries/accessories are available for indication, control and operation.

<sup>(1)</sup> GV2ME...AP are specific GV2ME references for CEE zone.



#### GV range overview

Molded case circuit breakers for motor protection and control

##### GV2

	Protection against			Range (kW / 415 V AC)	Control	Terminals	Dimensions (W x H x D)
	Short-circuits	Overload	Jam, ground-fault, long start... (Multifunction - see page B6/6)				
GV2L	●			0.09 to 15	Rotary handle	Screw clamp	44.5 x 89 x 97 (with rotary handle)
GV2LE	●			0.06 to 15	Toggle	Screw clamp	44.5 x 89 x 78.5 (with toggle)
GV2P	●	●		0.06 to 15	Rotary handle	Screw clamp	44.5 x 89 x 97 (with rotary handle)
GV2ME <sup>(1)</sup>	●	●		0.06 to 11	Push button	Screw clamp, lug or spring	44.5 x 89 x 78.2 (with push button) <sup>(2)</sup>
GV2RT	●	●		0.09 to 11	Toggle	Screw clamp	44.5 x 89 x 78.5 (with toggle)

##### GV3

GV3L	●			11 to 45	Rotary handle	Lug, EverLink (BTR screw)	55 x 132 x 136 (with rotary handle)
GV3P	●	●		5.5 to 45			

##### GV4

GV4L	●			0.25 to 55 kW	Rotary handle	Lug, EverLink (BTR screw)	81 x 156 x 116 (with toggle)
GV4LE	●				Toggle		81 X 156 x 165 (with rotary handle)
GV4P	●	●			Rotary handle		
GV4PE	●	●			Toggle		
GV4PEM	●	●	●		Toggle		
GV4PB	●	●	●	½ to 60 HP	Toggle		

##### GV5

GV5P150●	●	●		55 to 110	Direct rotary handle	Lug, screw clamp	105 x 161 x 155 <sup>(3)</sup> (with direct rotary handle)
GV5P220●	●	●					

##### GV6

GV6P320●	●	●		132 to 250	Direct rotary handle	Lug, screw clamp	140 x 255 x 179 <sup>(3)</sup> (with direct rotary handle)
GV6P500●	●	●					

<sup>(1)</sup> GV2ME●●AP are specific GV2ME references for CEE zone.

<sup>(2)</sup> 44.5 x 101 x 78.2 mm for GV2ME●●3.

<sup>(3)</sup> Depth without keylock.



GV2L



GV2LE



GV2P



GV2ME



GV2RT



GV3L



GV3P



GV4L



GV4P



GV4PEM

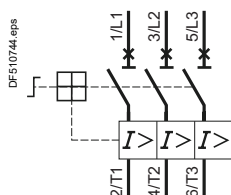


GV5P150F

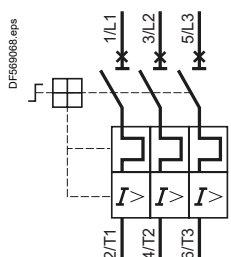


GV6P500F

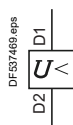




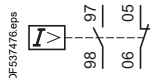
Thermal protection circuit breaker (with rotary control)



Thermal magnetic protection circuit breaker (with rotary control)



Voltage trip



Fault signalling



## Basic functions

### Short circuit protection (magnetic/thermal magnetic circuit breakers)

It provides a protection of the installation against short-circuit by an instantaneous trip of the circuit breaker. The tripping is obtained by means of a magnetic element incorporated in the motor circuit breaker or by an electronic detection (GV4P, GV5 and GV6).

The magnetic tripping threshold is not adjustable, except on GV4L, and is a fixed ratio of the maximum setting current  $I_n$ .

### Overload protection (thermal magnetic circuit breakers)

It provides a protection of the motor against overload. When current drawn by the motor is above its rated current, this continuous overcurrent lead to increase of motor internal temperature and reduce motor life time. Use of suitable protective device shall avoid this damage to the motor. This is obtained by means of a thermal element incorporated in the motor circuit breaker, or by sensors for electronic products (GV4P, GV5 and GV6).

An automatic compensation for ambient temperature variations is also provided. The rated operational current of the motor is displayed by turning a graduated knob.

### Motor ON/OFF control

The circuit breaker provides a local manual control of the motor when used on its own (without contactor). The operation is possible by push buttons, toggle, or a single rotary handle.

### Contacts position indication

Because they are suitable for isolation, the circuit breakers, in the open position, provide an adequate isolation distance and indicate the accurate position of the moving contacts by the position of the operators.

## Additional functions

They are provided by additional modules.

### Under voltage protection

Trips the circuit breaker in case of under voltage. The user is therefore protected against sudden starting of the machine when normal voltage is restored. Circuit breaker reset and/or start button "I" has to be pressed to restart the motor.

### Remote off-power

Circuit breaker can be remotely tripped with the addition of a shunt trip.

### Off-power locking

The operators on both open-mounted and enclosed motor circuit breakers can be locked in the off position "O" by up to 3 padlocks.

## Motor circuit breakers versus fuse protection ?

Circuit breakers are a common solution for Powering motor against short circuits and overloads.

As a comparison, a fuse based solution can only provide a partial protection depending on the choice of the fuse type and rating. The thermal magnetic circuit breaker is adjustable and can be fine-tuned to the practical motor load.

The fuse based solution offers a very fast protection.



# TeSys

## TeSys GV Motor circuit breakers

### Introduction



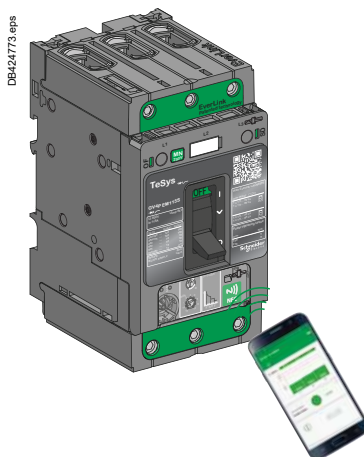
#### Advanced protections embedded on GV4PEM, GV4PB (multifunction)

In addition to basic protections, GV4PEM, GV4PB embed protections against:

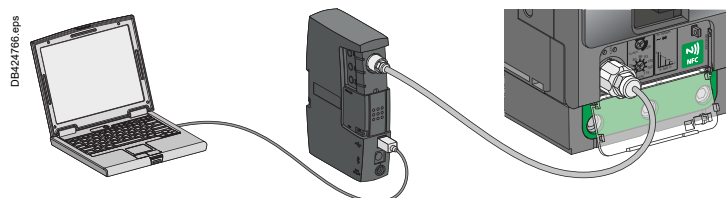
- Long start (high inertia, resistive torque machines)
- Jam (overtorque, machine failure)
- Ground-fault (reduced isolation)
- Unbalanced (phase currents are not equal)
- Phase loss (1 or 2 phases missing).

Fully configurable-advanced protections:

- wireless with 'EcoStruxure Power Device App' application for Android smartphone through NFC (near field communication).

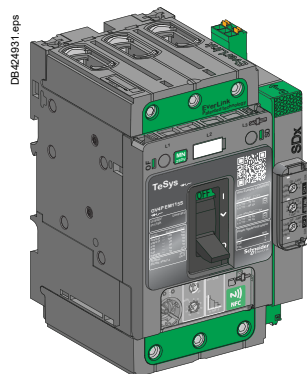


- with EcoStruxure Power Commission software on a computer connected to the test socket through a configuration and maintenance module.



Remote indications:

GV4PEM, GV4PB circuit breaker may be equipped with an SDx alarming / fault differentiation module to prevent to trip or to identify the type of fault after a trip (see page B6/44).





# TeSys

## TeSys GV Motor circuit breakers

### Introduction

#### EverLink technology for TeSys GV3 and GV4

TeSys GV3 and GV4 features a cable connection method with patented creep-compensating technology built directly into the terminal — EverLink:

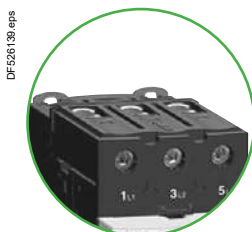
- With EverLink connectors, save space and time during panel assembly.
- Bare cable connections are as safe as compression lug ones.

#### No overheating connections - EverLink creep-compensated terminals for GV3 and GV4

The EverLink patented technology for terminals dramatically reduces the risk of loose bare cables due to copper creeping. Vibration withstand is improved and periodic re-tightening is no longer needed.

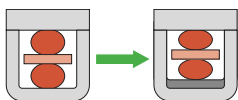


The clamp connectors which don't need re-tightening.



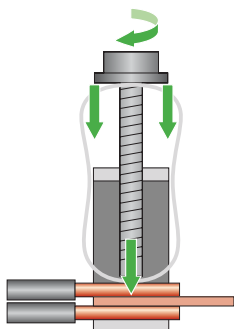
EverLink terminals, with BTR screws

#### Creeping phenomena

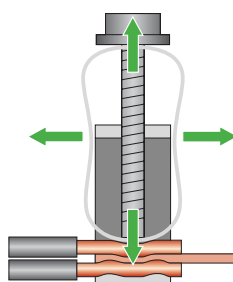


Copper conductors are subject to creep with the time, reducing the contact pressure in conventional clamps

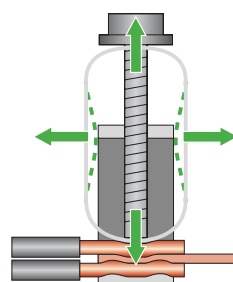
During the tightening a force is applied on the conductors and on a spring.



Maintaining of cables assured by pressure of spring and crimping of conductor on the contact plate.



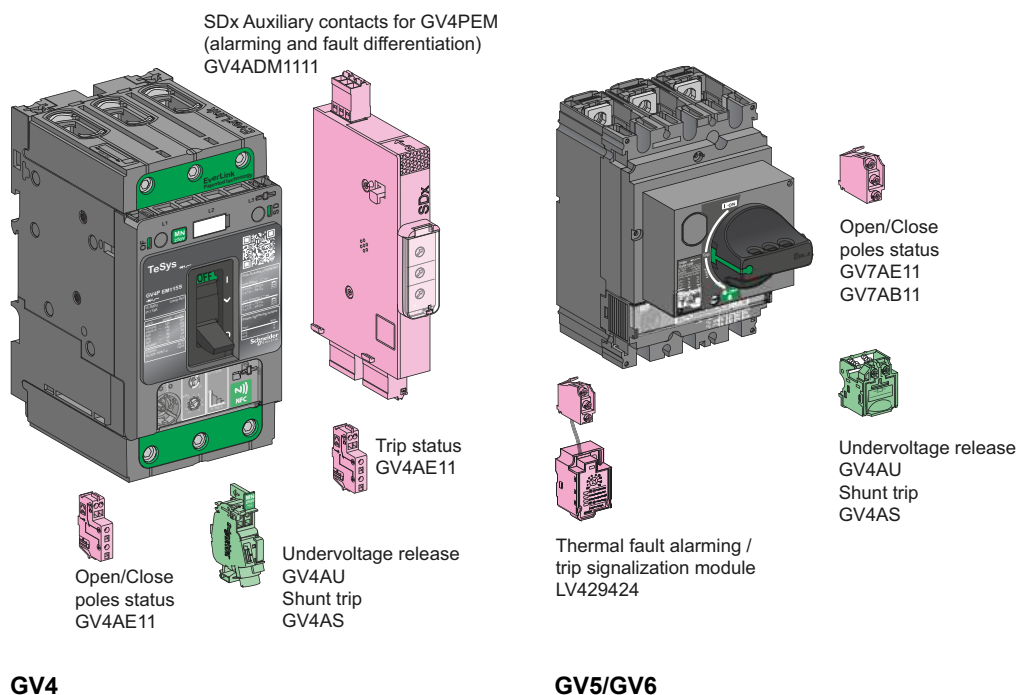
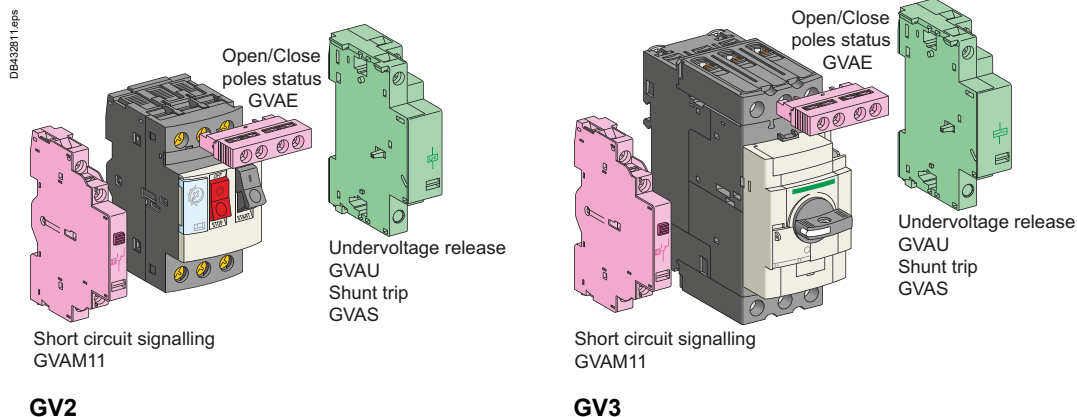
The spring compensates for cable conductor creep. Tightening force is assured.



Circuit breakers



### Auxiliary functions provided by add-on blocks



- Auxiliary contacts add-on blocks**  
 For control, alarms, automatic actions:
- **Instantaneous** indication of the position of the circuit breaker contacts
  - **Trip indication,**
  - **Alarming.**

- Trip units**  
 For remote tripping of circuit breaker:
- **Shunt trip / MX**, trips the circuit breaker when powered
  - **Undervoltage release / MN**, trips the circuit breaker when voltage is loss.

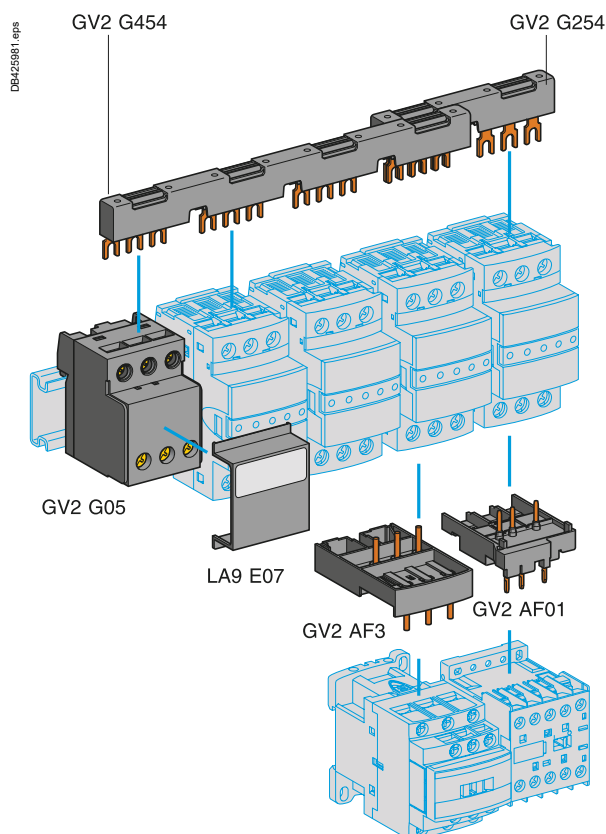


**Compact power circuits wiring with of GV2 + TeSys D contactors <sup>(1)</sup>**

**Busbars and combination blocks**

Power busbars and combinations blocks provide a compact solution for assembling a group of motor starters. They save wiring time and provide a clear finish aspect.

These solutions are available for GV2 circuit breakers + TeSys D contactors.



<sup>(1)</sup> Details on these solution in chapter B2 of TeSys catalogue.



Circuit  
breakers



# TeSys GV2

0.06 to 15 kW



Circuit  
breakers



# TeSys

## TeSys GV2L Magnetic circuit breakers

### Product references



GV2L16



Circuit  
breakers

#### Motor circuit breakers from 0.09 to 15 kW

##### GV2L: Control by rotary knob, connection by screw clamp terminals

Standard power ratings of 3-phase motors

50/60 Hz in category AC-3

Magnetic  
protection  
rating

Tripping  
current  
I<sub>d</sub> ± 20 %

Use in  
association  
with  
thermal  
overload  
relay  
(class 10 A)

Reference

400/415 V			500 V			690 V						
P	I <sub>cu</sub>	I <sub>cs</sub> <sup>(1)</sup>	P	I <sub>cu</sub>	I <sub>cs</sub> <sup>(1)</sup>	P	I <sub>cu</sub>	I <sub>cs</sub> <sup>(1)</sup>				
kW	kA		kW	kA		kW	kA		A	A		
0.09	★	★	—	—	—	—	—	—	0.4	5	LRD03	GV2L03
0.12	★	★	—	—	—	0.37	★	★	0.63	8	LRD04	GV2L04
0.18	★	★	—	—	—	—	—	—	0.63	8	LRD04	GV2L04
—	—	—	—	—	—	0.55	★	★	1	13	LRD05	GV2L05
0.25	★	★	—	—	—	—	—	—	1	13	LRD05	GV2L05
—	—	—	—	—	—	0.75	★	★	1	13	LRD06	GV2L05
0.37	★	★	0.37	★	★	—	—	—	1	13	LRD05	GV2L05
0.55	★	★	0.55	★	★	1.1	★	★	1.6	22.5	LRD06	GV2L06
—	—	—	0.75	★	★	—	—	—	1.6	22.5	LRD06	GV2L06
0.75	★	★	1.1	★	★	1.5	4	100	2.5	33.5	LRD07	GV2L07
1.1	—	—	—	—	—	—	—	—	—	—	LRD08	GV2L08
1.5	★	★	1.5	★	★	3	4	100	4	51	LRD08	GV2L08
—	—	—	—	—	—	—	—	—	—	—	LRD08	GV2L08
2.2	★	★	3	★	★	4	4	100	6.3	78	LRD10	GV2L10
3	★	★	4	10	100	5.5	4	100	10	138	LRD12	GV2L14
4	—	—	—	—	—	—	—	—	—	—	LRD14	GV2L14
—	—	—	—	—	—	7.5	4	100	10	138	LRD14	GV2L14
—	—	—	—	—	—	9	4	100	14	170	LRD16	GV2L16
5.5	50	50	7.5	10	75	11	4	100	14	170	LRD16	GV2L16
7.5	50	50	9	10	75	15	4	100	18	223	LRD21	GV2L20
9	50	50	11	10	75	18.5	4	100	25	327	LRD22	GV2L22
11	50	50	15	10	75	—	—	—	25	327	LRD22	GV2L22
15	50	50	18.5	10	75	22	4	100	32	416	LRD32	GV2L32

(1) As % of I<sub>cu</sub>. Associated current limiter or fuses, where required.

★ > 100 kA.



# TeSys

## TeSys GV2LE Magnetic circuit breakers

### Product references

PS111079 eps



GV2L

Magnetic motor circuit breakers from 0.06 to 15 kW												
GV2LE: control by rocker lever, connection by screw clamp terminals												
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Magnetic protection rating	Tripping current I <sub>d</sub> ± 20 %	Use in association with thermal overload relay	Reference
400/415 V			500 V			690 V						
P	I <sub>cu</sub>	I <sub>cs</sub> <sup>(1)</sup>	P	I <sub>cu</sub>	I <sub>cs</sub> <sup>(1)</sup>	P	I <sub>cu</sub>	I <sub>cs</sub> <sup>(1)</sup>				
kW	kA		kW	kA		kW	kA		A	A		
0.06	★	★	—	—	—	—	—	—	0.4	5	LR2K0302	GV2LE03
0.09	★	★	—	—	—	—	—	—	0.4	5	LR2K0304	GV2LE03
0.12	★	★	—	—	—	0.37	★	★	0.63	8	LR2K0304	GV2LE04
0.18	★	★	—	—	—	—	—	—	0.63	8	LR2K0305	GV2LE04
—	—	—	—	—	—	0.55	★	★	1	13	LR2K0305	GV2LE05
0.25	★	★	—	—	—	—	—	—	1	13	LR2K0306	GV2LE05
—	—	—	—	—	—	0.75	★	★	1	13	LR2K0306	GV2LE05
0.37	★	★	0.37	★	★	—	—	—	1	13	LR2K0306	GV2LE05
0.55	★	★	0.55	★	★	1.1	★	★	1.6	22.5	LR2K0307	GV2LE06
—	—	—	0.75	★	★	—	—	—	1.6	22.5	LR2K0307	GV2LE06
0.75	★	★	1.1	★	★	1.5	3	75	2.5	33.5	LR2K0308	GV2LE07
1.1	★	★	—	—	—	—	—	—	2.5	33.5	LR2K0308	GV2LE07
1.5	★	★	1.5	★	★	3	3	75	4	51	LR2K0310	GV2LE08
—	—	—	2.2	★	★	—	—	—	4	51	LR2K0312	GV2LE08
2.2	★	★	3	50	100	4	3	75	6.3	78	LR2K0312	GV2LE10
3	★	★	4	10	100	5.5	3	75	10	138	LR2K0314	GV2LE14
4	★	★	5.5	10	100	—	—	—	10	138	LR2K0316	GV2LE14
—	—	—	—	—	—	7.5	3	75	10	138	LRD14	GV2LE14
—	—	—	—	—	—	9	3	75	14	170	LRD16	GV2LE16
5.5	15	50	7.5	6	75	11	3	75	14	170	LR2K0321	GV2LE16
7.5	15	50	9	6	75	15	3	75	18	223	LRD21	GV2LE20
9	15	40	11	4	75	18.5	3	75	25	327	LRD22	GV2LE22
11	15	40	15	4	75	—	—	—	25	327	LRD22	GV2LE22
15	10	50	18.5	4	75	22	3	75	32	416	LRD32	GV2LE32

<sup>(1)</sup> As % of I<sub>cu</sub>.

★ > 100 kA.



Circuit  
breakers



# TeSys

## TeSys GV2ME Thermal-magnetic circuit breakers

### Product references



GV2ME



Circuit  
breakers

#### Motor circuit breakers from 0.06 to 15 kW / 400 V, with screw clamp terminals

##### GV2ME with pushbutton control

Standard power ratings of 3-phase motors  
50/60 Hz in category AC-3

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Setting range of thermal trips <sup>(2)</sup>	Magnetic tripping current I <sub>d</sub> ± 20 %	Reference
400/415 V			500 V			690 V					
P	I <sub>cu</sub>	I <sub>cs</sub> <sup>(1)</sup>	P	I <sub>cu</sub>	I <sub>cs</sub> <sup>(1)</sup>	P	I <sub>cu</sub>	I <sub>cs</sub> <sup>(1)</sup>			
kW	kA	%	kW	kA	%	kW	kA	%	A	A	
—	—	—	—	—	—	—	—	—	0.1...0.16	1.5	GV2ME01
0.06	★	★	—	—	—	—	—	—	0.16...0.25	2.4	GV2ME02
0.09	★	★	—	—	—	—	—	—	0.25...0.40	5	GV2ME03
0.12	★	★	—	—	—	0.37	★	★	0.40...0.63	8	GV2ME04
0.18	★	★	—	—	—	—	—	—			
0.25	★	★	—	—	—	0.55	★	★	0.63...1	13	GV2ME05
0.37	★	★	0.37	★	★	—	—	—	1...1.6	22.5	GV2ME06
0.55	★	★	0.55	★	★	0.75	★	★			
—	—	—	0.75	★	★	1.1	★	★			
0.75	★	★	1.1	★	★	1.5	3	75	1.6...2.5	33.5	GV2ME07
1.1	★	★	1.5	★	★	2.2	3	75	2.5...4	51	GV2ME08
1.5	★	★	2.2	★	★	3	3	75			
2.2	★	★	3	50	100	4	3	75	4...6.3	78	GV2ME10
3	★	★	4	10	100	5.5	3	75	6...10	138	GV2ME14
4	★	★	5.5	10	100	7.5	3	75			
5.5	15	50	7.5	6	75	9	3	75	9...14	170	GV2ME16
—	—	—	—	—	—	11	3	75			
7.5	15	50	9	6	75	15	3	75	13...18	223	GV2ME20
9	15	40	11	4	75	18.5	3	75	17...23	327	GV2ME21
11	15	40	15	4	75	—	—	—	20...25	327	GV2ME22 <sup>(3)</sup>
15	10	50	18.5	4	75	22	3	75	24...32	416	GV2ME32

#### Motor circuit breakers from 0.06 to 15 kW / 400 V, with lugs

To order thermal magnetic circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above.

Example: **GV2ME08** becomes **GV2ME086**.

##### Thermal magnetic circuit breakers GV2ME with built-in auxiliary contact block

With instantaneous auxiliary contact block (composition, see page B6/21):

■ GVAE1, add suffix **AE1TQ** to the motor circuit breaker reference selected above.

Example: **GV2ME01AE1TQ**.

■ GVAE11, add suffix **AE11TQ** to the motor circuit breaker reference selected above.

Example: **GV2ME01AE11TQ**.

■ GVAN11, add suffix **AN11TQ** to the motor circuit breaker reference selected above.

Example: **GV2ME01AN11TQ**.

These circuit breakers with built-in contact block are sold in lots of 20 units in a single pack.

(1) As % of I<sub>cu</sub>.

(2) The thermal trip setting must be within the range marked on the graduated knob.

(3) Maximum rating which can be mounted in enclosures **GV2MC** or **MP**, please consult your Regional Sales Office.

★ > 100 kA.





GV2ME

Motor circuit breakers from 3/4 to 20 HP / 460 V, with screw clamp terminals										
GV2ME with pushbutton control										
Thermal setting (A)	Maximum Horsepower ratings								Group Motor applications	Reference
	Single-Phase			Three-Phase						
	115 V	200 V	230 V	115 V	200 V	230 V	460 V	575 V	Max. Fuse or Circuit breaker (A)	
0.1...0.16	—	—	—	—	—	—	—	—	450	GV2ME01
0.16...0.25	—	—	—	—	—	—	—	—	450	GV2ME02
0.25...0.40	—	—	—	—	—	—	—	—	450	GV2ME03
0.40...0.63	—	—	—	—	—	—	—	—	450	GV2ME04
0.63...1	—	—	—	—	—	—	—	1/2	450	GV2ME05
1...1.6	—	—	1/10	—	—	—	3/4	3/4	450	GV2ME06
1.6...2.5	—	1/6	1/6	—	1/2	1/2	1	1.5	450	GV2ME07
2.5...4	1/8	1/4	1/3	—	3/4	3/4	2	3	450	GV2ME08
4...6.3	1/4	1/2	1/2	3/4	1	1.5	3	5	450	GV2ME10
6...10	1/2	1	1.5	1	2	3	5	7.5	450	GV2ME14
9...14	3/4	2	2	2	3	3	10	10	450	GV2ME16
13...18	1	2	3	2	5	5	10	15	450	GV2ME20
17...23	1.5	3	3	3	5	7.5	15	20	450	GV2ME21
20...25	2	—	—	—	7.5	7.5	15	20	450	GV2ME22
24...32	2	5	5	5	7.5	10	20	25	450	GV2ME32





# TeSys

## TeSys GV2ME Thermal-magnetic circuit breakers

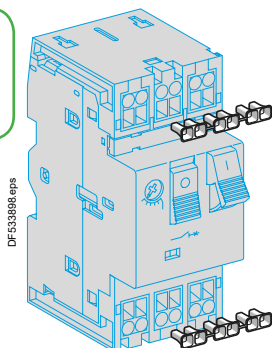
### Product references



GV2ME●●3



Circuit breakers



LA9D99

#### Motor circuit breakers from 0.06 to 11 kW, with spring terminal connections

##### GV2ME <sup>(1)</sup> with pushbutton control

Standard power ratings of 3-phase motors  
50/60 Hz in category AC-3

400/415 V 500 V

P Icu Ics <sup>(2)</sup> P Icu Ics <sup>(2)</sup>

kW kA % kW kA %

— — — — — —

0.06 ★ ★ — — —

0.09 ★ ★ — — —

0.12 ★ ★ — — —

0.18 ★ ★ — — —

0.25 ★ ★ 0.37 ★ ★

0.37 ★ ★ 0.37 ★ ★

0.55 ★ ★ 0.55 ★ ★

0.75 ★ ★ 1.1 ★ ★

1.1 ★ ★ 1.5 ★ ★

1.5 ★ ★ 2.2 ★ ★

2.2 ★ ★ 3 50 100

3 ★ ★ 4 10 100

4 ★ ★ 5.5 10 100

5.5 15 50 7.5 6 75

7.5 15 50 9 6 75

9 15 40 11 4 75

11 15 40 15 4 75

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Setting  
range  
of thermal  
trips  
<sup>(3)</sup>

A

0.1...0.16

0.16...0.25

0.25...0.40

0.40...0.63

0.63...1

1...1.6

1.6...2.5

2.5...4

4...6.3

6...10

9...14

13...18

17...23

20...25

20...25

20...25

20...25

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Magnetic  
tripping  
current  
I<sub>d</sub> ± 20 %

A

1.5

2.4

5

8

13

22.5

33.5

51

78

138

170

223

327

327

327

327

327

327

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Reference

GV2ME013

GV2ME023

GV2ME033

GV2ME043

GV2ME053

GV2ME063

GV2ME073

GV2ME083

GV2ME103

GV2ME143

GV2ME163

GV2ME203

GV2ME213

GV2ME223

#### Contact blocks

Description

Instantaneous  
auxiliary contacts

Mounting

Front

LH side

Maximum  
number

1

2

Type of  
contacts

N/O + N/C

N/O + N/O

N/O + N/C

N/O + N/O

Sold in  
lots of

10

10

1

1

Unit  
reference

GVAE113

GVAE203

GVAN113

GVAN203

#### Accessory

Description

Cable end reducer

Application

For connection of conductors from 1 to 1.5 mm<sup>2</sup>

Sold in  
lots of

20

Unit  
reference

LA9D99

<sup>(1)</sup> For connection of conductors from 1 to 1.5 mm<sup>2</sup>, the use of an LA9D99 cable end reducer is recommended.

<sup>(2)</sup> Maximum rating which can be mounted in enclosures GV2MC or MP, please consult your Regional Sales Office

<sup>(3)</sup> The thermal trip setting must be within the range marked on the graduated knob.

★ > 100 kA.



# TeSys

## TeSys GV2P Thermal-magnetic circuit breakers

### Product references



GV2P

#### Motor circuit breakers from 0.06 to 30 kW / 400 V

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Setting range of thermal trips (2)	Magnetic tripping current I <sub>d</sub> ± 20 %	Reference
400/415 V			500 V			690 V					
P	I <sub>cu</sub>	I <sub>cs</sub> (1)	P	I <sub>cu</sub>	I <sub>cs</sub> (1)	P	I <sub>cu</sub>	I <sub>cs</sub> (1)			
kW	kA	%	kW	kA	%	kW	kA	%	A	A	
GV2P: control by rotary knob											
Screw clamp terminals											
—	—	—	—	—	—	—	—	—	0.1...0.16	1.5	GV2P01
0.06	★	★	—	—	—	—	—	—	0.16...0.25	2.4	GV2P02
0.09	★	★	—	—	—	—	—	—	0.25...0.40	5	GV2P03
0.12	★	★	—	—	—	0.37	★	★	0.40...0.63	8	GV2P04
0.18	★	★	—	—	—	—	—	—			
0.25	★	★	—	—	—	0.55	★	★	0.63...1	13	GV2P05
0.37	★	★	0.37	★	★	—	—	—	1...1.6	22.5	GV2P06
0.55	★	★	0.55	★	★	0.75	★	★			
0.75	★	★	1.1	★	★	1.5	8	100	1.6...2.5	33.5	GV2P07
1.1	★	★	1.5	★	★	2.2	8	100	2.5...4	51	GV2P08
2.2	★	★	3	★	★	4	6	100	4...6.3	78	GV2P10
3	★	★	5	50	100	5.5	6	100	6...10	138	GV2P14
5.5	★	★	7.5	42	75	9	6	100	9...14	170	GV2P16
—	—	—	—	—	—	11	6	100			
7.5	50	50	9	10	75	15	4	100	13...18	223	GV2P20
9	50	50	11	10	75	18.5	4	100	17...23	327	GV2P21
11	50	50	15	10	75	—	—	—	20...25	327	GV2P22
15	50	50	18.5	10	75	22	4	100	24...32	416	GV2P32

How to use the table : select your load operating voltage, then select its standard power value (below, in the same column). The appropriate circuit breaker is in the extreme right column, in the corresponding row.

Example: GV2P04 can protect 0.12 and 0.18 kW under 400/415 V, and 0.18 kW under 440 V, and 0,37 kW under 690 V. No 500 V standard power value can fit GV2P04.

#### Motor circuit breakers up to 50 HP / 600 V, UL 60947-4-1 type E

##### GV2 (3)

To obtain a GV2P motor circuit breaker, UL 60947-4-1 type E, use the following with the circuit breaker:

- a "Large Spacing" adapter **GV2GH7**.

#### Motor circuit breakers from 3/4 to 20 HP / 460 V, with screw clamp terminals

##### GV2P with rotary handle

Thermal setting (A)	Maximum Horsepower ratings <sup>(4)</sup>									Group Motor applications Max. Fuse or Circuit breaker (A)	Reference
	Single-Phase			Three-Phase							
	115 V	200 V	230 V	115 V	200 V	230 V	460 V	575 V			
0.1...0.16	—	—	—	—	—	—	—	—	450	GV2P01	
0.16...0.25	—	—	—	—	—	—	—	—	450	GV2P02	
0.25...0.40	—	—	—	—	—	—	—	—	450	GV2P03	
0.40...0.63	—	—	—	—	—	—	—	—	450	GV2P04	
0.63...1	—	—	—	—	—	—	—	1/2	450	GV2P05	
1...1.6	—	—	1/10	—	—	—	3/4	3/4	450	GV2P06	
1.6...2.5	—	1/6	1/6	—	1/2	1/2	1	1.5	450	GV2P07	
2.5...4	1/8	1/4	1/3	—	3/4	3/4	2	3	450	GV2P08	
4...6.3	1/4	1/2	1/2	3/4	1	1.5	3	5	450	GV2P10	
6...10	1/2	1	1.5	1	2	3	5	7.5	450	GV2P14	
9...14	3/4	2	2	2	3	3	10	10	450	GV2P16	
13...18	1	2	3	2	5	5	10	15	450	GV2P20	
17...23	1.5	3	3	3	5	7.5	15	20	450	GV2P21	
20...25	2	—	—	—	7.5	7.5	15	20	450	GV2P22	
24...32	2	5	5	5	7.5	10	20	25	450	GV2P32	

(1) As % of I<sub>cu</sub>.

(2) The thermal trip setting must be within the range marked on the graduated knob.

(3) Accessory: see page B6/23.

(4) 3P FLA corresponding values: see page A6/58.

★ > 100 kA.



# TeSys

## TeSys GV2RT Thermal-magnetic circuit breakers

### Product references

PG21514.eps



GV2RT



Circuit breakers

#### For motors with high current peak on starting

##### Control by rocker lever

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3					Setting range of thermal trips (1) A	Magnetic tripping current I <sub>d</sub> ± 20 % A	Reference
220/ 230 V	400/ 415 V	440 V	500 V	690 V			
kW	kW	kW	kW	kW			
0.06	0.09	0.09 0.12	–	–	0.25...0.40	8	GV2RT03
–	0.12 0.18	0.18	–	0.37	0.40...0.63	13	GV2RT04
0.09 0.12	0.25 0.37	0.25 0.37	0.37	0.55	0.63...1	22	GV2RT05
0.18 0.25	0.37 0.55	0.37 0.55	0.37 0.55 0.75	0.75 1.1	1...1.6	33	GV2RT06
0.37	0.75	0.75 1.1	1.1	1.5	1.6...2.5	51	GV2RT07
0.55 0.75	1.1 1.5	1.5	1.5 2.2	2.2 3	2.5...4	78	GV2RT08
1.1	2.2	2.2 3	3	4	4...6.3	138	GV2RT10
1.5 2.2	3 4	4	4 5.5	5.5 7.5	6...10	200	GV2RT14
2.2 3	5.5	5.5 7.5	7.5	9 11	9...14	280	GV2RT16
4	7.5	7.5 9	9	15	13...18	400	GV2RT20
5.5	9 11	11	11	18.5	17...23	400	GV2RT21

(1) The thermal trip setting must be within the range marked on the graduated knob.

#### For primaries of 3-phase transformers

##### Control by rocker lever

Standard power ratings					Setting range of thermal trips (2) A	Magnetic tripping current I <sub>d</sub> ± 20 % A	Reference
230/240 V	400/415 V	440 V	500 V	690 V			
kVA	kVA	kVA	kVA	kVA			
–	–	–	–	–	0.25...0.40	8	GV2RT03
–	–	–	–	–	0.40...0.63	13	GV2RT04
–	–	0.63	0.63	1	0.63...1	22	GV2RT05
0.4	0.63	1	1	–	1...1.6	33	GV2RT06
0.63	1	–	1.6	1.6 2	1.6...2.5	51	GV2RT07
1	1.6 2	1.6 2	2 2.5	2.5	2.5...4	78	GV2RT08
1.6 2	2.5	2.5 4	4	4 5 6.3	4...6.3	138	GV2RT10
2.5	4 5	5	5 6.3	–	6...10	200	GV2RT14
4	6.3	6.3	–	10 12.5	9...14	280	GV2RT16
5 6.3	10	10	10 12.5	10	13...18	400	GV2RT20

#### Accessory (3)

##### Description

**Padlockable external operator (IP 54)**  
black handle, blue legend plate

**Reference**  
GV2AP03

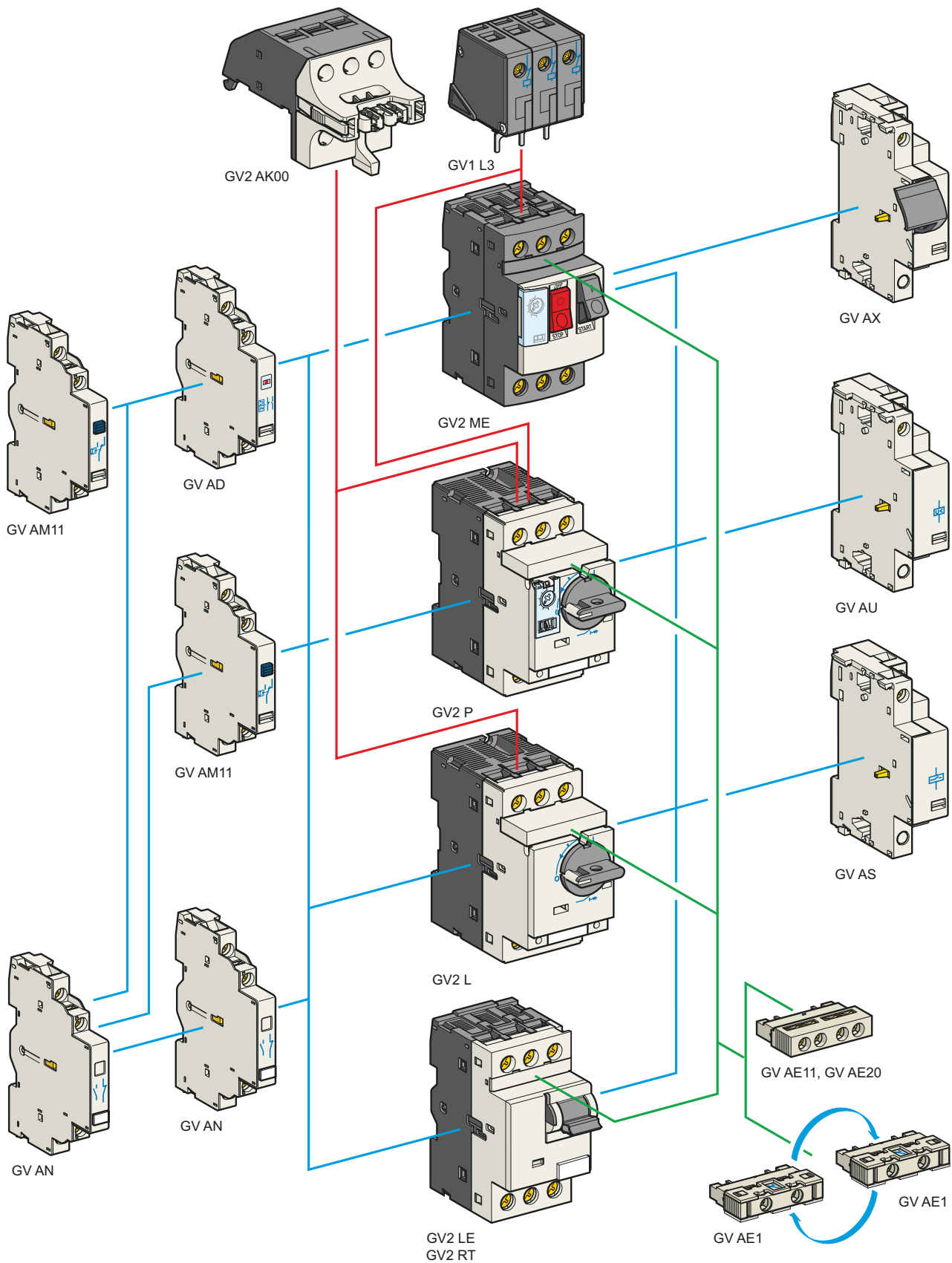
(2) The thermal trip setting must be within the range marked on the graduated knob.

(3) Other accessories such as mounting, cabling and marking accessories are identical to those used for GV2ME motor circuit breakers, see page B6/23.



Circuit  
breakers







### Contact blocks

Description	Mounting	Maximum number	Type of contacts	Sold in lots of	Unit reference	
Instantaneous auxiliary contacts	Front <sup>(1)</sup>	1	N/O or N/C <sup>(2)</sup>	10	GVAE1	
			N/O + N/C	10	GVAE11	
			N/O + N/O	10	GVAE20	
	Side (LH)	2	N/O + N/C	1	GVAN11	
			N/O + N/O	1	GVAN20	
Fault signalling contact + instantaneous auxiliary contact	Side <sup>(3)</sup> (LH)	1	N/O (fault)	+ N/O	1	GVAD1010
				+ N/C	1	GVAD1001
			N/C (fault)	+ N/O	1	GVAD0110
				+ N/C	1	GVAD0101
				Short-circuit signalling contact	Side (LH)	1

### Electric trips

Mounting	Voltage		Reference
Undervoltage or shunt trips <sup>(4)</sup>			
Side (1 block on RH side of circuit breaker)	24 V	50 Hz	GVA●025
		60 Hz	GVA●026
	48 V	50 Hz	GVA●055
		60 Hz	GVA●056
	100 V	50 Hz	GVA●107
	100...110 V	60 Hz	GVA●107
	110...115 V	50 Hz	GVA●115
		60 Hz	GVA●116
	120...127 V	50 Hz	GVA●125
	127 V	60 Hz	GVA●115
	200 V	50 Hz	GVA●207
	200...220 V	60 Hz	GVA●207
	220...240 V	50 Hz	GVA●225
		60 Hz	GVA●226
	380...400 V	50 Hz	GVA●385
		60 Hz	GVA●386
	415...440 V	50 Hz	GVA●415
	415 V	60 Hz	GVA●416
	440 V	60 Hz	GVA●385
	480 V	60 Hz	GVA●415
	500 V	50 Hz	GVA●505
	600 V	60 Hz	GVA●505

### Undervoltage trip, INRS (can only be mounted on GV2ME)

#### Safety device for dangerous machines conforming to INRS and VDE 0113

Side (1 block on RH side of circuit breaker GV2ME)	110...115 V	50 Hz	GVAX115
		60 Hz	GVAX116
	127 V	60 Hz	GVAX115
	220...240 V	50 Hz	GVAX225
		60 Hz	GVAX226
	380...400 V	50 Hz	GVAX385
		60 Hz	GVAX386
	415...440 V	50 Hz	GVAX415
	440 V	60 Hz	GVAX385

### Limiter blocks

Description	Mounting	Maximum number	Reference
Visible isolation block <sup>(5)</sup>	Front <sup>(1)</sup>	1	GV2AK00 <sup>(6)</sup>
Limiters	At top (GV2ME and GV2P) for circuit breakers with screw clamp connections	1	GV1L3
	Independent	1	LA9LB920

<sup>(1)</sup> Mounting of a GVAE contact block or a GV2AK00 visible isolation block on GV2P and GV2L.

<sup>(2)</sup> Choice of N/C or N/O contact operation, depending on which way round the reversible block is mounted.

<sup>(3)</sup> The GVAD is always mounted next to the circuit breaker.

<sup>(4)</sup> To order an undervoltage trip: replace the dot (●) in the reference with a U, example: GVAU025.

To order a shunt trip: replace the dot (●) in the reference with an S, example: GVAS025.

<sup>(5)</sup> Visible isolation of the 3 poles upstream of circuit breaker GV2P and GV2L.

<sup>(6)</sup> Ie Max = 32 A.

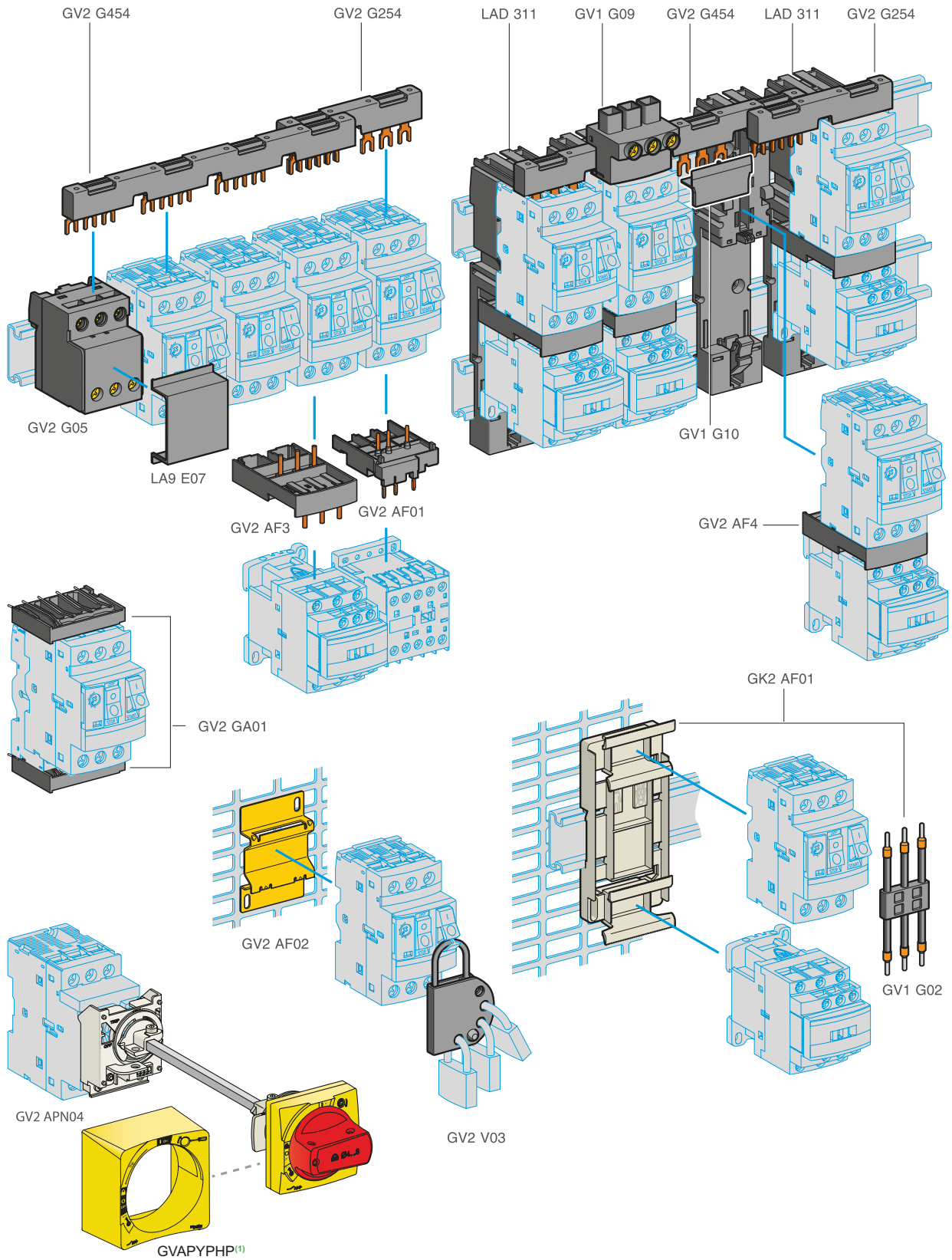


GV1L3



LA9LB920





<sup>(1)</sup> Standard front plate must be removed from the assembly and replaced by Protective front plate (GVAPYHP).



Accessories for circuit breakers with screw clamp connections				
Description	Application	Sold in lots of	Unit reference	
Adapter plates	For mounting a GV2 by screw fixing	10	GV2AF02	
	For mounting a GV2ME and contactor LC1D09...D38 with front faces aligned	1	LAD311	
Height compensation plate	7.5 mm to align GV2ME-GV2LE and GV2P-GV2L and allow the use of a common GV2G●●● busbar	10	GV1F03	
Combination blocks	Between GV2 and contactor LC1K or LP1K	10	GV2AF01	
	Between GV2 and contactor LC1D09...D38	10	GV2AF3	
	Between GV2 mounted on LAD311 and contactor LC1D09...D38	10	GV2AF4	
Motor starter adapter plate	With 3-pole connection for mounting a GV2 and a contactor LC1D09...D25	1	GK2AF01	

Description	Application	Pitch	Reference
		mm	
Sets of 3-pole Ie = 63 A busbars	2 tap-offs	45	GV2G245
		54	GV2G254
		72	GV2G272
	3 tap-offs	45	GV2G345
		54	GV2G354
	4 tap-offs	45	GV2G445
		54	GV2G454
		72	GV2G472
	5 tap-offs	54	GV2G554

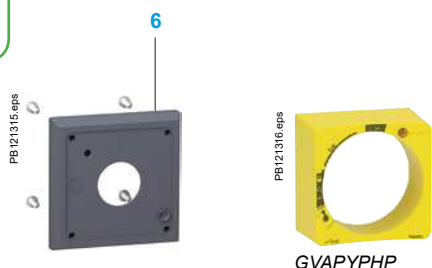
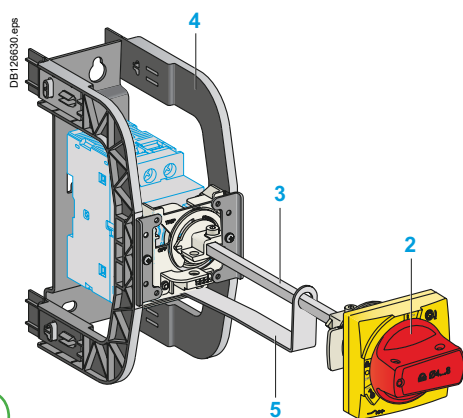
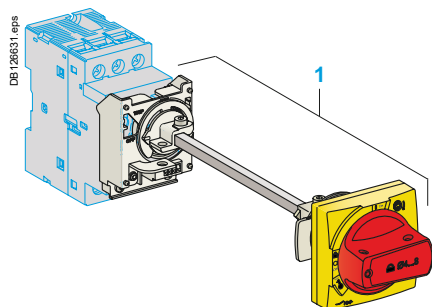
  

Description	Ie	Application	Sold in lots of	Unit reference
	A			
Protective end cover	-	For unused busbar outlets	5	GV1G10
Terminal block for supply to one or more GV2G busbar sets	63	Connection from the top	1	GV1G09
	63	Can be fitted with current limiter GV1L3 (GV2ME and GV2P)	1	GV2G05
Cover for terminal block	-	For mounting in modular panels	10	LA9E07
Flexible 3-pole connection for connecting a GV2 to a contactor LC1D09...D25	25	Centre distance between mounting rails: 100...120 mm	10	GV1G02
Set of connections upstream/downstream	16	For connecting GV2ME to a printed circuit board	10	GV2GA01
"Large Spacing" adapter UL 60947-4-1 type E	-	For GV2P●● (except 32 A)	1	GV2GH7
Clip-in marker holders (supplied with each circuit breaker)	-	For GV2P, GV2L, GV2LE and GV2RT (8 x 22 mm)	100	LA9D92



GV1G09





### Extended Rotary Handle

Allows a circuit breaker or a starter-controller installed in back of an enclosure to be operated from the front of the enclosure.

A rotary handle can be black or red/yellow, IP54 or IP65. It includes a function for locking the circuit breaker or the starter in the O (Off) for red/yellow handle, in the O (Off) or I (On) for black handle, by means of up to 3 padlocks with a shank diameter of 4 to 8 mm. The extended shaft must be adjusted to use in different size enclosures. The IP54 rotary handle is fixed with a nut (Ø22) to make easier the assembling. The new Laser Square tool brings the accuracy to align the circuit breaker and the rotary handle.

### Padlockable external operators for GV2P and GV2L

#### Description

- 1 Kit handle + mounting system
- 2 Universal handle
- 3 Shaft
- 4 Bracket
- 5 Shaft support plate for deep enclosure
- 6 Retrofit accessory
- 7 Laser Square accessory

#### Kit handle + mounting system

Description	Item	Reference
For GV2P/L	Black handle, front plate, with trip status, IP 54	1 GV2APN01
	Red handle, front plate, with trip status, IP 54	1 GV2APN02
	Black handle, front plate, without trip status, IP 65	1 GV2APN03
	Red handle, front plate, without trip status, IP 65	1 GV2APN04
For GV2LE	Padlocking in "On" and "Off" position	- GV2AP03
	Black handle, blue front plate, IP 54	

#### Universal handle

For GV2P/L	Black handle, with trip status, IP54	2 GVAPB54
	Red handle, with trip status, IP54	2 GVAPR54
	Red handle, without trip status, IP65	2 GVAPR65
	Black handle, without trip status, IP 65	2 GVAPB65

#### External handle protection frame

For GV2P/L	Yellow frame	1 GVAPYPHP
	Black frame	1 GVAPBPHP

#### Shaft

For GV2P/L	L = 315 mm	3 GVAPA1
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#### Bracket

For GV2P/L		4 GVAPH02
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#### Shaft support plate for deep enclosure

For GV2P/L	Depth ≥ 250 mm	5 GVAPK11
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#### Retrofit accessory

For GV2P/L		6 GVAPP1
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#### Laser Square accessory

For GV2P/L		7 GVAPL01
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#### Sticker

Warning label		Sold in lots of	
	For French	10	- GVAPSFR
	For English	10	- GVAPSEN
	For German	10	- GVAPSDE
	For Spanish	10	- GVAPSES
	For Chinese	10	- GVAPSCN
	For Portuguese	10	- GVAPSPT
	For Russian	10	- GVAPSRU
	For Italian	10	- GVAPSIT

### Padlocking device

Description	Reference
For all GV2 device	For use with up to 4 padlocks, Ø6 mm shank max. (padlocks not included) GV2V03



# TeSys GV3

11 to 45 kW



Circuit  
breakers



# TeSys

## TeSys GV3L Magnetic circuit breakers

### Product references



GV3L25



GV3L401



GV3L326

#### Motor circuit breakers from 11 to 45 kW

##### GV3L: control by rotary knob, connection by EverLink® BTR screw connectors

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Magnetic protection rating	Tripping current I <sub>d</sub> ± 20 %	Use in association with thermal overload relay (class 10 A)	Reference
400/415 V			500 V			690 V						
P	I <sub>cu</sub>	I <sub>cs</sub> <sup>(1)</sup>	P	I <sub>cu</sub>	I <sub>cs</sub> <sup>(1)</sup>	P	I <sub>cu</sub>	I <sub>cs</sub> <sup>(1)</sup>				
kW	kA		kW	kA		kW	kA					
11	100	100	15	12	50	18.5	6	50	25	350	LRD325	GV3L25
15	100	100	18.5	12	50	22	6	50	32	448	LRD332	GV3L32
18.5	50	100	22	12	50	37	6	50	40	560	LRD340	GV3L40
22	50	100	30	12	50	45	6	50	50	700	LRD350	GV3L50
30	50	100	37	12	50	55	6	50	65	910	LRD365	GV3L65
37	50	60	45	12	50	55	6	50	73	1120	LRD380	GV3L73
45	50	60	45	12	50	55	6	50	80	1120	LRD380	GV3L80 <sup>(2)</sup>

##### Connection by EverLink® BTR screw connectors, for assembly with a contactor

To assemble a **GV3L25** to **L73** circuit breaker with an **LC1D40A** to **D80A** contactor, it is possible to use the circuit breaker supplied without downstream EverLink® power terminal block. To order this product, add the digit **1** to the end of the references selected above. Example: **GV3L73** becomes **GV3L731**. Do not use direct mounting between **GV3L80** and **LC1D80A** because of potential overheating, use cable link.

##### Connection by lugs

To order these circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above. Example: **GV3L32** becomes **GV3L326**.

<sup>(1)</sup> As % of I<sub>cu</sub>. Associated current limiter or fuses, where required.

<sup>(2)</sup> 750 A Lock Rotor Current max.

★ > 100 kA.



# TeSys

## TeSys GV3P Thermal-magnetic circuit breakers

### Product references



GV3P80



GV3P731



GV3P736

#### Motor circuit breakers up to 45 kW / 400 V

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3									Setting range of thermal trips (2)	Magnetic tripping current Id ± 20 %	Reference
400/415 V			500 V			690 V					
P	Icu	Ics (1)	P	Icu	Ics (1)	P	Icu	Ics (1)			
kW	kA	%	kW	kA	%	kW	kA	%	A	A	
GV3P: control by rotary knob											
Connection by EverLink® BTR screw connectors (3)											
5.5	100	100	7.5	12	50	11	6	50	9...13	182	GV3P13
7.5	100	100	9	12	50	15	6	50	12...18	252	GV3P18
11	100	100	15	12	50	18.5	6	50	17...25	350	GV3P25
15	100	100	18.5	12	50	22	6	50	23...32	448	GV3P32
18.5	50	100	22	12	50	37	6	50	30...40	560	GV3P40
22	50	100	30	12	50	45	6	50	37...50	700	GV3P50
30	50	100	45	12	50	55	6	50	48...65	910	GV3P65
37	50	60	45	12	50	55	6	50	62...73	1120	GV3P73
45	50	60	45	12	50	55	6	50	70...80	1120	GV3P80 (4)

#### Connection by EverLink® BTR screw connectors, for assembly with a contactor

To assemble a **GV3P13** to **P73** circuit breaker with an **LC1D40A** to **D73A** contactor, it is possible to use the circuit breaker supplied without downstream EverLink® power terminal block. To order this product, add the digit **1** to the end of the references selected above. Example: **GV3P73** becomes **GV3P731**. Do not use direct mounting between **GV3P80** and **LC1D80A** because of potential overheating, use cable link.

#### Connection by lugs

To order thermal magnetic circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above. Example: **GV3P18** becomes **GV3P186**.

#### Motor circuit breakers up to 40 HP / 460 V, UL 60947-4-1 type E

##### GV3P13 (5) to GV3P65 (5)

To obtain a motor-circuit breaker **GV3P**, UL 60947-4-1 type E, use the following with the circuit breaker:

- a "Large Spacing" cover **GV3G66**,
- a short-circuit signalling contact **GVAM11**.

#### Motor circuit breakers from 7.5 to 50 HP / 460 V, with screw clamp terminals

##### GV3P with rotary handle

Thermal setting (A)	Maximum Horsepower ratings <sup>(6)</sup>						Reference
	Single-Phase		Three-Phase				
	115 V	230 V	200 V	230 V	460 V	575 V	
9...13	1/2	1.5	3	3	7.5	10	GV3P13
12...18	3/4	2	3	5	7.5	10	GV3P18
17...25	1.5	3	5	7.5	15	20	GV3P25
23...32	2	3	7.5	7.5	20	25	GV3P32
30...40	3	5	10	10	25	30	GV3P40
37...50	3	7.5	10	10	30	40	GV3P50
48...65	3	10	15	15	40	50	GV3P65
62...73	5	15	20	25	50	60	GV3P73

##### GV3P13 to GV3P65 - with connection by lugs (5)

To obtain a motor-circuit breaker **GV3P**, UL 60947-4-1 type E, with connection by lugs, add the digit **6** to the end of reference selected above and use the following with the circuit breaker:

- two IP 20 covers **LAD96570**,
- a short-circuit signalling contact **GVAM11**.

(1) As % of Icu.

(2) The thermal trip setting must be within the range marked on the graduated knob.

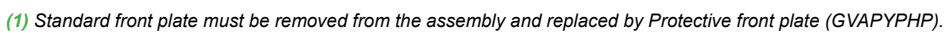
(3) BTR screws: hexagon socket head. Require use of an insulated Allen key, in compliance with local wiring regulations.

(4) 750 A Lock Rotor Current max.

(5) Accessories: see page B6/30.

(6) 3P FLA corresponding values : see page A6/58.







## Contact blocks

Description	Mounting	Maximum number	Type of contacts	Sold in lots of	Unit reference
Instantaneous auxiliary contacts	Front	1	N/O or N/C <sup>(1)</sup>	10	GVAE1
			N/O + N/C	10	GVAE11 <sup>(2)</sup>
			N/O + N/O	10	GVAE20 <sup>(2)</sup>
	Side (LH)	2	N/O + N/C	1	GVAN11 <sup>(2)</sup>
			N/O + N/O	1	GVAN20 <sup>(2)</sup>
Fault signalling contact + instantaneous auxiliary contact	Front	1	N/O (fault)	+ N/O	GVAED101 <sup>(2)</sup>
			N/O (fault)	+ N/C	GVAED011 <sup>(2)</sup>
	Side <sup>(3)</sup> (LH)	1	N/O (fault)	+ N/O	GVAD1010
				+ N/C	GVAD1001
			N/C (fault)	+ N/O	GVAD0110
				+ N/C	GVAD0101
Short-circuit signalling contact	Side (LH)	1	C/O common point	1	GVAM11

Electric trips - undervoltage or shunt <sup>(4)</sup>

Mounting	Voltage	Reference
Side (1 block on RH side of circuit breaker)	24 V	50 Hz GVA●025
		60 Hz GVA●026
	48 V	50 Hz GVA●055
		60 Hz GVA●056
	100	50 Hz GVA●107
	100...110 V	60 Hz GVA●107
	110...115 V	50 Hz GVA●115
		60 Hz GVA●116
	120...127 V	50 Hz GVA●125
	127 V	60 Hz GVA●115
	200 V	50 Hz GVA●207
	200...220 V	60 Hz GVA●207
	220...240 V	50 Hz GVA●225
		60 Hz GVA●226
	380...400 V	50 Hz GVA●385
		60 Hz GVA●386
	415...440 V	50 Hz GVA●415
	415 V	60 Hz GVA●416
	440 V	60 Hz GVA●385
	480 V	60 Hz GVA●415
	500 V	50 Hz GVA●505
	600 V	60 Hz GVA●505

## Accessories

Description	Reference
Set of 3-pole busbars I <sub>e</sub> = 115 A Pitch: 64 mm	2 tap-off GV3P●● and GV3L●● GV3G264
	3 tap-off GV3P●● and GV3L●● GV3G364
Cover "Large Spacing" UL 60947-4-1 type E (Only one cover required on supply side)	GV3P●● GV3G66

- (1) Choice of N/C or N/O contact operation, depending on which way round the reversible block is mounted.  
 (2) Contact blocks available in version with spring terminal connections. Add a figure 3 at the end of the references selected above.  
 Example: **GVAED101** becomes **GVAED1013**.  
 (3) The **GVAD●●** is always mounted next to the circuit breaker.  
 (4) To order an undervoltage trip: replace the dot (●) in the reference with a **U**, example: **GVAU025**.  
 To order a shunt trip: replace the dot (●) in the reference with an **S**, example: **GVAS025**.

PB10836 eps



GV3G66

PB121324 eps



LV426992



LV426990

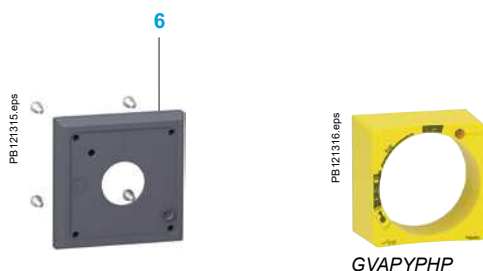
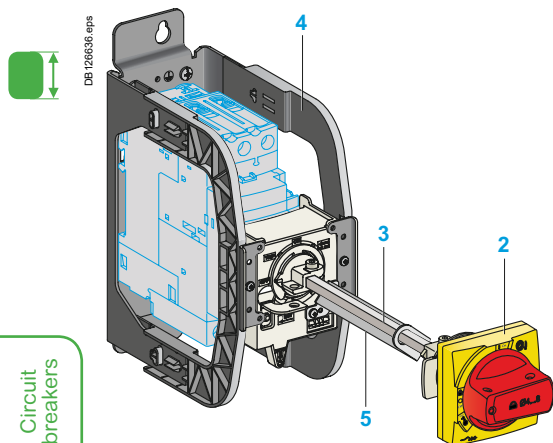
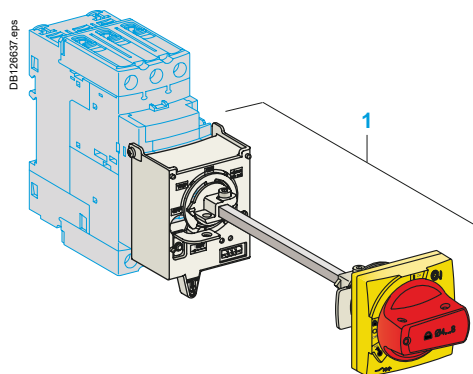
Limited torque throwaway bits

## Torque limiting breakaway bits

Description	Sold in lots of	Reference
5 N.m Yellow	6	LV426992
9 N.m Green	6	LV426990







### Extended Rotary Handle

Allows a circuit breaker or a starter-controller installed in back of an enclosure to be operated from the front of the enclosure.

A rotary handle can be black or red/yellow, IP54 or IP65. It includes a function for locking the circuit breaker or the starter in the O (Off) or I (On) position (depending of the type of rotary handle) by means of up to 3 padlocks with a shank diameter of 4 to 8 mm. The extended shaft must be adjusted to use in different size enclosures. The IP54 rotary handle is fixed with a nut (Ø22) to make easier the assembling. The new Laser Square tool brings the accuracy to align the circuit breaker and the rotary handle.

### Padlockable external operators for GV3 and GV3L

#### Description

- 1 Kit handle + mounting system
- 2 Universal handle
- 3 Shaft
- 4 Bracket
- 5 Shaft support plate for deep enclosure
- 6 Retrofit accessory
- 7 Laser Square accessory

#### Kit handle + mounting system

Description	Item	Reference
For GV3P/L Black handle, front plate, with trip status, IP 54	1	GV3APN01
Red handle, front plate, with trip status, IP 54	1	GV3APN02
Black handle, front plate, without trip status, IP65	1	GV3APN03
Red handle, front plate, without trip status, IP 65	1	GV3APN04

#### Universal handle

For GV3P/L Black handle, with trip status, IP54	2	GVAPB54
Red handle, with trip status, IP54	2	GVAPR54
Black handle, without trip status, IP65	2	GVAPB65
Red handle, without trip status IP65	2	GVAPR65

#### External handle protection frame

For GV2P/L Yellow frame	1	GVAPYPHP
Black frame	1	GVAPBPHP

#### Shaft

For GV3P/L L = 315 mm	3	GVAPA1
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#### Bracket

For GV3P/L	4	GVAPH03
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#### Shaft support plate for deep enclosure

For GV3P/L Depth ≥ 300 mm	5	GVAPK12
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#### Retrofit accessory

For GV3P/L	6	GVAPP1
------------	---	--------

#### Laser Square accessory

For GV3P/L	7	GVAPL01
------------	---	---------

Sticker	Sold in lots of		
Warning label	For French	10	- GVAPSFR
	For English	10	- GVAPSEN
	For German	10	- GVAPSDE
	For Spanish	10	- GVAPSES
	For Chinese	10	- GVAPSCN
	For Portuguese	10	- GVAPSPT
	For Russian	10	- GVAPSRU
	For Italian	10	- GVAPSIT



# TeSys GV4

0.25 to 55 kW - 1/2 to 60 HP



Circuit  
breakers



### Protection

TeSys GV4 motor circuit breaker covers motor protection from 0.25 to 55 kW at 415 V AC (from 0.8 to 115 A) in one frame and is available in 3 breaking capacities: 25, 50 and 100 kA at 415 V AC IEC (15, 35, 65 kA at 480 V UL).

TeSys GV4 is available with 3 types of protection:

- Magnetic GV4L: to be used with an overload relay or a drive
- Thermal magnetic GV4P: electronic protection with wide range setting, dual class (10 & 20)
- Multifunction motor protection GV4PEM: GV4P with adjustable advanced protections and possibility to have a side module SDx for alarming and motor functional fault differentiation.

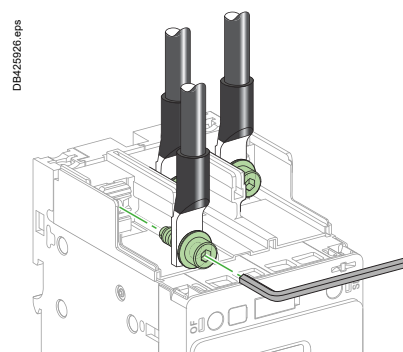
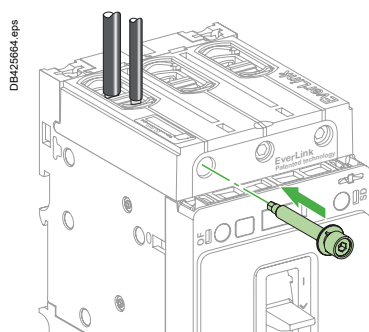
### Power connection

TeSys GV4 comes in standard with 2-holes EverLink™ power connectors with creep <sup>(1)</sup> compensation for bare copper cables. This Schneider Electric patented technique makes it possible to achieve accurate and durable tightening torque in order to avoid cable creep.

Products may be delivered with connectors for bars or cables with compression lugs (except GV4PB).

Whatever, the connectors are field interchangeable and can be removed for the installation of one of both.

And to tight at the right torque power connections particularly in the field, torque limiting breakaway bits may be used.



### Mounting

TeSys GV4 can be mounted on a backplate or on a DIN rail (35 or 75 mm).

### Handle

TeSys GV4 can be ordered with a toggle or a direct rotary handle (except for GV4P Multifunction).

It is also possible to equip a toggle one with a direct rotary handle, or a front extended one, or a side one.

### Auxiliaries

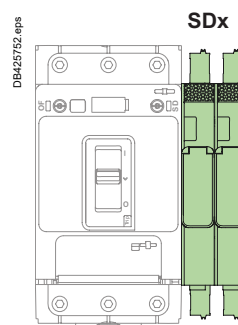
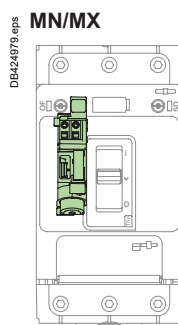
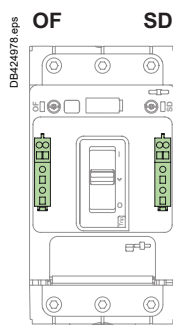
TeSys GV4 circuit breakers can be equipped with an open/close (OF) contact and a trip indication (SD) contact.

These contacts are common point changeover type, with a normally open (NO) and a normally closed (NC) contact.

TeSys GV4 may be equipped too with an MN (undervoltage release) or MX (shunt trip) coil.

GV4P Multifunction circuit breakers can be equipped with 1 or 2 SDx module(s) in order to have alarming and motor functional fault differentiation (SDx - See page B6/44)

Auxiliaries have spring connections for cables up to 1.5 mm<sup>2</sup>.



<sup>(1)</sup> Creep: normal crushing phenomenon of conductors, that is accentuated over time.

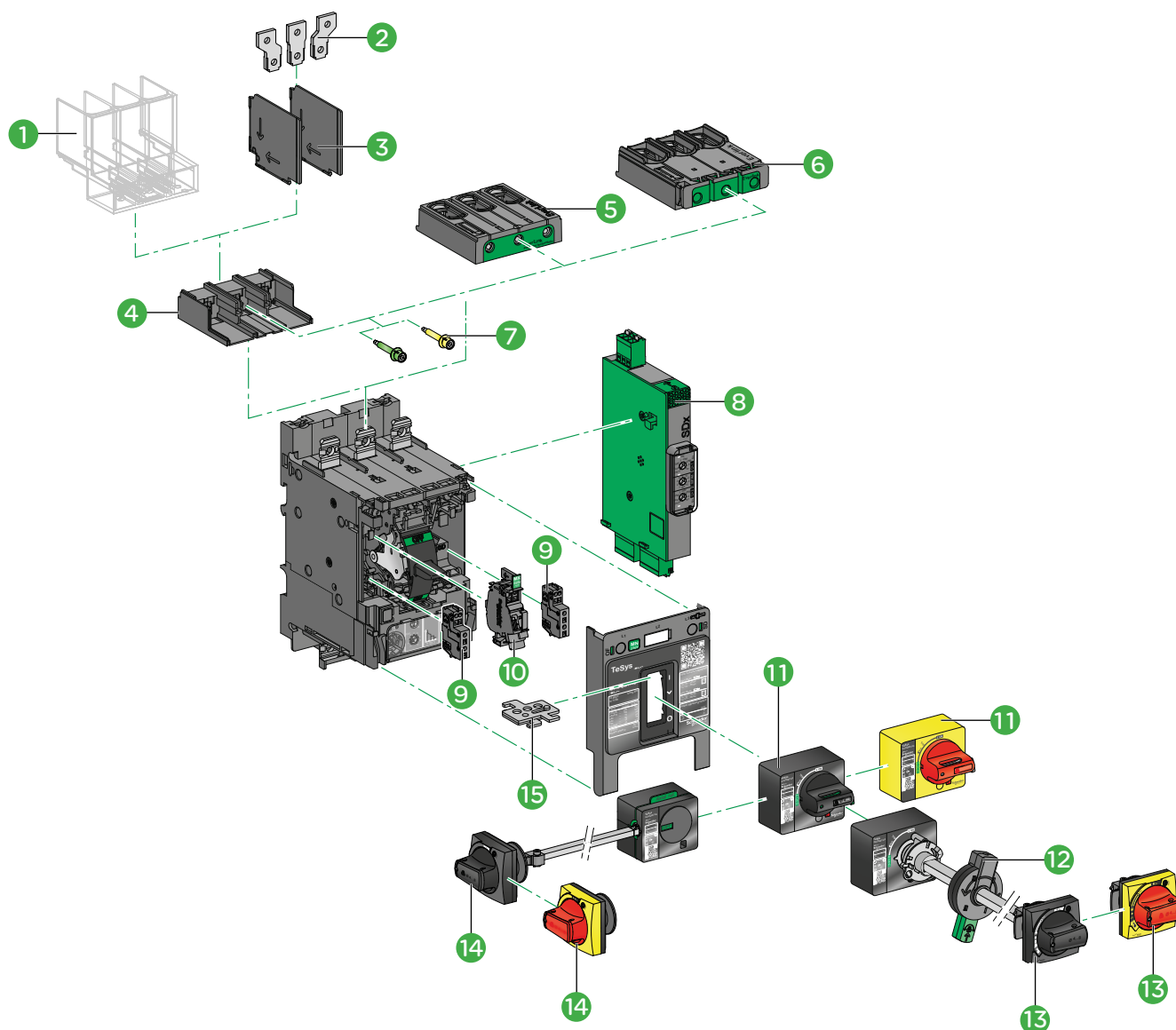


# TeSys

## TeSys GV4 Motor circuit breakers

### Introduction

DB432920.ai



Circuit  
breakers

- 1 Long terminal shield **LAD96590**
- 2 Terminal spreaders **LV426940**
- 3 Interphases barriers **LV426920**
- 4 Crimp lug connector **GV4LUG**
- 5 EverLink® connector **LAD96595**
- 6 Everlink® terminals and large spacing cover **GV4G66 + LAD96595**
- 7 Torque limiting breakaway bits **LV42699●**
- 8 SDx alarming/fault differentiation module **GV4ADM1111** (only with GV4PEM)
- 9 Auxiliary contact block for OF or SD function **GV4AE11**
- 10 - MN undervoltage release **GV4AU●●**  
- MX shunt trip **GV4AS●●**
- 11 Direct mounting black or red on yellow bezel rotary handle **GV4ADN01/ GV4ADN02**
- 12 Open door shaft operator (for front extended rotary handle) **LV426937**
- 13 Front extended rotary handle kit with red handle on yellow bezel or black handle **GV4APN01/ GV4APN02 /GV4APN04**
- 14 Side rotary handle kit with red handle on yellow bezel or black handle **LV426935/LV426936**.
- 15 Toggle locking device **29370**





GV4L



GV4LE

Ref.



Circuit  
breakers

### Protection

Setting is made using dial.

#### Trip class (class)

GV4L can be used with class 5, 10 or 20 relay.

#### Short circuit protection (Ii)

Protection with an adjustable pick-up  $I_i = 6 \text{ to } 14 I_n$ . Settings are made in amperes.

#### Standards and certifications

IEC/EN 60947-1, IEC/EN 60947-2, CCC, EAC.



Magnetic motor circuit breakers from 0.25 to 55 kW													
Standard power ratings of 3-phase motors - 50 / 60 Hz									In  A	Magnetic setting range (li)  A	Use in association with overload relay Class 10 or 20	Reference with EverLink terminals	
400/415 V			500 V			690 V						with toggle	with rotary handle
P kW	Icu kA	Ics <sup>(1)</sup> %	P kW	Icu kA	Ics <sup>(1)</sup> %	P kW	Icu kA	Ics <sup>(1)</sup> %					
0.25... 0.75	25	100	0.37... 1.1	10	100	0.55... 1.5	-	-	2	12... 28	LRD05 (0.63... 1A) LRD06 (1... 1.6A) LRD07 (1.6... 2.5A)	-	-
	50	100		25	100		8	25				GV4LE02N	GV4L02N
	100	100		30	100		10	25				GV4LE02S	-
0.55... 1.5	25	100	0.75... 1.5	10	100	1.1... 2.2	-	-	3,5	21... 49	LRD07 (1.6... 2.5A) LRD08 (2.5... 4A)	-	-
	50	100		25	100		8	25				GV4LE03N	GV4L03N
	100	100		30	100		10	25				GV4LE03S	-
1.5... 3	25	100	2.2... 4	10	100	3... 7.5	-	-	7	42... 98	LRD08 (2.5... 4A) LRD10 (4... 6A)	-	-
	50	100		25	100		8	25				GV4LE07N	GV4L07N
	100	100		30	100		10	25				GV4LE07S	-
3... 5.5	25	100	3... 7.5	10	100	5.5... 11	-	-	12,5	75... 175	LRD12 (5.5... 8A) LRD14 (7... 10A) LRD313 (9... 13A)	-	-
	50	100		25	100		8	25				GV4LE12N	GV4L12N
	100	100		30	100		10	25				GV4LE12S	-
5.5... 11	25	100	7.5... 15	10	100	7.5... 18.5	-	-	25	150... 350	LRD318 (12... 18A) LRD325 (17... 25A)	GV4LE25B	GV4L25B
	50	100		25	100		8	25				GV4LE25N	GV4L25N
	100	100		30	100		10	25				GV4LE25S	-
11... 22	25	100	15... 30	10	100	18.5... 45	-	-	50	300... 700	LRD332 (23... 32A) LRD340 (30... 40A) LRD350 (37... 50A)	GV4LE50B	GV4L50B
	50	100		25	100		8	25				GV4LE50N	GV4L50N
	100	100		30	100		10	25				GV4LE50S	-
18.5... 37	25	100	22... 55	10	100	30... 55	-	-	80	480... 1120	LRD365 (48... 65A) LRD3363 (63... 80A)	GV4LE80B	GV4L80B
	50	100		25	100		8	25				GV4LE80N	GV4L80N
	100	100		30	100		10	25				GV4LE80S	GV4L80S
30... 55	25	100	30... 75	10	100	45... 90	-	-	115	690... 1610	LR9D5567 (60... 100A) LR9F5367 (60... 100A) LR9D5369 (90... 150A) LR9F5369 (90... 150A)	GV4LE115B	GV4L115B
	50	100		25	100		8	25				GV4LE115N	GV4L115N
	100	100		30	100		10	25				GV4LE115S	GV4L115S

**Connection by lugs**

To order circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above. Example: **GV4LE02N** becomes **GV4LE02N6**.

(1) As % of Icu.



Circuit breakers





GV4P



GV4PE

Circuit  
breakers

### Protection

Settings are made using dials.

#### Overload or thermal protection ( $I_r$ )

Inverse-time thermal protection against overloads with adjustable pick-up  $I_r$ .

Wide range setting made in amperes.

The tripping curve for the thermal protection, which indicates the time delay  $t_r$  before tripping, is defined by the selected trip class.

#### Trip class (class)

The class is selected as a function of the normal motor starting time.

■ Class 10: starting time less than 10 s.

■ Class 20: starting time less than 20 s.

For a given class, it is necessary to check that all motor-feeder components are sized to carry the  $7.2 I_r$  starting current without excessive temperature rise during the time corresponding to the class.

#### Short time delay protection ( $I_{sd}$ )

Short time delay protection (around 100 ms) to let through motor starting currents, but to protect cables and motor starter devices and allow not to oversize them (particularly usefull for wide range settings circuit breakers).

Fixed pick-up  $I_{sd} = 13 I_r$ .

#### Short-circuit protection ( $I_i$ )

Instantaneous protection with non-adjustable pick-up  $I_i = 17 I_n$ .

#### Phase unbalance or phase loss ( $I_{unbal}$ , $I_{tunbal}$ )

This function opens the circuit breaker if a phase unbalance occurs:

■ that is greater than the 30 % of  $I_{rms}$  (fixed pick-up):  **$I_{unbal}$**

■ following the non-adjustable time delay ( **$I_{tunbal}$** ) equal to:

□ 0.7 s during starting

□ 4 s during normal operation.

Phase loss is an extreme case of phase unbalance and leads to tripping under the same conditions.

#### Ground-fault protection ( $I_g$ , $t_g$ )

Residual type ground-fault protection:

■ fixed pick-up  $I_g = I_n$

■ fixed time delay  $t_g = 0.1$  s.

### Indications

#### Front indications

■ Green "Ready" LED: flashes slowly when the circuit breaker is ready to trip in the event of an abnormal deviation in engine operating conditions.

■ Red alarm LED: goes ON when the thermal image of the motor is greater than 95 % of the permissible temperature rise.

### Standards and certifications

IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1, UL 60497-4-1, CSA 22.2 n° 60497-4-1, CCC, EAC, CSA (cCSAus).



Thermal magnetic motor circuit breakers from 0.25 to 55 kW											
Standard power ratings of 3-phase motors - 50 / 60 Hz in category AC-3									Thermal setting range (Ir)	Reference with EverLink terminals	
400/415 V			500 V			690 V					
P kW	Icu kA	Ics <sup>(1)</sup> %	P kW	Icu kA	Ics <sup>(1)</sup> %	P kW	Icu kA	Ics <sup>(1)</sup> %	A	with toggle	with rotary handle
0.25... 0.75	25	100	0.37... 1.1	10	100	0.55... 1.5	-	-	0.8... 2	-	-
	50	100		25	100		8	25		GV4PE02N	GV4P02N
	100	100		30	100		10	25		GV4PE02S	-
0.55... 1.5	25	100	0.75... 1.5	10	100	1.1... 2.2	-	-	1.4... 3.5	-	-
	50	100		25	100		8	25		GV4PE03N	GV4P03N
	100	100		30	100		10	25		GV4PE03S	-
1.5... 3	25	100	2.2... 4	10	100	3... 7.5	-	-	2.9... 7	-	-
	50	100		25	100		8	25		GV4PE07N	GV4P07N
	100	100		30	100		10	25		GV4PE07S	-
3... 5.5	25	100	3... 7.5	10	100	5.5... 11	-	-	5... 12.5	-	-
	50	100		25	100		8	25		GV4PE12N	GV4P12N
	100	100		30	100		10	25		GV4PE12S	-
5.5... 11	25	100	7.5... 15	10	100	7.5... 18.5	-	-	10... 25	GV4PE25B	GV4P25B
	50	100		25	100		8	25		GV4PE25N	GV4P25N
	100	100		30	100		10	25		GV4PE25S	-
11... 22	25	100	15... 30	10	100	18.5... 45	-	-	20... 50	GV4PE50B	GV4P50B
	50	100		25	100		8	25		GV4PE50N	GV4P50N
	100	100		30	100		10	25		GV4PE50S	-
22... 37	25	100	30... 55	10	100	37... 55	-	-	40... 80	GV4PE80B	GV4P80B
	50	100		25	100		8	25		GV4PE80N	GV4P80N
	100	100		30	100		10	25		GV4PE80S	GV4P80S
37... 55	25	100	45... 75	10	100	75... 90	-	-	65... 115	GV4PE115B	GV4P115B
	50	100		25	100		8	25		GV4PE115N	GV4P115N
	100	100		30	100		10	25		GV4PE115S	GV4P115S

Thermal magnetic motor circuit breakers from 3/4 to 75 HP / 480 V											
Single-Phase 120 V				3-Phase							
240 V		240 V		208 V		240 V		480 V		600 V	
Power HP	FLA A	Power Hp	FLA A	Power Hp	FLA A	Power Hp	FLA A	Power Hp	FLA A	Power Hp	FLA A
-	-	1/10	1.5	-	-	-	-	3/4	1.6	1	1.7
1/10	3	1/4	2.9	1/2	2.4	3/4	3.2	2	3.4	2	2.7
1/4	5.8	3/4	6.9	1-1/2	6.6	2	6.8	3	4.8	5	6.1
1/2	9.8	1-1/2	10	3	10.6	3	9.6	7-1/2	11	10	11
1-1/2	20	3	17	5	16.7	7-1/2	22	15	21	20	22
3	34	7-1/2	40	10	30.8	15	42	30	40	40	41
7-1/2	80	15	68	25	74.8	30	80	60	77	75	77
10	100	20	88	30	88	40	104	75	96	100	99

## Connection by lugs

To order circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above. Example: **GV4PE02N** becomes **GV4PE02N6**.

<sup>(1)</sup> As % of Icu.

Characteristics:  
pages B6/112 to B6/115

Curves:  
pages B6/121 to B6/123

Dimensions, schemes:  
pages B6/126, B6/127, B6/129





GV4PEM

### Basic protection

Settings are made using dials.

#### Overloads or thermal protection (Ir)

Inverse-time thermal protection against overloads with adjustable pick-up Ir.

Wide range setting made in amperes.

The tripping curve for the thermal protection, which indicates the time delay tr before tripping, is defined by the selected trip class.

#### Trip class (class)

The class is selected as a function of the normal motor starting time.

■ Class 10: starting time less than 10 s.

■ Class 20: starting time less than 20 s.

For a given class, it is necessary to check that all motor-feeder components are sized to carry the 7.2 Ir starting current without excessive temperature rise during the time corresponding to the class.

#### Short-circuit protection (Ii)

Instantaneous protection with non-adjustable pick-up Ii = 17 In.

### Advanced protection

Settings are made with an Android smartphone with dedicated application and using wireless NFC (Near Field Communication), or a computer with EcoStruxure Power Commission software and the configuration/maintenance tool kit ("Maintenance case" TRV00910).

The LV434206 pocket battery allows the GV4PEM controller to be powered for adjustments and tests when no internal source is available.

#### Short time delay protection (Isd)

Short time delay protection (around 100 ms) to let through motor starting currents, but to protect cables and motor starter devices and allow not to oversize them (particularly useful for wide range settings circuit breakers).

Adjustable pick-up Isd = 5...13 Ir (13 by default).

#### Phase unbalance or phase loss (Iunbal, tunbal)

This function opens the circuit breaker if a phase unbalance occurs:

■ that is greater than the 10...40 % of Irms (30% by default): **Iunbal**

■ following a time delay (**tunbal**) equal to:

□ 0.7 s during starting (non adjustable)

□ 1...10 s during normal operation (4 s by default).

Phase loss is an extreme case of phase unbalance and leads to tripping under the same conditions.

#### Ground-fault protection (Ig, tg)

Residual type ground-fault protection, with OFF position:

■ adjustable pick-up Ig:

□ 0.7...1 In for products with nominal current from 2 to 50 A

□ 0.4...1 In for products with nominal current from 80 to 115 A

■ adjustable time delay tg 0.1...0.4 s.

#### Jam (Ijam, tjam)

This function detects locking of the motor shaft caused by the load, with OFF position (OFF by default). During motor starting the function is disabled.

During normal operation, it causes tripping:

■ above the **Ijam** pick-up that can be fine-adjusted from 1.5 to 8 Ir

■ in conjunction with the **tjam** time delay that can be adjusted from 1 to 30 s.

#### Long start (Ilong, tlong)

This protection supplements thermal protection (class). It is used to optimize the protection according to the starting parameters, with OFF position (OFF by default).

It detects abnormal motor starting i.e. when the starting current remains too high or too low with respect to a pick-up value and a time delay.

It causes tripping:

■ in relation with a **Ilong** pick-up that can be fine-adjusted from 1.5 to 8 Ir

■ in conjunction with the **tlong** time delay that can be adjusted from 1 to 200 s.

### Indications

#### Front indications

■ Green "Ready" LED: flashes slowly when the circuit breaker is ready to trip in the event of an abnormal deviation in engine operating conditions.

■ Red alarm LED: goes ON when the thermal image of the motor is greater than 95 % of the permissible temperature rise.

#### Remote indications via SDx module

See description on page B6/44.

#### Standards and certifications

IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1, UL 60497-4-1, CSA 22.2 n° 60497-4-1, CCC, EAC, CSA (cCSAus).



Thermal magnetic motor circuit breakers from 0.25 to 55 kW										
Standard power ratings of 3-phase motors - 50 / 60 Hz in category AC-3									Thermal setting range (I <sub>r</sub> )	"Reference with EverLink terminals" with toggle
400/415 V			500 V			690 V				
P kW	I <sub>cu</sub> kA	I <sub>cs</sub> <sup>(1)</sup> %	P kW	I <sub>cu</sub> kA	I <sub>cs</sub> <sup>(1)</sup> %	P kW	I <sub>cu</sub> kA	I <sub>cs</sub> <sup>(1)</sup> %	A	
0.25... 0.75	25	100	0.37... 1.1	10	100	0.55... 1.5	-	-	0.8... 2	-
	50	100		25	100		8	25		GV4PEM02N
	100	100		30	100		10	25		GV4PEM02S
0.55... 1.5	25	100	0.75... 1.5	10	100	1.1... 2.2	-	-	1.4... 3.5	-
	50	100		25	100		8	25		GV4PEM03N
	100	100		30	100		10	25		GV4PEM03S
1.5... 3	25	100	2.2... 4	10	100	3... 7.5	-	-	2.9... 7	-
	50	100		25	100		8	25		GV4PEM07N
	100	100		30	100		10	25		GV4PEM07S
3... 5.5	25	100	3... 7.5	10	100	5.5... 11	-	-	5... 12.5	-
	50	100		25	100		8	25		GV4PEM12N
	100	100		30	100		10	25		GV4PEM12S
5.5... 11	25	100	7.5... 15	10	100	7.5... 18.5	-	-	10... 25	GV4PEM25B
	50	100		25	100		8	25		GV4PEM25N
	100	100		30	100		10	25		GV4PEM25S
11... 22	25	100	15... 30	10	100	18.5... 45	-	-	20... 50	GV4PEM50B
	50	100		25	100		8	25		GV4PEM50N
	100	100		30	100		10	25		GV4PEM50S
22... 37	25	100	30... 55	10	100	37... 55	-	-	40... 80	GV4PEM80B
	50	100		25	100		8	25		GV4PEM80N
	100	100		30	100		10	25		GV4PEM80S
37... 55	25	100	45... 75	10	100	75... 90	-	-	65... 115	GV4PEM115B
	50	100		25	100		8	25		GV4PEM115N
	100	100		30	100		10	25		GV4PEM115S

**Connection by lugs**

To order circuit breakers with connection by lugs, add the digit **6** to the end of reference selected above. Example: **GV4PE02N** becomes **GV4PE02N6**.

(1) As % of I<sub>cu</sub>.







GV4PB

GV4PB is based on GV4PEM with specific tripping curve to follow UL489 SH supplement. It is designed with a large space connector in order to increase creepage and clearance distance.

### Basic protection

Settings are made using dials.

#### Overloads or thermal protection (Ir)

Inverse-time thermal protection against overloads with adjustable pick-up  $I_r$ . Wide range setting made in amperes.

The tripping curve for the thermal protection, which indicates the time delay  $t_r$  before tripping, is defined by the selected trip class.

#### Trip class (class)

The class is selected as a function of the normal motor starting time. It corresponds to the value of the tripping time delay for a current of 600 % of the rated tripping current according to UL489, SH supplement.

The rated tripping current is selected as 125 % of the dial value.

■ Class 10: starting time less than 10 s.

■ Class 20: starting time less than 20 s.

For a given class, it is necessary to check that all motor-feeder components are sized to withstand the 7.5  $I_r$  starting current without excessive temperature rise during the time corresponding to the class.

#### Short-circuit protection (Ii)

Instantaneous protection with non-adjustable pick-up  $I_i=17 I_n$ .

### Advanced protection (same as GV4PEM)

Settings are made with:

■ Android smartphone using wireless NFC (Near Field Communication), or EcoStruxure Power Device App. computer + EcoStruxure Power Commission software and configuration/maintenance tool kit TRV00910

■ LV434206 pocket battery, allows the GV4PB controller to be powered for adjustment and test. LV434206 pocket battery needs to be connected to the GV4PB controller to set the advanced protection.

#### Short time delay protection (I<sub>sd</sub>)

Short time delay protection (around 100 ms) to let through motor starting currents, but to protect cables and motor starter devices and allow not to oversize them (particularly usefull for wide range settings circuit breakers).

Adjustable pick-up  $I_{sd} = 5...13 I_r$  (13 by default).

#### Phase unbalance or phase loss (I<sub>unbal</sub>, I<sub>tunbal</sub>)

This function opens the circuit breaker if a phase unbalance occurs:

■ that is greater than the 10...40 % of  $I_{rms}$  (30 % by default): **I<sub>unbal</sub>**

■ following a time delay (**I<sub>tunbal</sub>**) equal to:

□ 0.7 s during starting (non adjustable)

□ 1...10 s during normal operation (4 s by default).

Phase loss is an extreme case of phase unbalance and leads to tripping under the same conditions.

#### Ground-fault protection (I<sub>g</sub>, t<sub>g</sub>)

Residual type ground-fault protection, with OFF position:

■ adjustable pick-up **I<sub>g</sub>**:

□ 0.7...1 In for products with nominal current from 2 to 50 A

□ 0.4...1 In for products with nominal current from 80 to 115 A

■ adjustable time delay **t<sub>g</sub>** 0.1...0.4 s.

#### Jam (I<sub>jam</sub>, t<sub>jam</sub>)

This function detects locking of the motor shaft caused by the load, with OFF position (OFF by default). During motor starting the function is disabled.

During normal operation, it causes tripping:

■ above the **I<sub>jam</sub>** pick-up that can be fine-adjusted from 1.5 to 8  $I_r$

■ in conjunction with the **t<sub>jam</sub>** time delay that can be adjusted from 1 to 30 s.

#### Long start (I<sub>long</sub>, t<sub>long</sub>)

This protection supplements thermal protection (class). It is used to optimize the protection according to the starting parameters, with OFF position (OFF by default).

It detects abnormal motor starting i.e. when the starting current remains too high or too low with respect to a pick-up value and a time delay.

It causes tripping:

■ in relation with a **I<sub>long</sub>** pick-up that can be fine-adjusted from 1.5 to 8  $I_r$

■ in conjunction with the **t<sub>long</sub>** time delay that can be adjusted from 1 to 200 s.

### Indications

#### Front indications

■ Green "Ready" LED: flashes slowly when the circuit breaker is ready to trip in the event of an abnormal deviation in engine operating conditions.

■ Red alarm LED: goes ON when the thermal image of the motor is greater than 95 % of the permissible temperature rise

#### Remote indications via SDx module

See description on page B6/44.

#### Conforming to standards:

IEC/EN 60947-2, IEC/EN 60947-4-1

#### Product certifications:

UL 489, CSA C22.2 n°5.



GV4PB - selection according to Short Circuit Current Rating (SCCR)			
240 V AC SCCR kA	480Y/277 V AC SCCR kA	600Y/347 V AC SCCR kA	Reference
35	18	14	GV4PB●●●B <sup>(1)</sup>
65	35	18	GV4PB●●●N
100	65	25	GV4PB●●●S

(1) Example: GV4PB07S, GV4PB115S.

GV4PB thermal magnetic motor circuit breakers - selection according to FLA							
3P 200 V FLA A	3P 230 V FLA A	3P 460 V FLA A	Rated %	Dial range A	Reference		
-	-	1.6	100	0.8 to 2		GV4PB02N	GV4PB02S
2.5	2.2	3	100	1.4 to 3.5		GV4PB03N	GV4PB03S
4.8	4.2	4.8	100	2.9 to 7		GV4PB07N	GV4PB07S
7.8	9.6	7.6	100	5 to 12.5		GV4PB12N	GV4PB12S
17.5	22	21	100	10 to 25	GV4PB25B	GV4PB25N	GV4PB25S
48	42	40	100	20 to 50	GV4PB50B	GV4PB50N	GV4PB50S
62	54	52	80	40 to 80	GV4PB80B	GV4PB80N	GV4PB80S
92	80	77	80	65 to 115	GV4PB115B	GV4PB115N	GV4PB115S

#### Connection by lugs

Please order GV4LUG accessory and LV426920 interphase barriers or L1D96590 terminal shield.

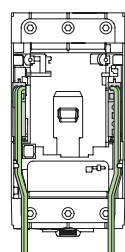
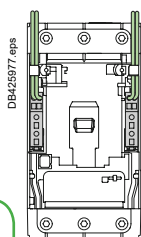
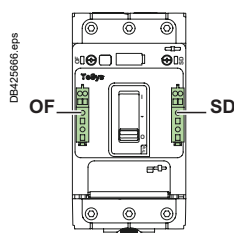
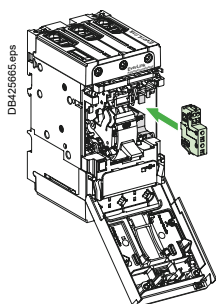


Circuit  
breakers

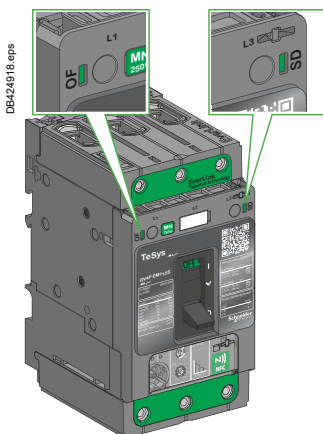




GV4AE11 auxiliary contact block



Pluggable auxiliary contact - OF or SD is dependent on cavity. Multiple internal wiring possibilities, even with long terminal shields



Visible presence of auxiliary contact block in OF or SD cavity

## Auxiliary contact blocks

Auxiliary contacts give an indication of the circuit breaker status.

They can be used for remote visual signaling, alarming, electrical locking, relay activation, etc...

An auxiliary contact block provides one changeover contact with common point for OF or SD function, depending on the breaker cavity where it is inserted.

### Auxiliary contact - Open/Close OF function

Indicates Open/Closed position of the circuit breaker contacts.

### Auxiliary contact - Trip alarm SD function

■ Indicates that the circuit breaker has tripped due to:

- ☐ Electrical fault (overload, short circuit, ...)
- ☐ shunt trip
- ☐ undervoltage release
- ☐ "push-to-trip" button.

■ Resets when circuit breaker is reset.

## Electrical characteristic

### Characteristics

Rated thermal current (A)	5				
Minimum load	2 mA at 17 V DC				
Utilization cat. (IEC 60947-5-1)	AC12	AC15	DC12	DC13	DC14
Operational current (A)					
24 V AC/DC	5	5	5	2.5	1
48 V AC/DC	5	5	2.5	1.2	0.2
110...127 V AC / 110 V DC	5	4	0.6	0.35	0.05
220/240 V AC	5	3	-	-	-
250 V DC	-	-	0.3	0.05	0.03
380/440 V AC	5	2.5	-	-	-
660/690 V AC	5	0.11	-	-	-

Pilot duty B600 according UL508 and CSA 22.2 n°14.

## Installation and connection

■ Auxiliary contact blocks snap into left (for OF function) and right (for SD function) cavities behind the front accessory cover of the circuit breaker and their presence is visible on the front face through green flags.

■ One model serves for all indication functions depending on where it is fitted in the circuit breaker.

■ Each NO and NC spring terminal may be connected by one 0.5...1.5 mm<sup>2</sup> flexible copper wire and by two for the common point.

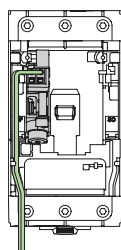
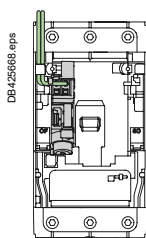
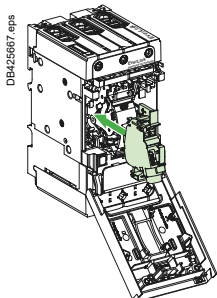
■ Wires can be exited out of any of the four corners of the breaker under the accessory cover.

Description	Maximum number	Mounting	Type of contacts	Sold in lots of	Reference
Auxiliary contact block for OF or SD indication	2 (1 OF + 1 SD)	Internal plug-in	NO + NC	1	GV4AE11

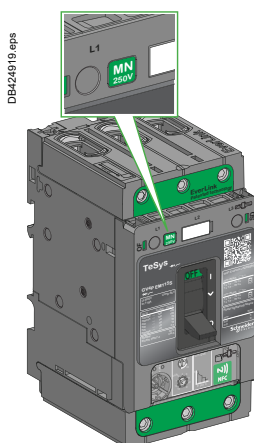




GV4AS137 shunt trip



MN or MX plugged into cavity. Multiple internal wiring possibilities, even with long terminal shields



Visible presence of MN undervoltage release in circuit breaker cavity, visible rated voltage through the window.

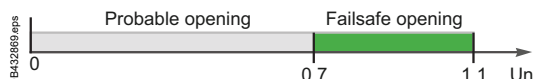
### MX shunt trip, MN undervoltage release

MX and MN trip the circuit breaker on a control signal. They are mainly used for remote and emergency-off commands.

It is advised to test the system every six months.

#### MX shunt trip

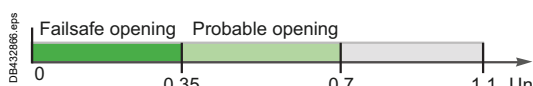
- Trips the circuit breaker when the control voltage rises above 70 % of its rated voltage ( $U_n$ ).
- Impulse type  $\geq 20$  ms or maintained control signals.
- Shunt trip 110...130 V AC is suitable for ground-fault protection when combined with a Class I ground-fault sensing element.
- Continuous duty rated coil <sup>(1)</sup>.



Opening conditions of the MX release.

#### MN undervoltage release

- Trips the circuit breaker when the control voltage drops below 35 % of its rated voltage.
- Between 35 % and 70 % of the rated voltage opening is only probable.
- Above 70 % of the rated voltage, opening does not take place.
- Continuous duty rated coil.
- Circuit breaker closing is possible only if the voltage exceeds 85 % of the rated voltage. If an undervoltage condition exists, operation of the closing mechanism of the circuit breaker will not permit the main contacts to touch, even momentarily. This is commonly called "Kiss Free".



Opening conditions of the MN release.



Closing conditions of the MN release.

### Installation, connection

Accessories snap into cavities under the circuit breaker front accessory cover. Spring-type terminals in order to insure a fast and reliable connection to 0.5...1.5 mm<sup>2</sup> flexible copper wire (one per terminal).

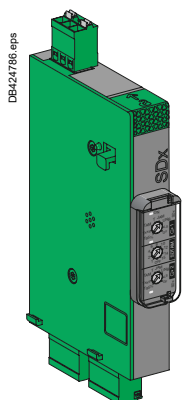
### Operation

Circuit breaker must be locally reset after trip by shunt trip (MX) or undervoltage release (MN). Tripping by MX or MN has priority over manual closing; in the presence of a standing trip order such an action does not result in main contacts closing, even temporarily.

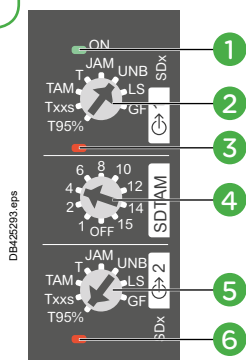
Description	Maximum number	Mounting	Voltage	Reference
MX Shunt trip	1	Internal, plug-in	24 V~ 50/60 Hz, 24 V---	GV4AS027
			48 V~ 50/60 Hz, 48 V---	GV4AS057
			110-130 V~ 50/60 Hz 125 V---	GV4AS137
			220-240 V~ 50 Hz, 208-240 V~ 60 Hz, 277 V 60 Hz	GV4AS287
			380-415 V~ 50 Hz, 440-480 V~ 60 Hz	GV4AS487
MN undervoltage release	1	Internal, plug-in	24 V~ 50/60 Hz, 24 V---	GV4AU027
			48 V~ 50/60 Hz, 48 V---	GV4AU057
			110-130 V~ 50/60 Hz 125 V---	GV4AU137
			220-240 V~ 50 Hz, 208-240 V~ 60 Hz	GV4AU247
			277 V~ 60 hZ	GV4AU286
			380-415 V~ 50 Hz	GV4AU415
			440-480 V~ 60 Hz	GV4AU486

<sup>(1)</sup> Except for MX 24 V AC/DC (in case of continuous activation, may generate some minor perturbation in sensitive environment).





GV4ADM1111 SDx contact module



- 1 Green led lighted when the module is powered.
- 2 Output 1: SD status assignment.
- 3 Red led lighted when output 1 is activated.
- 4 Cooling time setting before automatic restart (OFF – 1...15 min).
- 5 Output 2: SD status assignment.
- 6 Red led lighted when output 2 is activated.

## SDx contact module for GV4PEM, GV4PB (Multifunction)

The SDx provides alarming and functional fault differentiation for GV4PEM, GV4PB (Multifunction) circuit breaker. This module has 2 NO/NC outputs dry contacts which can be assigned with one of the 8 following SD status:

- **SDT95%** overload alarm: thermal image of the motor is greater than 95 % of the permissible temperature rise.
- **SDTxxs** overload alarm: circuit breaker will trip in xx seconds with the same load. xx is adjustable between 10 to 40 seconds (default 20 seconds) on the circuit breaker itself through NFC or a computer with EcoStruxure Power Commission software and an interface module (TRV00911).
- **SDTAM** overload alarm just before tripping: in the event of a phase unbalance, overload, or on a jam fault, this output is activated to open the contactor and avoid circuit breaker tripping. In that case, contact can be manually or automatically reseted after an adjustable cooling time from 1 to 15 minutes. If after a 400 ms delay the motor is not stopped, the circuit breaker will trip.
- **SDT** overload trip indication: circuit breaker has tripped due to an overload fault
- **SDJAM** jam trip indication: circuit breaker has tripped due to a jam fault
- **SDUNB** phase unbalance trip indication: circuit breaker has tripped due to an unbalance fault
- **SDLS** long start trip indication: circuit breaker has tripped due to a long start fault
- **SDGF** ground-fault trip indication: circuit breaker has tripped due to a ground-fault.

Outputs are automatically reseted either when alarm disappears or when the circuit breaker is restarted.

## Output characteristics

- 2 NO/NC dry contacts
- 24...250 V AC/DC
- Minimum load: 2 mA under 24 V DC
- Max load: 5 A
- AC15 (230 V max - 400 VA)
- DC13 (24 V - 50 W)

## Power characteristics

- 24...240 V AC/DC

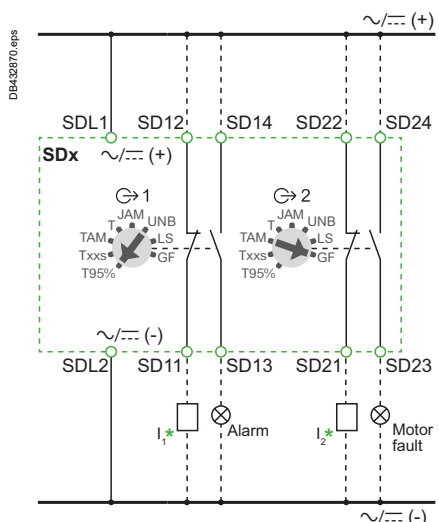
## Contact rating (per UL/CSA B300 &amp; R300)

Standard	Rated Voltage Ue	Operational Current Ie	Make VA	Break VA	Ithe A
B300	120 V AC	3	3600	360	5
	240 V AC	1.5			
R300	125 V DC	0.22	28	28	1
	250 V DC	0.1			

The rated operational current  $I_e$  (A), the rated operational voltage  $U_e$  (V) and the break apparent power  $B$  (V.A) are correlated by the formula  $B = U_e \cdot I_e$ ; with  $I_e \leq I_{the}$ .

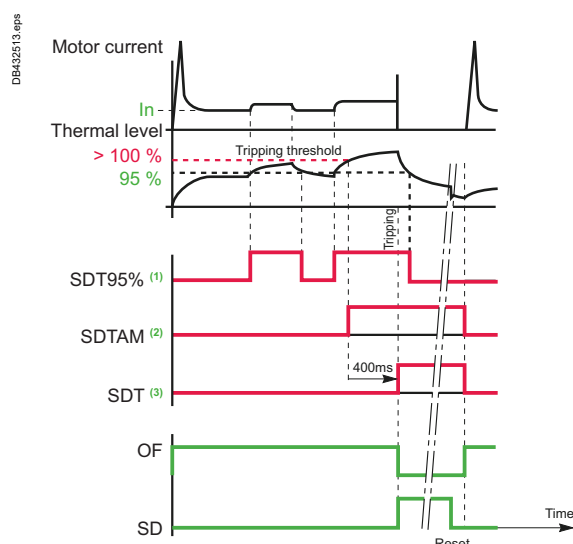
## Installation, connection, settings and indication

The SDx module is clipped on the right side of the circuit breaker. Each removable spring terminal can be connected by one 0.5... 1.5 mm<sup>2</sup> copper wire. Settings and indications are available on the front face.



\* I1, I2: PLC digital inputs - used as alarm inputs, as an example.

SDx wiring diagram

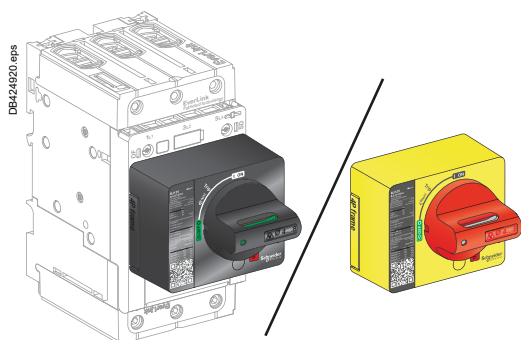


GV4PEM curves  
SDx modules curves  
Aux. contacts curves

- (1) SDT95% (= 95% overload)
- (2) SDTAM (overload tripping pre alarm) here not connected to any contactor coil
- (3) SDT (= tripping on thermal fault)

Description	Mounting	Maximum number	Type of contacts	Unit reference
SDx: alarming / fault differentiation module	Side	2	N/O / N/C	GV4ADM1111

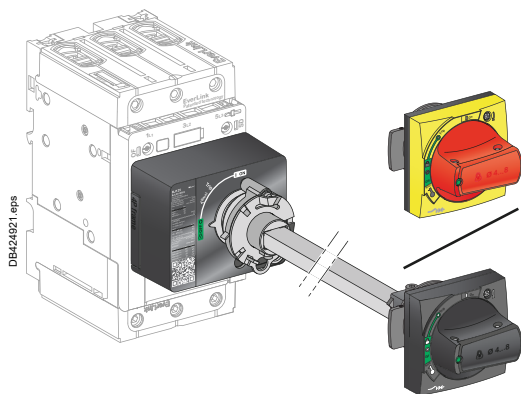




Direct mounting rotary handle



GV4ADN02 direct mounting rotary handle



Front extended rotary handle (door-mounting)



GV4APN01 front extended rotary handle kit



GVAPL01 laser tool

Dimensions:  
pages B6/126 to B6/128

## Direct mounting rotary handles

### Installation

The direct mounting rotary handle has to be mounted by 3 screws on the front accessory cover.

### Operation

The direct mounting rotary handle maintains:

- suitability for isolation
- indication of the three positions OFF (O), ON (I) and tripped (Trip)
- access to the "push-to-trip" button
- visibility and access to the trip unit.

### Device padlocking

The circuit breaker may be locked in the OFF position by using one to three padlocks (not supplied) or in ON position after customer modification of the rotary handle before installation, padlock shackle Ø4-8 mm. Locking in the ON position does not prevent the circuit breaker from tripping if a circuit or motor malfunction occurs. In this case, the handle remains in the ON position after the circuit breaker trips. Unlocking is required for the handle to go to the tripped then the OFF position.

### Variations: door locking

Door locking built-in functionality can be activated by the customer to prevent opening the door when the circuit breaker is ON or in trip position. For exceptional situations, door locking can be temporarily disabled with a tool by qualified personnel to open the door when the circuit breaker is closed.

Description	Type	Degree of protection	Reference
Direct mounting rotary handle	Black handle	IP40	GV4ADN01
	Red handle on yellow bezel (VDE standard, for machine control)	IP40	GV4ADN02

## Front extended rotary handles

### Installation

The door-mounted (extended) rotary handle is made up of:

- a unit that has to be screwed on the front accessory cover of the circuit breaker
- an assembly (handle mechanism and front plate) on the door that is always secured in the same position, whether the circuit breaker is installed vertically or horizontally
- an adjustable extension shaft.

The handle mechanism is fixed with a nut (Ø22 mm) to make assembly easier. The Laser Square tool (GVAPL01) can be used to accurately align the hole on the door with the circuit breaker.

### Operation when door is closed

The door mounted handle makes it possible to operate a circuit breaker installed in an enclosure from the front. The door mounted operating handle maintains:

- suitability for isolation
- indication of the three positions OFF (O), ON (I) and tripped (Trip)
- visibility and access to trip unit when the door is open
- degree of protection of the handle on the door: IP54 or IP65 as per IEC 60529.

### Mechanical door locking when device closed

A standard feature of the extended rotary handle is a locking function, built into the shaft, that disables door opening when the circuit breaker is in the ON or tripped positions.

Door locking can be temporarily disabled with a tool by qualified personnel to open the door without opening the circuit breaker. This operation is not possible if the handle is locked by a padlock.

### Device and door padlocking

Padlocking locks the circuit breaker handle and disables door opening:

- standard situation, in the OFF position, using 1 to 3 padlocks, shackle Ø4-8 mm, padlocks are not supplied
- for the black handle, with a voluntary modification of the door handle (to be done by the customer during installation), in the ON and OFF positions. Locking in the ON position does not prevent the circuit breaker from tripping if a circuit or motor malfunction occurs. In this case, the handle remains in the ON position after the circuit breaker trips. Unlocking is required for the handle to go to the tripped then the OFF position.

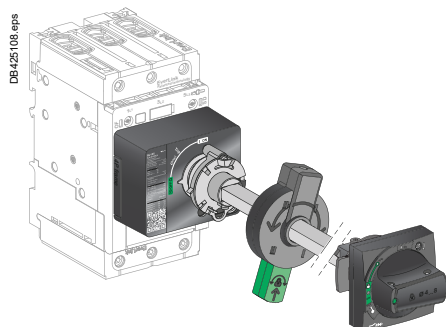
### Shaft length

The shaft length is the distance between the back of the circuit breaker and the door:

- minimum shaft length is 214 mm
- maximum shaft length is 627 mm
- shaft length must be adjusted.







Open door shaft operator mounted on front extended rotary handle assembly



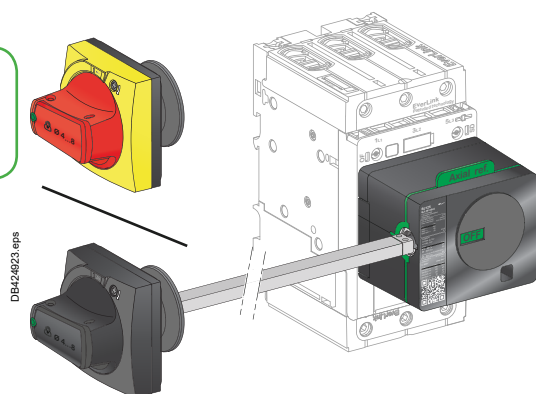
GV4APN01  
Front extended rotary handle kit



LV426937  
Open door shaft operator



GVAPL01 - Laser tool



Side extended rotary handle (cover mounting)



LV426936 - Side rotary handle kit



LV426998, LV426997 - Universal handles

## Front extended rotary handles (cont.)

### Operation when door is opened

An open door shaft operator can be used to operate the circuit breaker when door is opened. This accessory complies with UL508 A.

The indication of the three positions OFF (O), ON (I) and tripped (Trip) is visible on the circuit breaker.

The circuit breaker itself may be locked in OFF position when the door is opened by 1 padlock / lockout hasp, shackle Ø4-8 mm.

Description	Type	Degree of protection	Reference
Front extended rotary handle kit	Black handle	IP54	GV4APN01
	Red handle on yellow bezel	IP54	GV4APN02
		IP65	GV4APN04
Open door shaft operator			LV426937
Laser tool			GVAPL01
Spare part: GV4 universal handle (for replacement of front. ext. or side rotary handle)	Black handle	IP54	LV426997
	Red handle on yellow bezel	IP54	LV426998
		IP65	LV426999

## Side rotary handles (left or right)

### Installation

The side-mounted rotary handle is made up of:

- a unit that has to be screwed on the front accessory cover of the circuit breaker
- an assembly (handle and front plate) on the side (left or right) of the enclosure
- an adjustable extension shaft

The handle mechanism is fixed with a nut (Ø22 mm) to make assembly easier.

### Operation

The side mounted rotary handle makes it possible to operate circuit breakers installed in enclosure from the side. The side mounted rotary handle maintains:

- suitability for isolation
- indication of the three positions OFF (O), ON (I) and tripped (Trip). Moreover, the position is visible on the circuit breaker itself
- visibility and access to trip unit when the door is open
- degree of protection of the handle on the side: IP54 or IP65 as per IEC 529.

### Device padlocking

The circuit breaker may be locked in the OFF position, or, for the black rotary handle only, in ON position after voluntary modification of the side handle (to be done by the customer during installation), by using one to three padlocks, padlock shackle Ø4-8 mm ; padlocks are not supplied.

Locking in the ON position does not prevent free circuit breaker from tripping if a circuit or motor malfunction occurs. In this case, the handle remains in the ON position after the circuit breaker tripping. Unlocking is required to go to the tripped then the OFF position.

### Shaft length

The shaft length is the distance between the side of the circuit breaker and the side of the enclosure:

- minimum shaft length is 45 mm
- maximum shaft length is 480 mm
- shaft length must be adjusted.

Description	Type	Degree of protection	Reference
Side rotary handle kit	Black handle	IP54	LV426935
	Red handle on yellow bezel (VDE standard, for machine control)	IP54 <sup>(1)</sup>	LV426936
Spare part: GV4 universal handle (for replacement of front. ext. or side rotary handle)	Black handle	IP54	LV426997
	Red handle on yellow bezel	IP54	LV426998
		IP65	LV426999

<sup>(1)</sup> IP65 possible with LV426935 kit (Black handle not used) + LV426999 Red handle on yellow bezel universal handle.



### Handle padlocking devices

Padlocking systems can receive up to three padlocks with diameters of 5-8 mm (4-8 mm for rotary handles); padlocks not supplied. Locking in the OFF position guarantees isolation as per IEC 60947-2.

#### Direct rotary handle padlocking

By padlock – No accessory required.

- Lock in OFF position.
- Lock in ON position with simple mechanism modification.

#### Front Extended /Side rotary handle padlocking

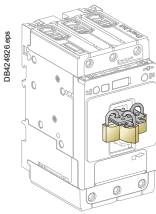
By padlock – No accessory required.

- Lock in OFF position.
  - Lock in ON position with simple mechanism modification (black handle only).
- Door opening prevented.

#### Toggle handle padlocking

By padlock – removable toggle locking device required **29370**.

- Lock in OFF position.



3 padlocks mounted on 29370 toggle locking device



PB121331.eps

29370 removable toggle locking device

Description	Reference
Removable toggle locking device for 1 to 3 padlocks	<b>29370</b>

### Sealing devices

Control type	■ Front removal. ■ Access to auxiliaries.	■ Access to settings and test connector.
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Toggle	 DB424927.eps	 DB424928.eps
Rotary handle	 DB424929.eps	 DB424930.eps

Description	Reference
Bag of 6 leads + 6 sealing accessories	<b>LV429375</b>



PB121332.eps

LV429375 leads + sealing accessories



# TeSys

## TeSys GV4 circuit breakers - Accessories

### Product references



**LAD96595**  
EverLink connector



**GV4LUG**  
crimped lug connector



**LV426920**  
interphase barriers



**LV426990**  
9 N.m green throwaway bits



**LAD96590**  
transparent terminal shield



**LV426940**  
spreader 3-pole



**LV426992**  
5 N.m yellow throwaway bits



**LV434206**  
pocket battery



**TRV00910**  
maintenance case



**TRV00911**  
Spare USB maintenance interface



**TRV00915**  
spare power supply  
110-240 V AC



**TRV00917**  
spare GV4PEM cord for  
USB maintenance interface

#### EverLink power connection

Description	Reference
EverLink connector	<b>LAD96595</b>

#### Crimp lug/busbar connection

Description	Sold in lots of	Reference
Crimped lug connector + screws	1	<b>GV4LUG</b>
Transparent terminal shield for crimped lug connector	1	<b>LAD96590</b>
Interphase barriers	6	<b>LV426920</b>
Spreader 3-pole	To increase the pitch to 35 mm	<b>LV426940</b>

#### Limited torque throwaway bits

Description	Sold in lots of	Reference
Green - 9 N.m	6	<b>LV426990</b>
Yellow - 5 N.m	6	<b>LV426992</b>

**Note:** torque limiting breakaway bits may be used, particularly in the field, to tighten at the right torque EverLink™ or compression lug power connections.

#### Test tool, software, demo for GV4PEM

##### Test tool

Pocket battery	<b>LV434206</b>
Allows the GV4PEM or GV4PB controller to be powered for adjustments and tests when no internal source is available.	

Maintenance case	<b>TRV00910</b>
Comprising:	

- USB maintenance interface
- Power supply
- GV4PEM cord
- USB cord
- RJ45/RJ45 male cord

Spare USB maintenance interface	<b>TRV00911</b>
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USB interface spare power supply, 110-240 V AC, with 4 different socket adapters	<b>TRV00915</b>
--	-----------------

Spare cord for connecting GV4PEM to USB maintenance interface	<b>TRV00917</b>
---	-----------------

##### Software

Configuration and setting software EcoStruxure Power Commission	<b>Free download</b>
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# TeSys GV5/GV6

55 to 250 kW



Circuit  
breakers



Circuit  
breakers

B6/50

Life | s On

**Schneider**  
Electric



# TeSys

## TeSys GV5P, GV6P Thermal-magnetic circuit breakers

### Product references



GV5P220F

#### Thermal-magnetic circuit breakers GV5P with screw clamp terminals up to 110 kW <sup>(1)</sup>

Control by direct rotary handle										Thermal setting range (Ir)	Reference	Weight
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3												
400/415 V			500 V			660/690 V						
P	Icu	Ics <sup>(2)</sup>	P	Icu	Ics <sup>(2)</sup>	P	Icu	Ics <sup>(2)</sup>	A			kg
kW	kA	%	kW	kA	%	kW	kA	%				
55...75	36	100	75...90	30	100	90... 110	8	100	70...150	GV5P150F	2.4	
	70	100		50	100		10	100		GV5P150H		
90...110	36	100	110	30	100	110...132	8	100	100...220	GV5P220F	2.6	
	70	100		50	100		10	100		GV5P220H		

<sup>(1)</sup> Breakers have to be used with suitable rating of contactors, as defined in section A6.

<sup>(2)</sup> As % of Icu.



GV6P320F

#### Thermal-magnetic circuit breakers GV6P with screw clamp terminals up to 250 kW <sup>(1)</sup>

Control by direct rotary handle										Thermal setting range (Ir)	Reference	Weight
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3												
400/415 V			500 V			660/690 V						
P	Icu	Ics <sup>(2)</sup>	P	Icu	Ics <sup>(2)</sup>	P	Icu	Ics <sup>(2)</sup>	A			kg
kW	kA	%	kW	kA	%	kW	kA	%				
132...160	36	100	160...200	25	100	200...250	10	100	160...320	GV6P320F	6.5	
	70	100		50	100		10	100		GV6P320H		
200...250	36	100	250...315	25	100	315...400	10	100	250...500	GV6P500F	6.7	
	70	100		50	100		10	100		GV6P500H		

<sup>(1)</sup> Breakers have to be used with suitable rating of contactors, as defined in section A6.

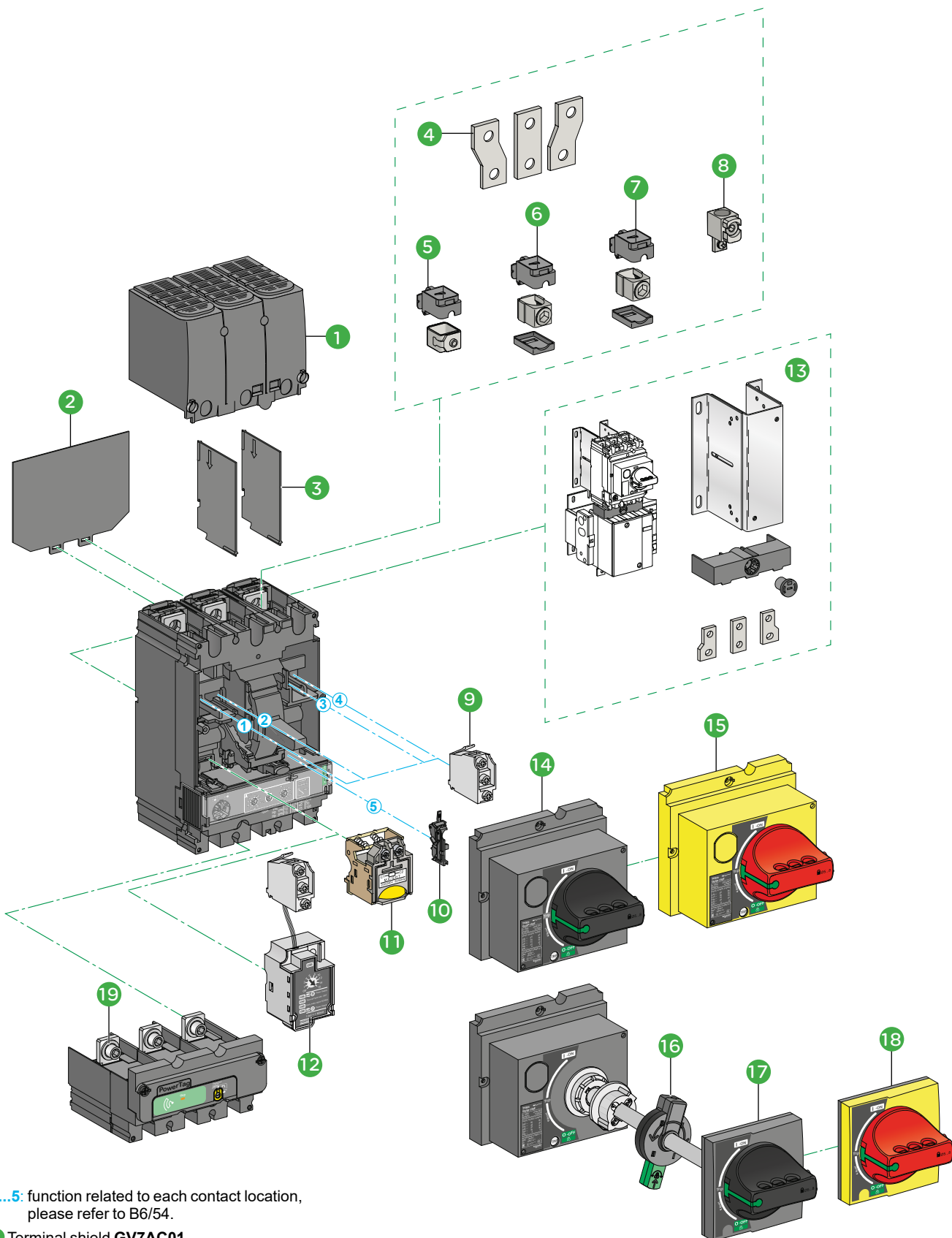
<sup>(2)</sup> As % of Icu.

#### Thermal-magnetic circuit breakers GV5P/GV6P with screw clamp terminals <sup>(1)</sup>

Control by direct rotary handle					
Thermal setting	3-Phase			Standard breaking capacity	High breaking capacity
	230 V	460 V	575 V		
A	HP	HP	HP	Reference	Reference
90...150	50	100	150	GV5P150F	GV5P150H
133...220	75	150	200	GV5P220F	GV5P220H
160...320	125	250	300	GV6P320F	GV6P320H
250...500	150	350	500	GV6P500F	GV6P500H

<sup>(1)</sup> Breakers have to be used with suitable rating of contactors, as defined in section A6.



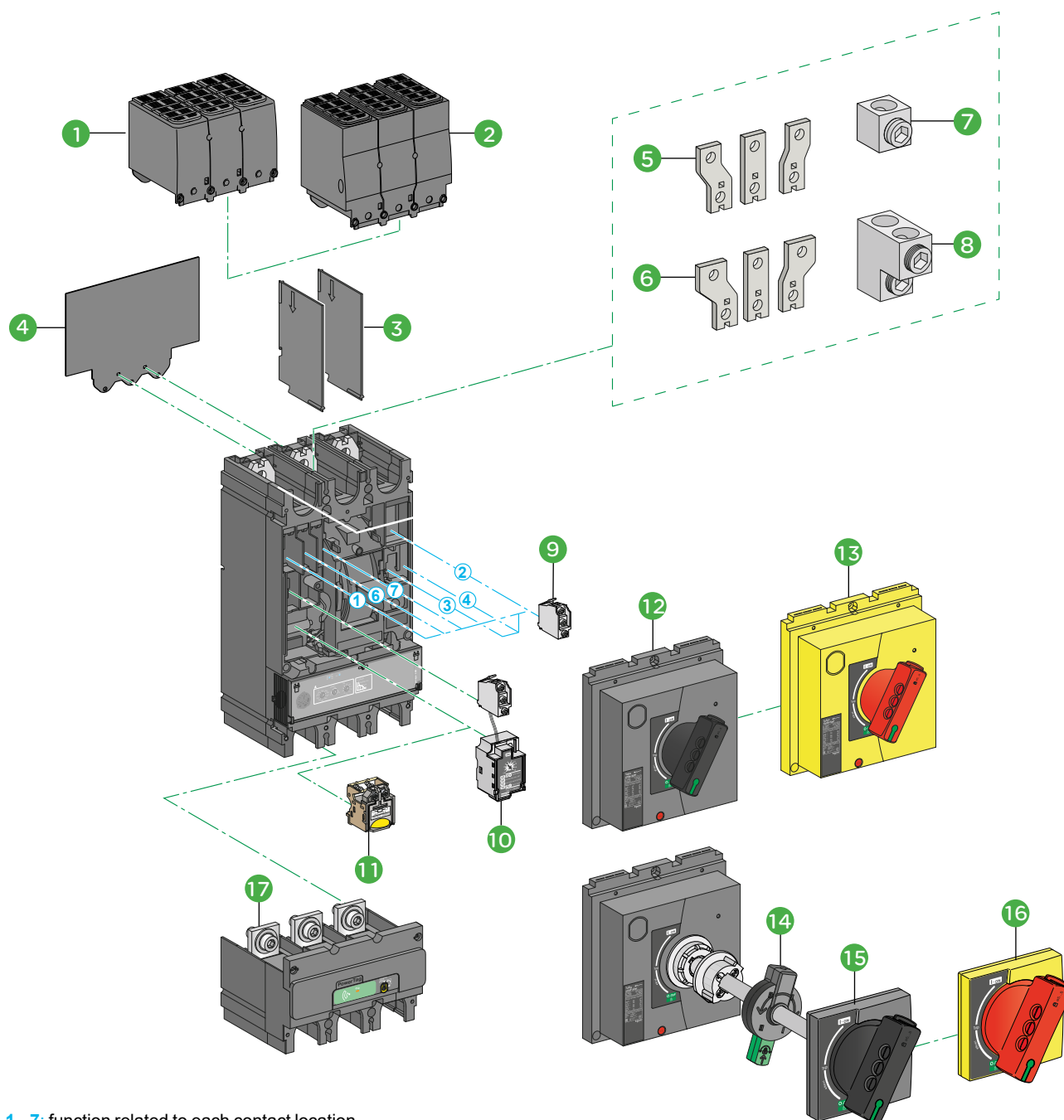


1...5: function related to each contact location, please refer to B6/54.

- ① Terminal shield **GV7AC01**
- ② Insulating screen **GV7AC05**
- ③ Interphase barriers **GV7AC04**
- ④ Spreaders 45 mm **GV7AC03**
- ⑤ Steel connector **GV7AC021** (1.5-95 mm<sup>2</sup>)
- ⑥ Aluminum connector **LV429227** (25-95 mm<sup>2</sup>)
- ⑦ Aluminum connector **GV7AC022** (120-185 mm<sup>2</sup>)
- ⑧ Aluminum connector **LV429244** (120-240 mm<sup>2</sup>)
- ⑨ OF, SD, or SDE indication contacts **GV7AE11** (standard) / **GV7AB11** (for low level)
- ⑩ SDE adapter **LV429451**
- ⑪ AU (UVR) or AS (SHT) voltage release **GV7AU.../ GV7AS...**
- ⑫ SDTAM thermal fault module **LV429424**
- ⑬ Combination kit for contactor **GV7AC06/GV7AC07/GV7AC08**

- ⑭ Direct rotary handle black **GV5AP03** (shipped with the device)
- ⑮ Direct rotary handle red on yellow bezel **GV7AP04**
- ⑯ Open door shaft operator **LV426937**
- ⑰ Extended rotary handle black **GV7AP01**
- ⑱ Extended rotary handle red on yellow bezel **GV7AP02**
- ⑲ PowerTag M250 wireless energy sensor **LV434020**





1...7: function related to each contact location, please refer to B6/54.

- ① Terminal shield 45 mm **LV432593**
- ② Terminal shield 52.5 mm **LV432595**
- ③ Interphase barriers **LV432570**
- ④ Insulating screen **LV432578**
- ⑤ Spreader 52.5 mm **LV432490**
- ⑥ Spreader 70 mm **LV432492**
- ⑦ Aluminum connector **LV432479** (1 x 35-300 mm<sup>2</sup>)
- ⑧ Aluminum connector **LV432481** (2 x 35-300 mm<sup>2</sup>)
- ⑨ OF, SD, or SDE indication contacts **GV7AE11** (standard) / **GV7AB11** (for low level)
- ⑩ SDTAM thermal fault module **LV429424**
- ⑪ AU (UVR) or AS (SHT) voltage releases **GV7AU●●●** / **GV7AUS●●●**
- ⑫ Direct rotary handle black **GV6AP03** (shipped with the device)
- ⑬ Direct rotary handle red on yellow bezel **LV432599**
- ⑭ Open door shaft operator **LV426937**
- ⑮ Extended rotary handle black **LV432598**
- ⑯ Extended rotary handle red on yellow bezel **LV432600**
- ⑰ PowerTag M630 wireless energy sensor **LV434022**



## Add-on auxiliary contacts - OF contacts

These allow remote indication of the circuit breaker contact states. They can be used for signalling, electrical locking, relaying, etc. They are available in two versions: standard and low level. They include a terminal block and the auxiliary circuits leave the circuit breaker through a hole provided for this purpose.

They perform the following functions, depending on where they are located in the circuit breaker:

Location	Function	Application
1 and/or 4 (GV5) 1 and/or 4, 6, 7 (GV6)	C/O contact	Indicates the position of the circuit breaker poles.
2	Trip indication	Indicates that the circuit breaker has tripped due to an overload, a short-circuit, a differential fault or the operation of a voltage trip (undervoltage or shunt trip), or of the "push to trip" test button. It resets when the circuit breaker is reset.
3	Electrical fault indication	Indicates that the circuit breaker has tripped due to an overload, a short-circuit or a differential fault. It resets when the circuit breaker is reset.
5	Adapter for electrical fault indication	This accessory is mandatory for GV5 to provide electrical fault indication.

Type	Reference
Standard	GV7AE11
Low level	GV7AB11
Adapter for electrical fault indication	LV429451

## Thermal fault module - SDTAM

GV5/ GV6 can be equipped with thermal fault module. This module have:

- a contact to indicate overload fault in the circuit-breaker
- a contact to open the contactor. In the event of overload or phase unbalance, this output is activated 400 ms before circuit-breaker tripping to open the contactor and avoid circuit breaker tripping.

Voltage	Reference
24...415 V AC/DC	LV429424 <sup>(1)</sup>

## Electric trips

These allow the circuit breaker to be tripped via an electrical control signal.

- Undervoltage release (UVR) - GV7AU
- Trips the circuit breaker when the control voltage drops below 35 % of its rated voltage.
- Between 35 % and 70 % of the rated voltage opening is possible but not guaranteed.
- Above 70 % of the rated voltage, opening does not take place.
- Continuous duty rated coil.
- Circuit breaker closing is possible only if the voltage exceeds 85 % of the rated voltage.
- Shunt trip (SHT) - GV7AS
- Trips the circuit breaker when the control voltage rises above 0.7 times the rated voltage.
- Impulse type  $\geq 20$  ms or maintained control signals.
- Operation (GV7AU or GV7AS)
- When the circuit breaker has been tripped by a GV7 AU or AS, it must be reset either locally.
- Tripping has priority over manual closing: if a tripping order is present, manual action does not result in closing, even temporarily, of the contacts.
- Durability: 50 % of the mechanical durability of the circuit breaker.

Type	Voltage	Reference
Undervoltage trip	48 V, 50/60 Hz	GV7AU055
	110...130 V, 50/60 Hz	GV7AU107
	200...240 V, 50/60 Hz	GV7AU207
	380...440 V, 50/60 Hz	GV7AU387
Shunt trip	48 V, 50/60 Hz	GV7AS055
	110...130 V, 50/60 Hz	GV7AS107
	200...240 V, 50/60 Hz	GV7AS207
	380...440 V, 50/60 Hz	GV7AS387

<sup>(1)</sup> LV429429 takes the place of the AU/AS electric trip coil and an auxiliary contact (C/O contact 1).







PB120641.eps

LV432479



PB120642.eps

LV432490



PB120643.eps

LV432593



PB120644.eps

GV7AC04



PB120640.eps

GV6AP03



PB120645.eps

LV432599



PB120646.eps

GV7AP02

### Cabling accessories

**Cable connectors:** The connectors for GV5 snap directly on to the device terminals or are secured by clips to right-angle and straight terminal extensions as well as spreaders. GV6 connectors are screwed directly to the device terminals.

**Spreaders:** Spreaders may be used to increase the pitch from 35 mm to 45 mm for GV5. The 45 mm pitch can be increased to 52.5 or 70 mm for GV6.

**Long terminal shields:** They are used for front connection with cables or insulated bars. They comprise two parts assembled with captive screws, forming an IP40 cover. The top part is equipped with sliding grids with break marks for precise adaptation to cables or insulated bars. The rear part completely blocks off the connection zone. Partially cut squares can be removed to adapt to all types of connection for cables with lugs or copper bars. Long terminal shields may be mounted upstream and downstream of the breaker.

**Phase barriers:** These interphase barriers are used for maximum insulation at the power-connection points.

**Insulating screens:** These are fitted at the rear of the device which provides insulation. Their use is mandatory for devices with spreaders, installed on backplates, when terminal shields are not used.

**GV5 Combination kits:** These kits allow link between the circuit breaker and the contactor. The cover provides protection against direct finger contact. The kit comprises links, a protective shield and a depth adjustable metal bracket for the breaker.

Description	Application	Sold in lots of	Unit reference GV5	Unit reference GV6
<b>Steel connectors (set of 3)</b>	1.5...95 mm <sup>2</sup> ≤ 150 A	1	GV7AC021	—
<b>Aluminium connectors (set of 3)</b>	25...95 mm <sup>2</sup> ≤ 220 A	1	LV429227	
	120...185 mm <sup>2</sup> ≤ 220 A	1	GV7AC022	
	120...240 mm <sup>2</sup> ≤ 220 A	1	LV429244	
	35...300 mm <sup>2</sup>	1		LV432479
<b>Spreader 3-pole <sup>(1)</sup></b>	2 x 35...300 mm <sup>2</sup>	1		LV432481
	35...45 mm pole pitch	1	GV7AC03	
	52.5 mm pole pitch	1		LV432490
<b>Long terminal shield (IP40) <sup>(1)</sup></b>	70 mm pole pitch	1		LV432492
	35 mm pole pitch	1	GV7AC01	
	45 mm pole pitch	1		LV432593
<b>Phase barriers (set of 6)</b>	52.5 mm pole pitch	1		LV432595
		1	GV7AC04	LV432570
<b>Insulating screens (set of 2)</b>	45 mm	1	GV7AC05	
	70 mm			LV432578
<b>Combination Kits <sup>(2)</sup></b>				
<b>For contactor LC1 F115...F185</b>	Connection kits between breaker and contactor	1	GV7AC06	
<b>For contactor LC1 F225 and F265</b>		1	GV7AC07	
<b>For contactor LC1 D115 and D150</b>		1	GV7AC08	

### Direct rotary handle

The circuit breaker is always supplied direct rotary handle (black handle, black plate) as standard and it provides IP40 protection. The other type handles can be used by replacing this direct rotary handle. It includes a device for locking the circuit breaker in the O (Off) position by means of up to 3 padlocks with a shackle diameter of 5 to 8 mm (padlocks not included). A MCC conversion accessory allows the direct rotary handle to be mounted on the enclosure door. In this case, the door cannot be opened if the circuit breaker is in the "ON" position. Circuit breaker closing is inhibited if the enclosure door is open and prevents the device from being closed if the door is open.

Description	Type	Sold in lots of	Unit reference GV5	Unit reference GV6
<b>Direct rotary handle</b>	Black handle, black legend plate	1	GV5AP03	GV6AP03
	Red handle, yellow legend plate	1	GV7AP04	LV432599
<b>MCC conversion accessory</b>	Four mounting direct rotary handle on enclosure door	1	GV7AP05	LV432606

### Extended rotary handle

Allows to operate a circuit breaker from the front of the switch board, which's installed in the back of an enclosure, which provides IP55 protection. It comprises:

- a unit which is screwed onto the front accessory cover of the circuit breaker,
- an assembly (handle mechanism and front plate) to be fitted on the enclosure door,
- an extension shaft which must be adjusted.
- The distance minimum and maximum distances between the mounting surface and the door are
  - 185...600 mm for GV5
  - 209...600 mm for GV6

It includes a device for locking the circuit breaker in the O (Off) position by means of up to 3 padlocks with a shackle diameter of 5 to 8 mm (padlocks not included) and disables opening enclosure door.

Description	Type	Sold in lots of	Unit reference GV5	Unit reference GV6
<b>Extended rotary handle</b>	Black handle, black legend plate	1	GV7AP01	LV432598
	Red handle, yellow legend plate	1	GV7AP02	LV432600

<sup>(1)</sup> Terminal shields cannot be used together with spreaders.

<sup>(2)</sup> The kit comprises links, a protective shield and a depth adjustable metal bracket for the breaker.





LV426937  
Open door shaft operator



GVAPL01 Laser tool



LVA429375  
Sealing accessories

#### Front extended rotary handles (cont.)

##### Operation when door is opened

An open door shaft operator can be used to operate the circuit breaker when door is opened. This accessory complies with UL508 A.

The indication of the three positions OFF (O), ON (I) and tripped (Trip) is visible on the circuit breaker.

The circuit breaker itself may be locked in OFF position when the door is opened by 1 padlock / lockout hasp, shackle Ø4-8 mm.

Description	Reference
Open door shaft operator	LV426937
Laser tool	GVAPL01

#### Other accessories

Bag of 6 tamper seals + 6 cover caps (1 large, 5 small) for screw heads	LV429375
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#### PowerTag Measurement module

##### Wireless-communication module

PowerTag is directly mounted on the bottom side of the circuit breaker.

It provides capability to measure energy, monitor voltage loss, and trigger alarms.

It then delivers useful data to a concentrator for monitoring and diagnosis of the associated circuit breaker.

In addition to monitoring and alarming, PowerTag solution provides a complete knowledge of real time electrical values with a rich and accurate data transfer every 5 seconds.

PowerTag energy sensors can be quickly and easily installed in new or existing panels at any time. Compared to traditional metering solutions, installation time and commissioning are much shorter with no wiring, hence an error proof high density solution and a built-in class 1 accuracy.

##### Functions

PowerTag energy sensor measures the following values in accordance with the IEC 61557-12 standard:

- Energy (4 quadrants):
  - ☐ Active energy (Wh): total and partial, delivered and received
  - ☐ Active energy per phase (Wh): total
  - ☐ Reactive energy (VARh): partial, delivered and received
- Power:
  - ☐ Active power (W): total and per phase
  - ☐ Reactive power (VAR): total
  - ☐ Apparent power (VA): total
- Voltages (V): phase-to-phase (U12, U23, U31) and phase-to-neutral (V1N, V2N, V3N)
- Currents (A): per phase (I1, I2, I3)
- Frequency
- Power factor
- Voltage loss alarm:
  - ☐ PowerTag energy sensor sends a "voltage loss" alarm and the current-per-phase value before being de-energized
  - ☐ At "voltage loss", PowerTag adds an overload alarm if the current is higher than the rated current of the associated protective device.

**Note:** functions listed above depend on concentrators/gateways.

Description	Reference
PowerTag M250 3P: suitable for GV5 up to 220 A	LV434020
PowerTag M630 3P: suitable for GV6 up to 500 A	LV434022



# TeSys GB2

0.5 to 20 A

(for equipment and control circuits)



Circuit  
breakers





GB2CB

GB2CD



GB2DB

GB2CS

### Introduction

GB2 thermal-magnetic circuit breakers protect and isolate the control circuits of industrial equipment with contactor coils, transformers....

They protect and isolate single-phase auxiliary circuits such as solenoid valves, electro-brakes, battery chargers, supplied from the control circuit voltage.

### GB2CB, GB2CD, GB2DB

12 ratings are available, from 0.5 to 20 A, in single-pole (GB2CB), single-pole + neutral (GB2CD) and 2-pole (GB2DB) versions.

They have a magnetic tripping threshold set at between 12 and 16 In to withstand the current peaks generated by many industrial components.

### GB2CS

2 ratings are available, 0.5 and 1 A, in single-pole version.

The magnetic tripping threshold is set between 5 and 7 In.

### Functions, installation

Clip-on fixing onto all types of 35 mm  $\perp$  rails, on  $\perp$  rails and on Telequick mounting plates.

Upstream and downstream marking by means of AB1 clip-in markers.

Clear indication of "I" and "O" positions on the operator.

Tamper-proof device which requires no special maintenance (fixed magnetic and thermal tripping thresholds).

### Selection for the protection of circuits supplied by transformers

Single-phase transformers.

Magnetising peak: 20 In.

Operation of magnetic trips: 13 In.

Power VA	Primary <sup>(1)</sup>		Secondary			
	220/240 V	380/415 V	24 V	48 V	110 V	220 V
40	GB2DB05	GB2DB05	GB2CD07	GB2CD06	GB2CD05	GB2CD05
63	GB2DB05	GB2DB05	GB2CD08	GB2CD07	GB2CD06	GB2CD05
100	GB2DB06	GB2DB05	GB2CD10	GB2CD07	GB2CD06	GB2CD05
160	GB2DB07	GB2DB06	GB2CD14	GB2CD09	GB2CD07	GB2CD06
250	GB2DB07	GB2DB06	GB2CD16	GB2CD12	GB2CD08	GB2CD07
400	GB2DB08	GB2DB07	GB2CD22	GB2CD14	GB2CD09	GB2CD07
630	GB2DB10	GB2DB08	—	GB2CD21	GB2CD12	GB2CD08
1000	GB2DB14	GB2DB09	—	—	GB2CD16	GB2CD10
1600	GB2DB20	GB2DB14	—	—	—	GB2CD14
2000	GB2DB21	GB2DB14	—	—	GB2CD22	GB2CD16
2500	GB2DB22	GB2DB20	—	—	—	GB2CD20
3000	GB2DB22	GB2DB20	—	—	—	GB2CD21
4000	—	GB2DB21	—	—	—	GB2CD22
5000	—	GB2DB22	—	—	—	—

<sup>(1)</sup> If the breaking capacity of the **GB2** is insufficient, use a **GV2RT** with 2 poles connected in series.



PB110899\_20.eps



GB2CB●●

PB110901\_20.eps



GB2CD●●

PB110902\_20.eps



GB2DB●●

#### Circuit breakers with magnetic tripping threshold: 12 to 16 In

##### Single-pole

Conventional rated thermal current I <sub>th</sub> <sup>(1)</sup>	Magnetic tripping current I <sub>d</sub> ± 20 %	Sold in lots of	Unit reference
A	A		
0.5	6.6	6	GB2CB05
1	14	6	GB2CB06
2	26	6	GB2CB07
3	40	6	GB2CB08
4	52	6	GB2CB09
5	66	6	GB2CB10
6	83	6	GB2CB12
8	108	6	GB2CB14
10	138	6	GB2CB16
12	165	6	GB2CB20
16	220	6	GB2CB21
20	270	6	GB2CB22

##### Single-pole + neutral

Conventional rated thermal current I <sub>th</sub> <sup>(1)</sup>	Magnetic tripping current I <sub>d</sub> ± 20 %	Sold in lots of	Unit reference
A	A		
0.5	6.6	6	GB2CD05
1	14	6	GB2CD06
2	26	6	GB2CD07
3	40	6	GB2CD08
4	52	6	GB2CD09
5	66	6	GB2CD10
6	83	6	GB2CD12
8	108	6	GB2CD14
10	138	6	GB2CD16
12	165	6	GB2CD20
16	220	6	GB2CD21
20	270	6	GB2CD22

##### 2-pole

Conventional rated thermal current I <sub>th</sub> <sup>(1)</sup>	Magnetic tripping current I <sub>d</sub> ± 20 %	Sold in lots of	Unit reference
A	A		
0.5	6.6	3	GB2DB05
1	14	3	GB2DB06
2	26	3	GB2DB07
3	40	3	GB2DB08
4	50	3	GB2DB09
5	66	3	GB2DB10
6	83	3	GB2DB12
8	108	3	GB2DB14
10	138	3	GB2DB16
12	165	3	GB2DB20
16	220	3	GB2DB21
20	270	3	GB2DB22

<sup>(1)</sup> Conforming to IEC 60947-1.



Circuit  
breakers



TeSys

TeSys GB Thermal-magnetic circuit breakers for auxiliary circuits

Product references

Circuit breakers with magnetic tripping threshold: 5 to 7 In



GB2CS●●

Single-pole			
Conventional rated thermal current Ith <sup>(1)</sup>	Magnetic tripping current Id ± 20 %	Sold in lots of	Unit reference
A	A		
0.5	3.3	6	GB2CS05
1	6	6	GB2CS06

(1) Conforming to IEC 60947-1.

Accessories for circuit breakers GB2-CB, DB and CS



GB2G210

Description	Sold in lots of	Unit reference
Busbar set for supply to 10 GB2 DB or 20 GB2CB or GB2CS with 2 connectors	1	GB2G210
Supply connector	10	GB2G01



GB2G01



## Technical Data for Designers

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Circuit  
breakers



# TeSys GV2

0.06 to 15 kW



Circuit  
breakers



# TeSys

## TeSys GV2 Motor circuit breakers

### Characteristics

Environment								
Circuit breaker type				GV2L	GV2LE	GV2ME	GV2P	GV2RT
Conforming to standards				IEC/EN 60947-4-1, IEC/EN 60947-2				
				CSA C22.2 n°60947-4-1 <sup>(1)</sup>				
Product certifications				CCC, EAC, BV, LROS, DNV-GL, RINA, UL <sup>(1)</sup>	CCC, EAC, BV, RINA, UL <sup>(1)</sup>	CCC, UL, CSA, EAC, ATEX, BV, LROS, DNV-GL, RINA	CCC, UL, CSA, EAC, BV, LROS, DNV-GL, RINA	CCC, UL, CSA, EAC, BV, LROS
Climatic withstand				According to IACS E10				
Degree of protection (front face)	Conforming to IEC 60529	Open mounted In enclosure		Against direct finger contact: IP20				
				IP65 with GV2PC01 enclosure	-	IP41 with GV2M●01 IP55 with GV2M●02 enclosure	IP 65 with GV2PC01 enclosure	-
Shock resistance	Conforming to IEC 60068-2-27			30 gn - 11 ms				
Vibration resistance	Conforming to IEC 60068-2-6			5 gn (5 to 150 Hz)				
Ambient air temperature	Storage		°C	-40...+80				
	Operation	Open mounted	°C	-20...+60				
		In enclosure	°C	-20...+40				
Temperature compensation		Open mounted	°C	-20...+60				
		In enclosure	°C	-20...+40				
Flame resistance	Conforming to IEC 60695-2-11		°C	960				
Maximum operating altitude			m	2000				
Suitable for isolation	Conforming to IEC 60947-1 § 7-1-6			Yes				
Resistance to mechanical impact			J	0.5				
				IK04				
Sensitivty to phase failure				Yes, conforming to IEC 60947-4-1 § 8-2-1-5-2 for GV2ME & GV2P				
Technical characteristics								
Circuit breaker type				GV2L	GV2LE	GV2ME	GV2P	GV2RT
Utilisation category	Conforming to IEC 60947-2			A				
	Conforming to IEC 60947-4-1			AC-3				
Rated operational voltage (Ue)	Conforming to IEC 60947-2		V	690				
Rated insulation voltage (Ui)	Conforming to IEC 60947-2		V	690				
Rated voltage	Conforming to UL 60947-4-1		V	-	-	600	600	600
	CSA C 22.2 n° 60947-4-1			480	480	600	600	600
Rated operational frequency	Conforming to IEC 60947-4-1 UL, CSA		Hz	50/60				
Rated impulse withstand voltage (U imp)	Conforming to IEC 60947-2		kV	6				
Total power dissipated per pole			W	1.8		2.5		
Mechanical durability (C.O.: Closing, Opening)			C.O.	100 000				
Electrical durability for AC-3/415V duty (C.O.: Closing, Opening)	415 V In		C.O.	100 000				
Duty class (maximum operating rate)			C.O./h	40		25		
Maximum conventional rated thermal current (Ith)	Conforming to IEC 60947-4-1		A	0.4...32	0.4...32	0.16...32	0.16...32	0.40...23
Rated duty	Conforming to IEC 60947-4-1			Continuous duty				

(1) GV2L03 to GV2L22, GV2LE03 to GV2LE22.

(2) UL 60947-4-1 type E for GV2P●● (except 32 A).



# TeSys

## TeSys GV2 Motor circuit breakers

### Characteristics

Mounting characteristics			
Operating position Without derating, in relation to normal vertical mounting plane <sup>(1)</sup>		DF510620 eps	
Products side by side			
		Db432868 eps	
<p>When several products <b>GV2ME●●</b>, <b>GV2P●●</b>, <b>GV2RT●●</b> are mounted side by side, the thermal trip setting <math>I_r</math> maybe need to be adjusted up to 1.1x<math>I_n</math>.</p> <p>Do not exceed the maximum thermal setting <math>I_r</math>. E.g: <b>GV2ME14</b>, thermal setting range: 6...10, do not adjust <math>I_r</math> above 10 A.</p>			
Connection characteristics			
Connection to screw clamp terminals or spring terminals			
Bare cables		DF510554 eps	
Circuit breaker type			<b>GV2L</b> Min. Max. <b>GV2LE</b> Min. Max. <b>GV2ME</b> Min. Max. <b>GV2P</b> Min. Max. <b>GV2RT</b> Min. Max.
Connection to screw clamp terminals (Max. number of conductors x c.s.a.)	Solid cable	mm <sup>2</sup>	2 x 1 2 x 6 2 x 1 2 x 6 2 x 1 2 x 6 2 x 1 2 x 6 2 x 1 2 x 6
	Flexible cable without cable end	mm <sup>2</sup>	2 x 1.5 2 x 6 2 x 1.5 2 x 6 2 x 1.5 2 x 6 2 x 1.5 2 x 6 2 x 1.5 2 x 6
	Flexible cable with cable end	mm <sup>2</sup>	2 x 1 2 x 4 2 x 1 2 x 4 2 x 1 2 x 4 2 x 1 2 x 4 2 x 1 2 x 4
Tightening torque		N.m	1.7
Connection to spring terminals	Solid cable	mm <sup>2</sup>	— — — — 2 x 1 <sup>(2)</sup> 2 x 6 — — — —
Number of conductors x c.s.a.	Flexible cable without cable end	mm <sup>2</sup>	— — — — 2 x 1.5 <sup>(2)</sup> 2 x 4 — — — —
Connection by bars or lugs			
Bars or lugs		DF534046 eps	
Circuit breaker type			<b>GV2ME●●6</b>
Pitch	Without spreaders	mm	13.5
	With spreaders	mm	—
Bars or cables with lugs	e	mm	≤ 6
	L	mm	≤ 9.5
	L'	mm	≤ 9.5
	d	mm	≤ 10
Screws			M4
Tightening torque		N.m	1.7
Bare cables (copper or aluminium) with connectors	Height (h)	mm	—
	C.s.a.	mm <sup>2</sup>	—
	Tightening torque	N.m	—

<sup>(1)</sup> When mounting on a vertical rail, fit a stop to prevent any slippage.

<sup>(2)</sup> For cross-sections 1 to 1.5 mm<sup>2</sup>, the use of an **LA9D99** cable end reducer is recommended.



# TeSys

## TeSys GV2L, GV2LE Magnetic circuit breakers

### Characteristics

Breaking capacity of GV2L and GV2LE																						
Circuit breaker type				GV2LE										GV2L								
				03 to 06	07	08	10	14	16	20	22	32	03 to 05	06 & 07		08	10	14	16	20	22	32
Rating			A	0.4 to 1.6	2.5	4	6.3	10	14	18	25	32	0.4 to 1	1.6 to 2.5	4	6.3	10	14	18	25	32	
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	★	★	★	★	★	★	★	50	50	★	★	★	★	★	★	★	50	50	
		Ics % <sup>(1)</sup>		★	★	★	★	★	★	★	100	100	★	★	★	★	★	★	★	100	100	
	400/415 V	Icu	kA	★	★	★	★	★	15	15	15	10	★	★	★	★	★	50	50	50	50	
		Ics % <sup>(1)</sup>		★	★	★	★	★	50	50	40	50	★	★	★	★	★	50	50	50	50	
	440 V	Icu	kA	★	★	★	50	15	8	8	6	6	★	★	★	★	20	20	20	20	20	
		Ics % <sup>(1)</sup>		★	★	★	100	100	50	50	50	50	★	★	★	★	75	75	75	75	75	
	500 V	Icu	kA	★	★	★	50	10	6	6	4	4	★	★	★	★	10	10	10	10	10	
		Ics % <sup>(1)</sup>		★	★	★	100	100	75	75	75	75	★	★	★	★	100	75	75	75	75	
	690 V	Icu	kA	★	3	3	3	3	3	3	3	3	★	4	4	4	4	4	4	4	4	
		Ics % <sup>(1)</sup>		★	75	75	75	75	75	75	75	75	★	100	100	100	100	100	100	100	100	
	Associated fuses (if required) if Isc > breaking capacity Icu conforming to IEC 60947-2 amendment 1	230/240 V	aM	A	★	★	★	★	★	★	★	80	80	★	★	★	★	★	★	★	100	100
			gG	A	★	★	★	★	★	★	★	100	100	★	★	★	★	★	★	★	125	125
		400/415 V	aM	A	★	★	★	★	★	63	63	80	80	★	★	★	★	★	80	100	100	100
			gG	A	★	★	★	★	★	80	80	100	100	★	★	★	★	★	100	125	125	125
		440 V	aM	A	★	★	★	50	50	50	50	63	63	★	★	★	★	50	63	80	80	80
			gG	A	★	★	★	63	63	63	63	80	80	★	★	★	★	63	80	100	100	100
		500 V	aM	A	★	★	★	50	50	50	50	50	50	★	★	★	★	50	50	50	50	50
			gG	A	★	★	★	63	63	63	63	63	63	★	★	★	★	63	63	63	63	63
		690 V	aM	A	★	16	25	32	32	40	40	40	40	★	20	25	40	40	50	50	50	50
			gG	A	★	20	32	40	40	50	50	50	50	★	25	32	50	50	63	63	63	63
Cable protection against thermal stress in the event of short-circuit (PVC insulated copper cables) Minimum c.s.a. protected at 40 °C and at Isc max.		1 mm²		kA	●	●	●	≤10	≤6	(2)	(2)	(2)	(2)	●	●	●	≤10	≤6	(2)	(2)	(2)	(2)
		1.5 mm²		kA	●	●	●	≤20	≤10	(2)	(2)	(2)	(2)	●	●	●	≤20	≤10	(2)	(2)	(2)	(2)
	2.5 mm²			●	●	●	●	●	●	●	●	(2)	●	●	●	●	●	●	●	●	(2)	
	4...6 mm²			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	

\* > 100 kA.  
 ● Cable c.s.a. protected.  
 (1) As % of Icu.  
 (2) Cable c.s.a. not protected.



# TeSys

## TeSys GV2ME, GV2P Thermal-magnetic circuit breakers

### Characteristics

Breaking capacity of GV2ME, GV2RT and GV2P																						
Circuit breaker type				GV2ME and GV2RT										GV2P								
				01 to 06	07	08	10	14	16	20	21 & 22	32	01 to 06	07	08	10	14	16	20	21 & 22	32	
Rating			A	0.1 to 1.6	2.5	4	6.3	10	14	18	23 & 25	32	0.1 to 1.6	2.5	4	6.3	10	14	18	23 & 25	32	
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	★	★	★	★	★	★	★	50	50	★	★	★	★	★	★	★	★	★	
		Ics % <sup>(1)</sup>		★	★	★	★	★	★	★	★	100	100	★	★	★	★	★	★	★	★	★
	400/415 V	Icu	kA	★	★	★	★	★	15	15	15	10	★	★	★	★	★	★	50	50	50	
		Ics % <sup>(1)</sup>		★	★	★	★	★	50	50	40	50	★	★	★	★	★	★	50	50	50	
	440 V	Icu	kA	★	★	★	50	15	8	8	6	6	★	★	★	★	★	50	20	20	20	
		Ics % <sup>(1)</sup>		★	★	★	100	100	50	50	50	50	★	★	★	★	★	75	75	75	75	
	500 V	Icu	kA	★	★	★	50	10	6	6	4	4	★	★	★	★	50	42	10	10	10	
		Ics % <sup>(1)</sup>		★	★	★	100	100	75	75	75	75	★	★	★	★	100	75	75	75	75	
	690 V	Icu	kA	★	3	3	3	3	3	3	3	3	★	8	8	6	6	6	4	4	4	
		Ics % <sup>(1)</sup>		★	75	75	75	75	75	75	75	75	★	100	100	100	100	100	100	100	100	
	Associated fuses (if required) if Isc > breaking capacity Icu conforming to IEC 60947-2	230/240 V	aM	A	★	★	★	★	★	★	★	80	80	★	★	★	★	★	★	★	★	★
			gG	A	★	★	★	★	★	★	★	100	100	★	★	★	★	★	★	★	★	★
		400/415 V	aM	A	★	★	★	★	★	63	63	80	80	★	★	★	★	★	★	100	100	100
			gG	A	★	★	★	★	★	80	80	100	100	★	★	★	★	★	★	125	125	125
		440 V	aM	A	★	★	★	50	50	50	50	63	63	★	★	★	★	★	50	63	80	80
			gG	A	★	★	★	63	63	63	63	80	80	★	★	★	★	★	63	80	100	100
500 V		aM	A	★	★	★	50	50	50	50	50	50	★	★	★	★	50	50	50	50	50	
		gG	A	★	★	★	63	63	63	63	63	63	★	★	★	★	63	63	63	63	63	
690 V		aM	A	★	16	25	32	32	40	40	40	40	★	20	25	40	40	50	50	50	50	
		gG	A	★	20	32	40	40	50	50	50	50	★	25	32	50	50	63	63	63	63	

\* > 100 kA.

(1) As % of Icu.



# TeSys

## TeSys GV2ME, GV2P Thermal-magnetic circuit breakers

### Characteristics

Breaking capacity of GV2ME, GV2RT and GV2P (used in association with current limiter GV1L3)														
Circuit breaker type				GV2ME and GV2RT										
				01 to 06	07	08	10	14	16	20	21	22	32	
Rating			A	0.1 to 1.6	2.5	4	6.3	10	14	18	23	25	32	
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	★	★	★	★	★	★	★	★	★	★	
		Ics % <sup>(1)</sup>		★	★	★	★	★	★	★	★	★	★	
	400/415 V	Icu	kA	★	★	★	★	★	100	100	100	100	100	
		Ics % <sup>(1)</sup>		★	★	★	★	★	50	50	40	40	40	
	440 V	Icu	kA	★	★	★	★	★	50	20	20	20	20	
		Ics % <sup>(1)</sup>		★	★	★	★	★	75	75	75	75	75	
	500 V	Icu	kA	★	★	★	★	50	42	10	10	10	10	
		Ics % <sup>(1)</sup>		★	★	★	★	100	100	75	75	75	75	
Circuit breaker type				GV2P										
Rating			A	0.1 to 1.6	2.5	4	6.3	10	14	16	20	21	22	32
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	★	★	★	★	★	★	★	★	★	★	★
		Ics % <sup>(1)</sup>		★	★	★	★	★	★	★	★	★	★	
	400/415 V	Icu	kA	★	★	★	★	★	★	★	★	★	★	
		Ics % <sup>(1)</sup>		★	★	★	★	★	★	★	★	★	★	
	440 V	Icu	kA	★	★	★	★	★	100	100	100	100	100	
		Ics % <sup>(1)</sup>		★	★	★	★	★	50	50	50	50	50	
	500 V	Icu	kA	★	★	★	★	100	100	100	100	100	100	
		Ics % <sup>(1)</sup>		★	★	★	★	50	50	50	50	50	50	
	690 V <sup>(3)</sup>	Icu = Ics	kA	★	50	50	50	50	50	50	50	50	50	50
Circuit breaker type				GV2ME										
Rating			A	0.1 to 1.6	2.5	4	6.3	10	14	16	20	21	22	32
Cable protection against thermal stress in the event of short-circuit (PVC insulated copper cables)	Minimum c.s.a. protected at 40 °C at Isc max.	1 mm²		●	●	●	≤ 10 kA	≤ 6 kA	<sup>(2)</sup>	<sup>(2)</sup>	<sup>(2)</sup>	<sup>(2)</sup>	<sup>(2)</sup>	
		1.5 mm²		●	●	●	≤ 20 kA	≤ 10 kA	<sup>(2)</sup>	<sup>(2)</sup>	<sup>(2)</sup>	<sup>(2)</sup>	<sup>(2)</sup>	
		2.5 mm²		●	●	●	●	●	●	●	●	●	<sup>(2)</sup>	
		4...6 mm²		●	●	●	●	●	●	●	●	●	●	

★ > 100 kA.  
 ● Cable c.s.a. protected.  
<sup>(1)</sup> As % of Icu.  
<sup>(2)</sup> Cable c.s.a. not protected.  
<sup>(3)</sup> With limiter LA9LB920.



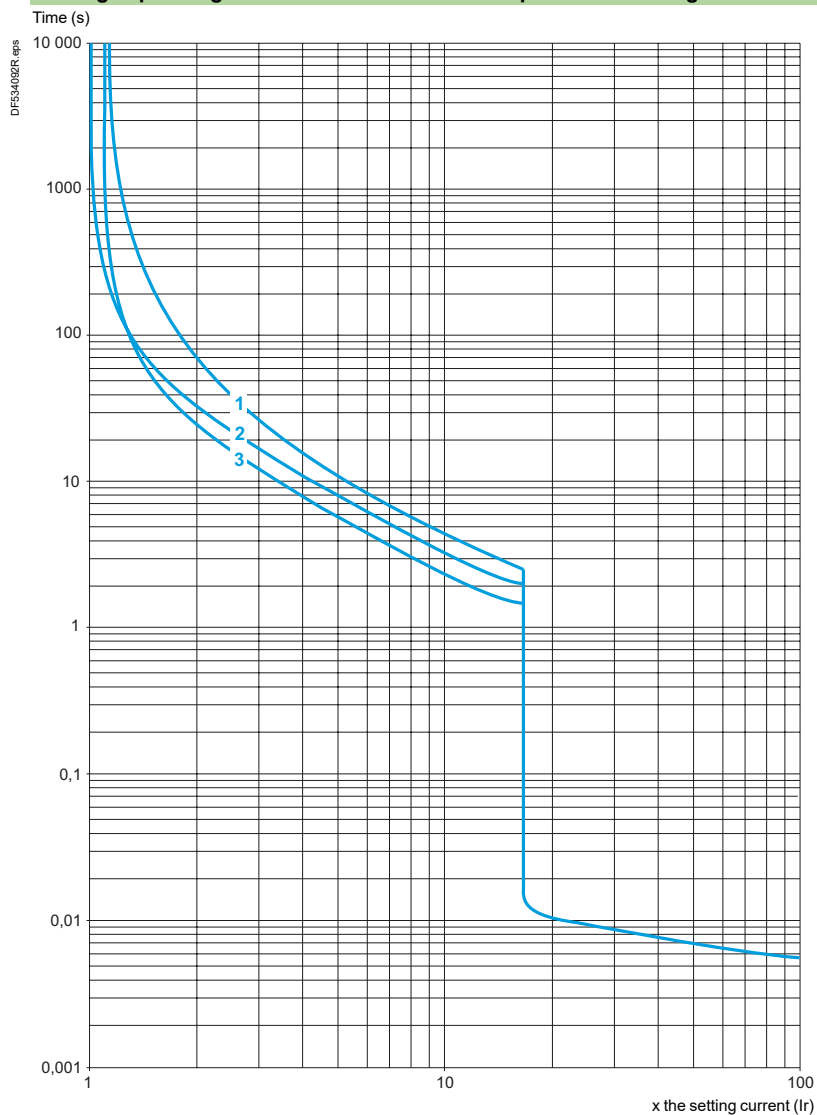
# TeSys

## TeSys GV2L, GV2LE Magnetic circuit breakers

### Curves

#### Tripping curves for GV2L or LE combined with thermal overload relay LRD or LR2K

Average operating times at 20 °C related to multiples of the setting current



- 1 3 poles from cold state
- 2 2 poles from cold state
- 3 3 poles from hot state

Ref.



Circuit  
breakers



# TeSys

## TeSys GV2L, GV2LE Magnetic circuit breakers

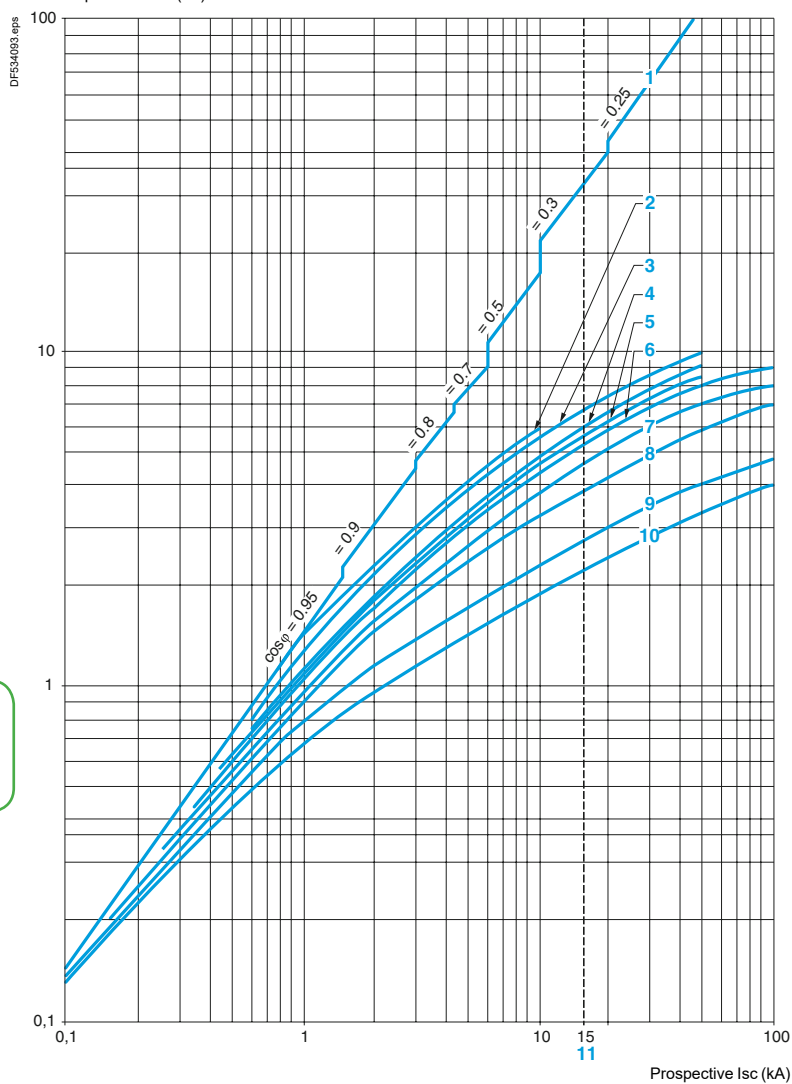
### Curves

#### Current limitation on short-circuit for GV2L and GV2LE only (3-phase 400/415 V)

##### Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$

Limited peak current (kA)



1 Maximum peak current

2 32 A

3 25 A

4 18 A

5 14 A

6 10 A

7 6.3 A

8 4 A

9 2.5 A

10 1.6 A

11 Limit of rated ultimate breaking capacity on short-circuit of GV2LE (14, 18, 23 and 25 A ratings).



# TeSys

## TeSys GV2L, GV2LE Magnetic circuit breakers

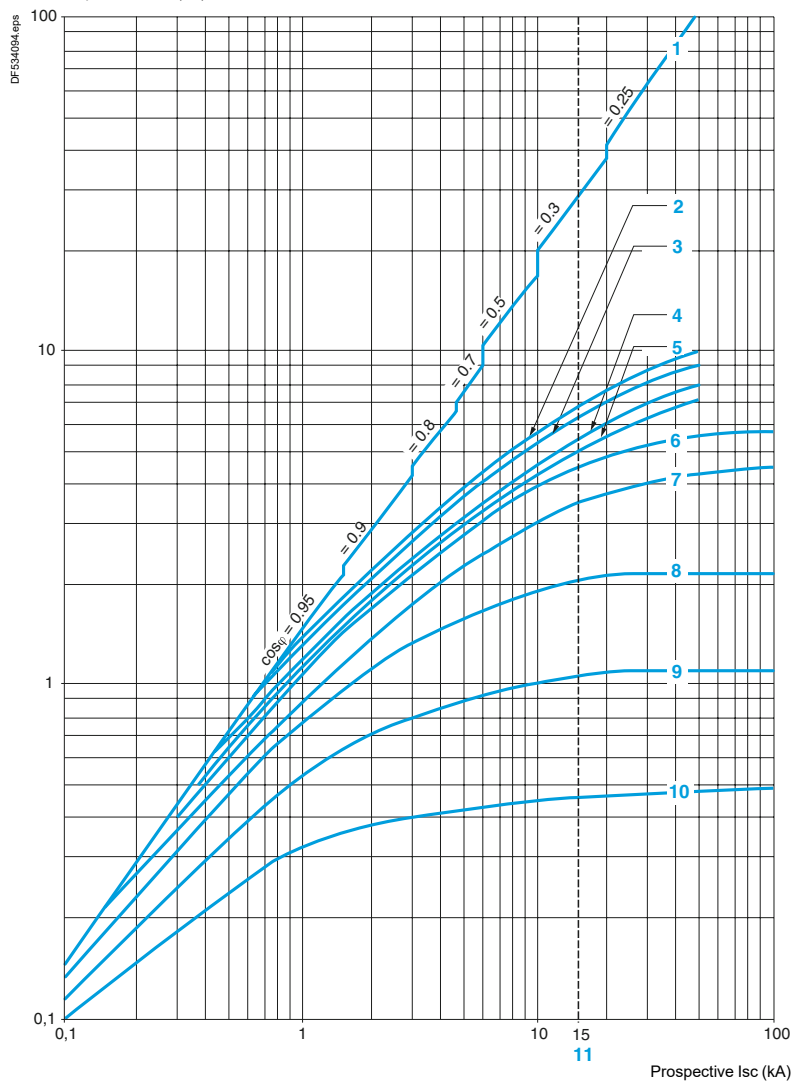
### Curves

#### Current limitation on short-circuit for GV2L and GV2LE + thermal overload relay LRD or LR2K (3-phase 400/415 V)

##### Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$

Limited peak current (kA)



1 Maximum peak current

2 32 A

3 25 A

4 18 A

5 14 A

6 10 A

7 6.3 A

8 4 A

9 2.5 A

10 1.6 A

11 Limit of rated ultimate breaking capacity on short-circuit of GV2LE (14, 18, 23 and 25 A ratings).



# TeSys

## TeSys GV2LE Magnetic circuit breakers

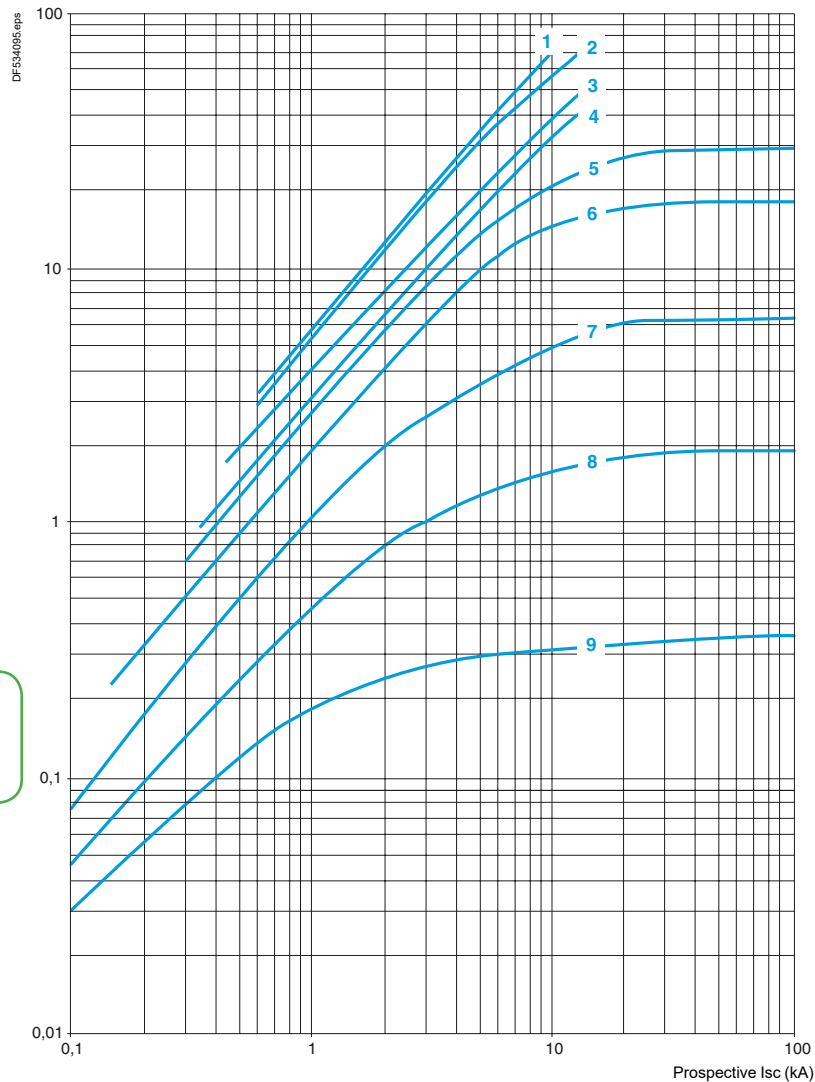
### Curves

#### Thermal limit on short-circuit for GV2LE only

#### Thermal limit in kA<sup>2</sup>s in the magnetic operating zone

Sum of  $I^2dt = f$  (prospective  $I_{sc}$ ) at 1.05  $U_e = 435$  V

Sum of  $I^2dt$  (kA<sup>2</sup>s)



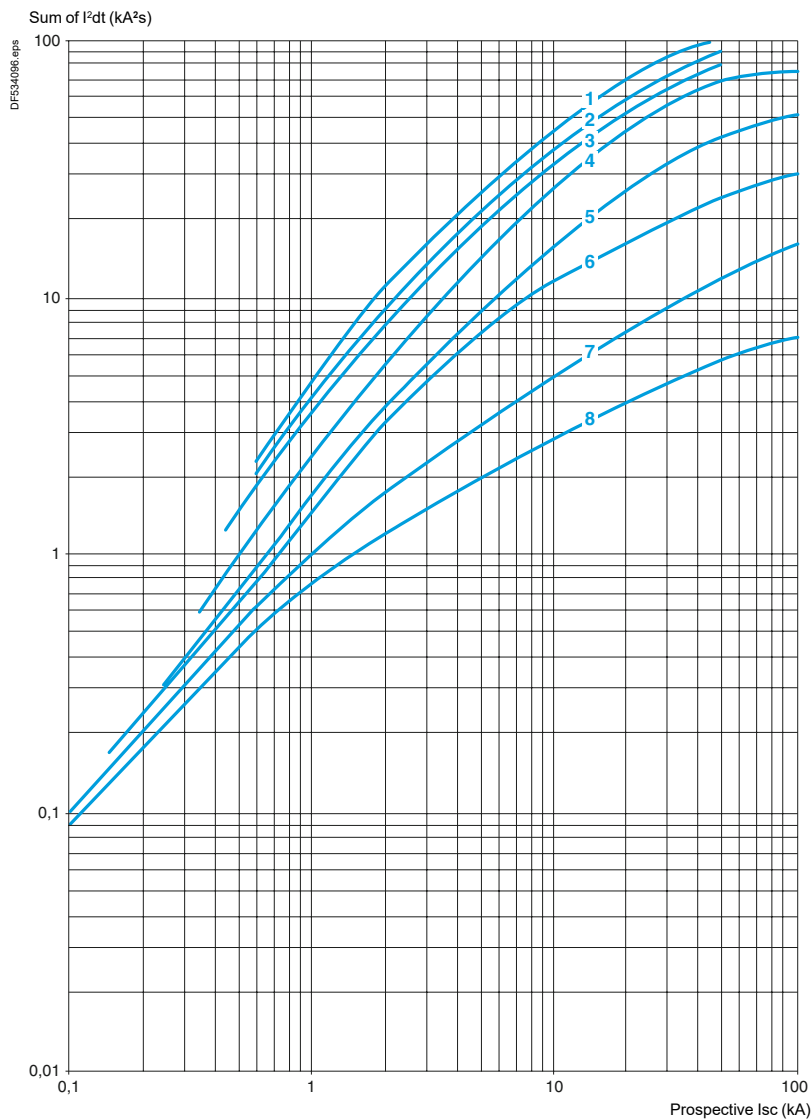
- 1 32 A
- 2 25 A
- 3 18 A
- 4 14 A
- 5 10 A
- 6 6.3 A
- 7 4 A
- 8 2.5 A
- 9 1.6 A



#### Thermal limit on short-circuit for GV2L only

#### Thermal limit in $\text{kA}^2\text{s}$ in the magnetic operating zone

Sum of  $I^2dt = f$  (prospective  $I_{sc}$ ) at  $1.05 U_e = 435 \text{ V}$



- 1 25 A and 32 A
- 2 18 A
- 3 14 A
- 4 10 A
- 5 6.3 A
- 6 4 A
- 7 2.5 A
- 8 1.6 A



# TeSys

## TeSys GV2L, GV2LE Magnetic circuit breakers

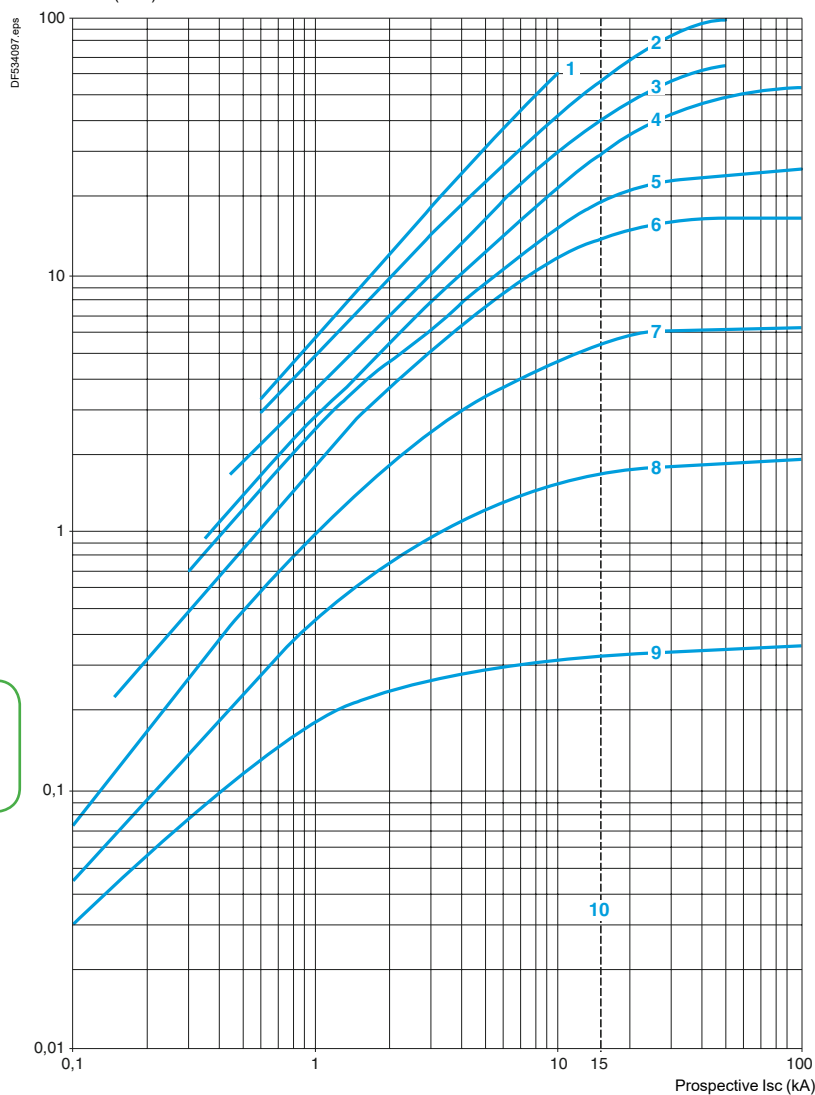
### Curves

Thermal limit on short-circuit for GV2L and GV2LE + thermal overload relay LRD or LR2K

Thermal limit in  $\text{kA}^2\text{s}$  in the magnetic operating zone

Sum of  $I^2dt = f$  (prospective  $I_{sc}$ ) at  $1.05 U_e = 435 \text{ V}$

Sum of  $I^2dt$  ( $\text{kA}^2\text{s}$ )

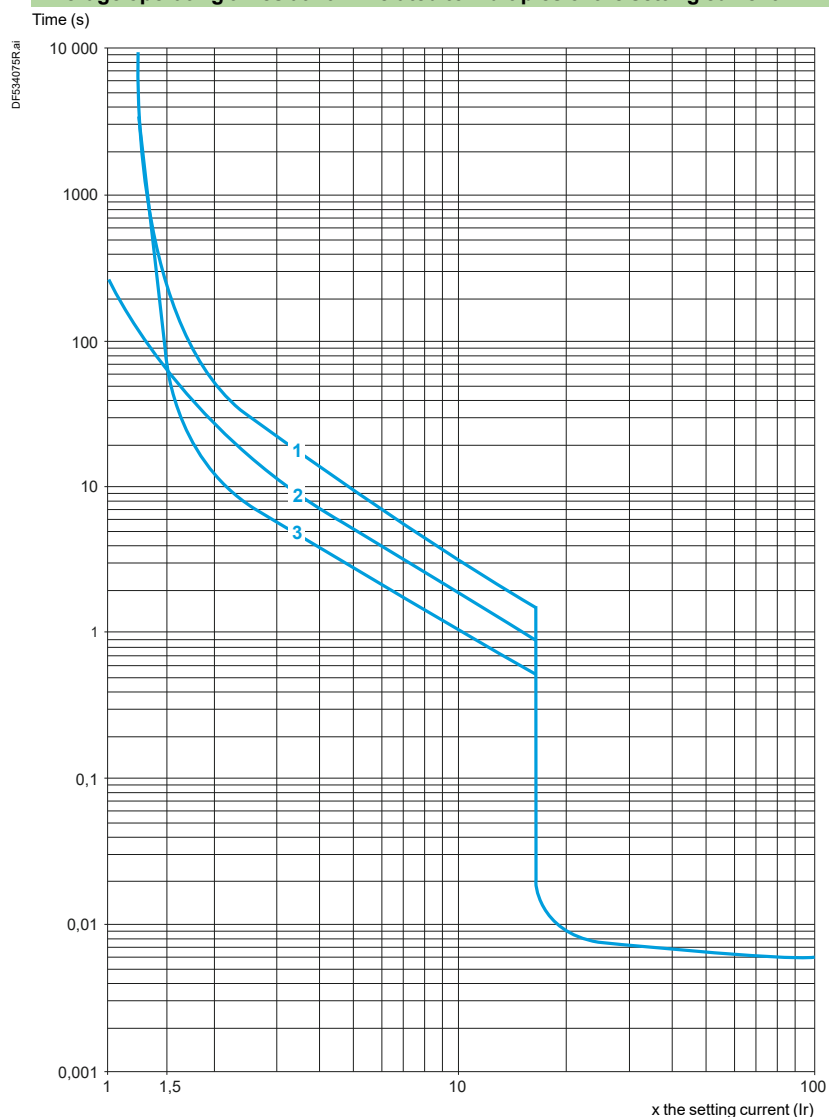


- 1 32 A (GV2LE32)
- 2 25 A and 32 A (GV2L32)
- 3 18 A
- 4 14 A
- 5 10 A
- 6 6.3 A
- 7 4 A
- 8 2.5 A
- 9 1.6 A
- 10 Limit of rated ultimate breaking capacity on short-circuit of GV2LE (14, 18, 23 and 25 A ratings).



#### Thermal-magnetic tripping curves for GV2ME, GV2RT and GV2P

Average operating times at 20 °C related to multiples of the setting current



- 1 3 poles from cold state
- 2 2 poles from cold state
- 3 3 poles from hot state

Ref.



Circuit  
breakers

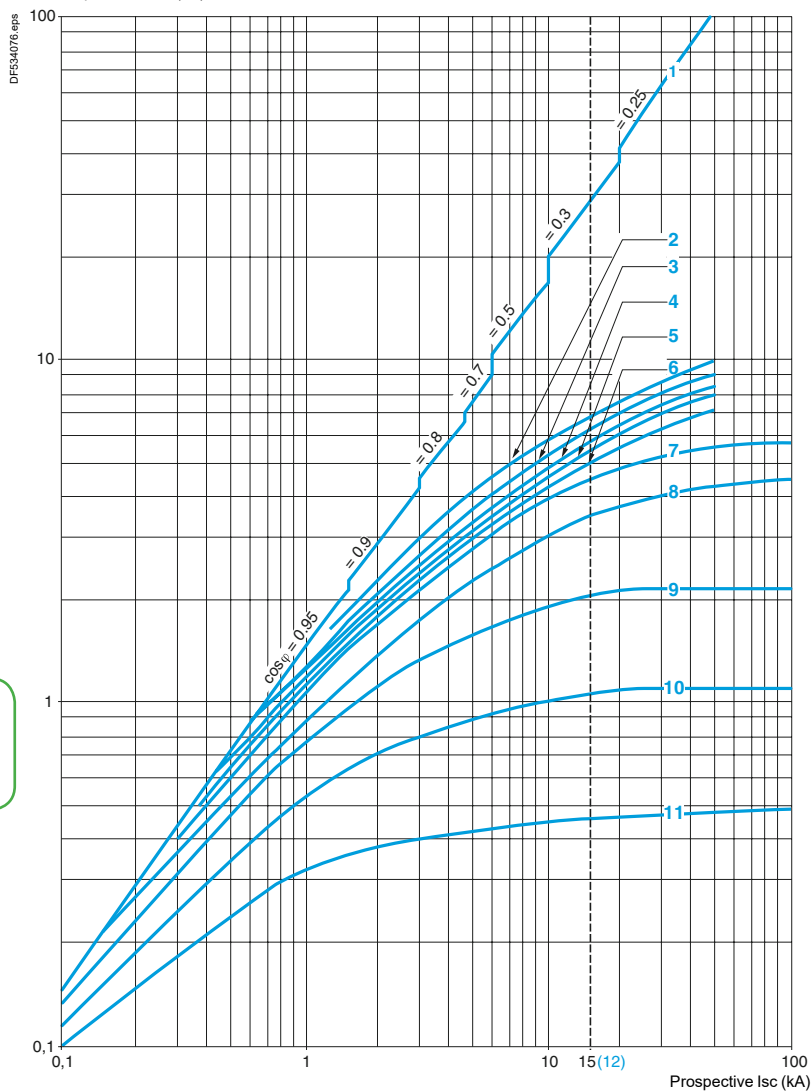


#### Current limitation on short-circuit for GV2ME, GV2RT and GV2P (3-phase 400/415 V)

##### Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$

Limited peak current (kA)



1 Maximum peak current

2 24 - 32 A

3 20 - 25 A

4 17 - 23 A

5 13 - 18 A

6 9 - 14 A

7 6 - 10 A

8 4 - 6.3 A

9 2.5 - 4 A

10 1.6 - 2.5 A

11 1 - 1.6 A

12 Limit of rated ultimate breaking capacity on short-circuit of GV2ME (14, 18, 23 and 25 A ratings)

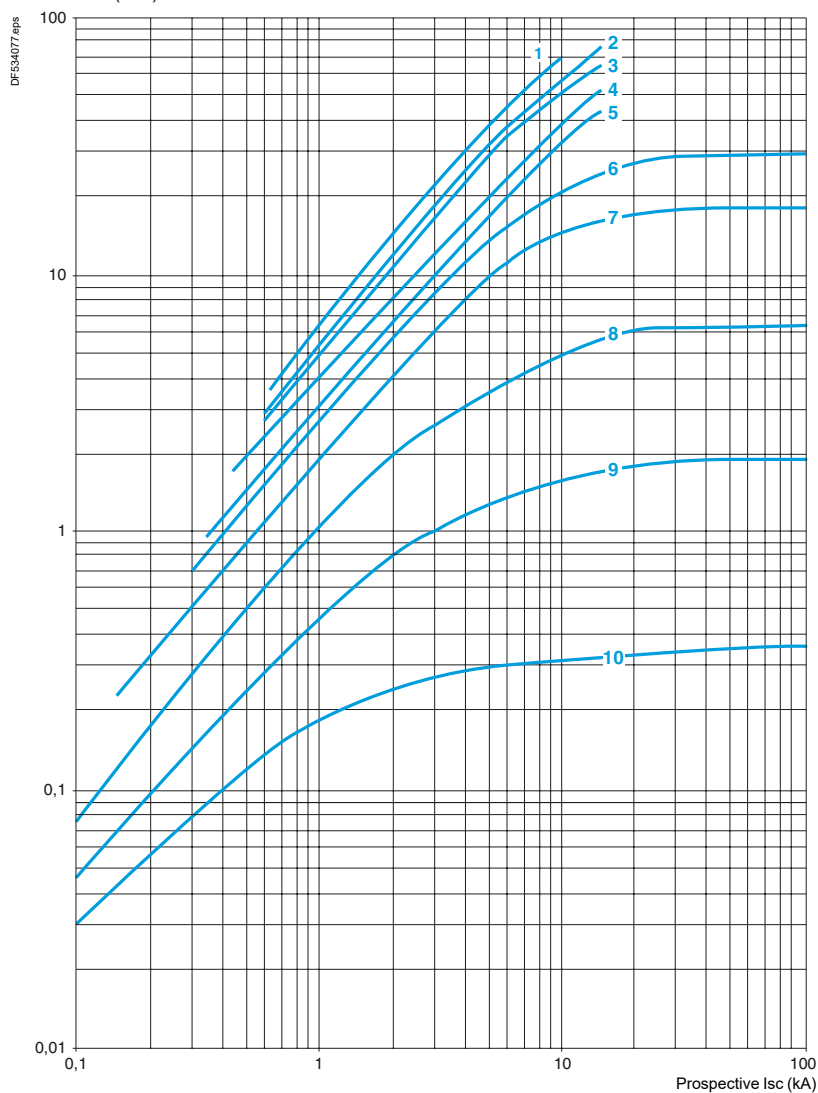


#### Thermal limit on short-circuit for GV2ME and GV2RT

#### Thermal limit in $\text{kA}^2\text{s}$ in the magnetic operating zone

Sum of  $I^2dt = f$  (prospective  $I_{sc}$ ) at  $1.05 U_e = 435 \text{ V}$

Sum of  $I^2dt$  ( $\text{kA}^2\text{s}$ )



- 1 24 - 32 A
- 2 20 - 25 A
- 3 17 - 23 A
- 4 13 - 18 A
- 5 9 - 14 A
- 6 6 - 10 A
- 7 4 - 6.3 A
- 8 2.5 - 4 A
- 9 1.6 - 2.5 A
- 10 1 - 1.6 A



# TeSys

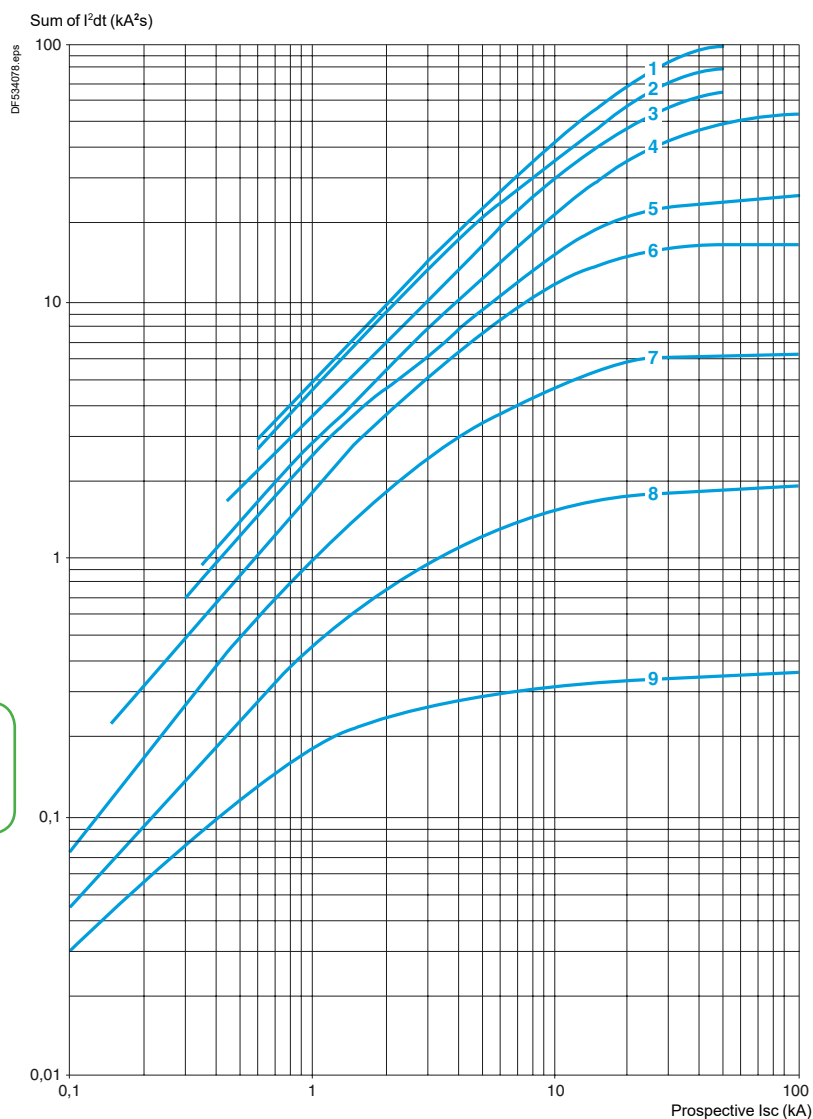
## TeSys GV2P Thermal-magnetic circuit breakers

### Curves

#### Thermal limit on short-circuit for GV2P

#### Thermal limit in kA<sup>2</sup>s in the magnetic operating zone

Sum of  $I^2dt = f$  (prospective  $I_{sc}$ ) at 1.05  $U_e = 435$  V



- 1 20 - 25 A, 24 - 32 A
- 2 17 - 23 A
- 3 13 - 18 A
- 4 9 - 14 A
- 5 6 - 10 A
- 6 4 - 6.3 A
- 7 2.5 - 4 A
- 8 1.6 - 2.5 A
- 9 1 - 1.6 A



Characteristics of GV2 electric trips					
Type of trip			GVAU... MN undervoltage trip	GVAX... MN undervoltage trip for GV2ME - safety device for dangerous machines	GVAS... MX shunt trip
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690	500	690
	Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1	V	600	-	600
Operational voltage (Ue)	Conforming to IEC 60947-1	V	0.85...1.1 Uc	0.85...1.1 Uc	0.7...1.1 Uc
Drop-out voltage		V	0.7...0.35 Uc	0.7...0.35 Uc	0.75...0.2 Uc
Inrush consumption	~	VA	12	12	14
Sealed consumption	~	VA	3.5	3.5	5
Operating time	Conforming to IEC 60947-1	ms	From the moment the voltage reaches its operational value until opening of the circuit breaker. 10...15		
On-load factor			100 %		
Cabling (screw clamp connection)	Number of conductors		2 or 4		
	Solid cable	mm <sup>2</sup>	1...2.5		
	Flexible cable without cable end	mm <sup>2</sup> AWG	0.75...2.5		
	Flexible cable with cable end	mm <sup>2</sup>	0.75...2.5		
Tightening torque		N.m	1.4 max		
Mechanical durability (C.O.: Close - Open)		C.O.	30000 (GV2ME and GV2P)		

Ref.



Circuit breakers



# TeSys

## TeSys GV - Auxiliary contacts for GV2 circuit breakers

### Characteristics

Ref.

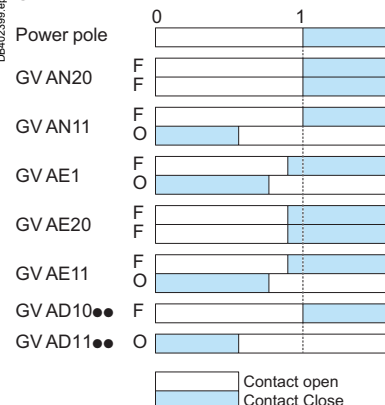


Circuit breakers

Type of contacts			Instantaneous auxiliary GVAN, GVAD								Fault signalling GVAD, GVAM11 <sup>(1)</sup>				Instantaneous auxiliary GVAE							
Rated insulation voltage (Ui) (associated insulation coordination)	Conforming to IEC 60947-1	V	690								690				250 (690 in relation to main circuit)							
	Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1	V	600								300				300							
Conventional thermal current (Ith)	Conforming to IEC 60947-5-1	A	6								2.5				2.5							
	Conforming to UL 60947-5-1, CSA C22.2 n° 60947-5-1	A	5								1				1							
Mechanical durability (C.O.: Close - Open)		C.O.	100 000								1000				100 000							
Operational power and current conforming to IEC 60947-5-1. a.c. operation			AC-15/100 000 C.O.								AC-14/1000 C.O.				AC-15/100 000 C.O.							
	Rated operational voltage (Ue)	V	48	110 127	230 240	380 415	440	500	690	24	48	110 127	230 240	24	48	110 127	230 240					
Operation	Operational power, normal conditions	VA	300	500	720	850	650	500	414	36	48	72	72	48	60	120	120					
	Occasional breaking and making capacities, abnormal conditions	kVA	3	7	13	15	13	12	9	0.22	0.3	0.45	0.45	0.48	0.6	1.27	2.4					
	Rated operational current (Ie)	A	6	4.5	3.3	2.2	1.5	1	0.6	1.5	1	0.5	0.3	2	1.25	1	0.5					
Operational power and current conforming to IEC 60947-5-1. d.c.			DC-13/100 000 C.O.								DC-13/1000 C.O.				DC-13/100 000 C.O.							
	Rated operational voltage (Ue)	V	24	48	60	110	240 (2)	–	–	24	48	60	–	24	48	60	–					
Operation	Operational power, normal conditions	W	140	240	180	140	120	–	–	24	15	9	–	24	15	9	–					
	Occasional breaking and making capacities, abnormal conditions	W	240	360	240	210	180	–	–	100	50	50	–	100	50	50	–					
	Rated operational current (Ie)	A	6	5	3	1.3	0.5	–	–	1	0.3	0.15	–	1	0.3	0.15	–					
Low power switching reliability of contact			GVAE: Number of failures for “n” million operating cycles (17 V-5 mA): = 10 <sup>-6</sup>																			
Minimum operational conditions d.c. operation		V mA	17 5																			
Short-circuit protection			By GB2CB●● circuit breaker (rating according to operational current for Ue ≤ 415 V) or by gG fuse 10 A max												GB2CB06 or gG fuse 10 A max							
Cabling, screw clamp terminals	Number of conductors		1				2															
	Solid cable	mm²	1...2.5				1...2.5															
	Flexible cable without cable end	mm²	0.75...2.5				0.75...2.5															
	Flexible cable with cable end	mm²	0.75...1.5				0.75...1.5															
	Tightening torque	N.m	1.4 max				1.4 max															
Cabling, spring terminal connections	Flexible cable without cable end	mm²	GVAN only 0.75...2.5				0.75...2.5				–				0.75...1.5							

#### Operation of instantaneous auxiliary contacts

##### GV2



#### Operation of fault signalling contacts

##### GVAM11

Change of state following tripping on short-circuit.

##### GVAD10●● and GVAD01●●

Change of state following tripping on short-circuit, overload or undervoltage.

(1) For application example of fault signalling contact and short-circuit signalling contact.

(2) Add an RC circuit type LA4D to the load terminals.



Characteristics of 3-pole busbars GV2G●●●						
			GV2G●●●			
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690			
Conventional thermal current (Ith)	Conforming to IEC 60439-1	A	63			
Rated operational current (Ie)		A	63			
Permissible peak current (I peak)		kA	11			
Permissible thermal limit (I²t)		kA²s	104			
Degree of protection	Conforming to IEC 60529		IP 20			
Terminal block			Yes			
Characteristics of terminal blocks GV2G05 and GV1G09 (for GV2ME and GV2P)						
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690			
Conventional thermal current (Ith)	Conforming to IEC 60439-1	A	63			
Rated operational current (Ie)		A	63	115		
Degree of protection	Conforming to IEC 60529		IP 20			
Connection	Solid cable	mm²	1 x 1.5 to 25 or 2 x 1.5 to 6			
	Flexible cable without cable end	mm²	1 x 1.5 to 16 or 2 x 1.5 to 4			
	Flexible cable with cable end	mm²	1 x 1.5 to 16 or 2 x 1.5 to 4			
	Flexible or solid cable AWG		1 AWG 4			
Tightening torque	Connector	N.m	2.2			
	Screw clamp terminals	N.m	1.7			
Characteristics of current limiters (GV2ME and GV2P)						
Type			GV1L3		LA9LB920	
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690		690	
Conventional thermal current (Ith)	Conforming to IEC 60947-1	A	63		63	
Rated operational current (Ie)		A	32		32	
Operating threshold	rms current	A	1500 (non adjustable threshold)		1000 (non adjustable threshold)	
Connection			1 conductor	2 conductors	1 conductor	2 conductors
	Solid cable	mm²	1.5...25	1.5...10	1.5...25	1.5...10
	Flexible cable without cable end	mm²	1.5...25	2.5...10	1.5...25	1.5...10
	Flexible cable with cable end	mm²	1.5...16	1.5... 4	1.5...16	1.5... 4
Tightening torque		N.m	2.2			

Ref.



Circuit breakers



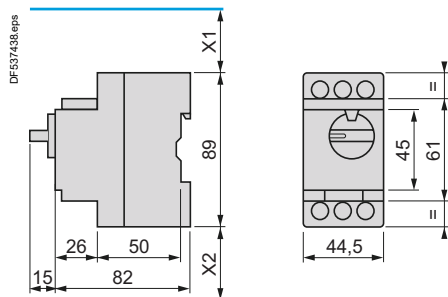
# TeSys

## TeSys GV2L, GV2LE Magnetic circuit breakers

### Dimensions and mounting

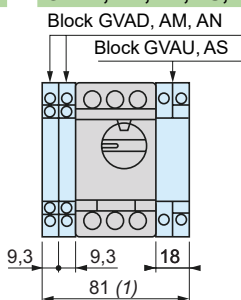
#### GV2L

##### Dimensions



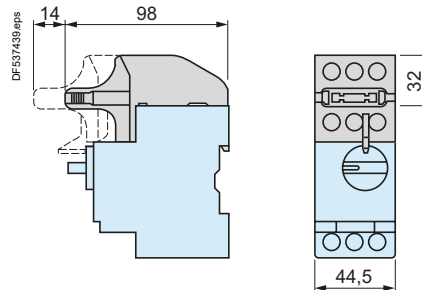
X1 Electrical clearance = 40 mm for  $U_e \leq 415$  V, or 80 mm for  $U_e = 440$  V, or 120 mm for  $U_e = 500$  and 690 V.  
X2 = 40 mm.

##### GVAD, AM, AN, AU, AS



(1) Maximum.

##### GV2AK00



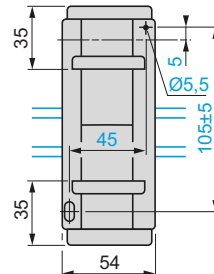
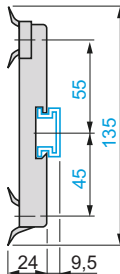
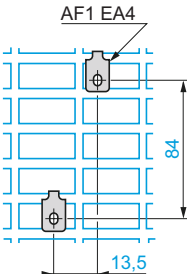
##### Mounting

On rail AM1DE200, AM1ED200 (35 x 15)

Panel mounted

On pre-slotted mounting plate AM1PA

##### Adapter plate GK2AF01

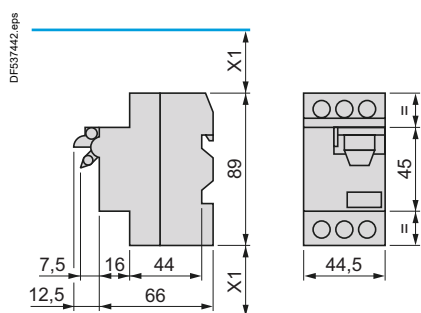


##### 7.5 mm height compensation plate GV1F03



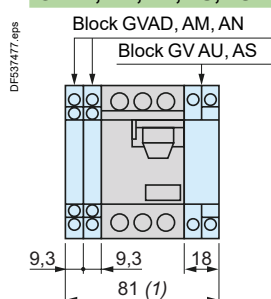
#### GV2LE

##### Dimensions



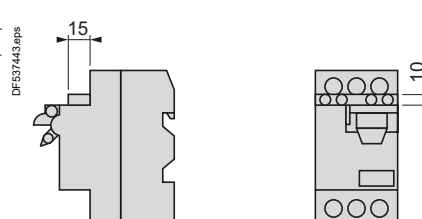
X1 Electrical clearance = 40 mm for  $U_e \leq 690$  V.

##### GVAD, AM, AN, AU, AS



(1) Maximum.

##### GVAE



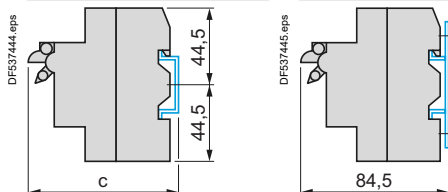
##### Mounting

On 35 mm rail

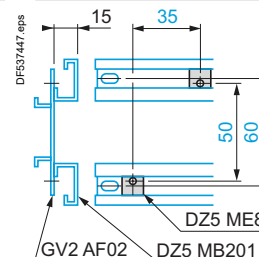
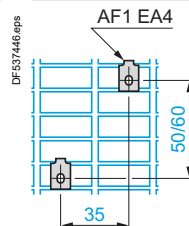
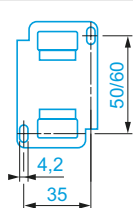
On panel with adapter plate GV2AF02

On pre-slotted plate AM1PA

On rails DZ5MB201



c = 80 on AM1DP200 (35 x 7.5) and 88 on AM1DE200, ED200 (35 x 15)





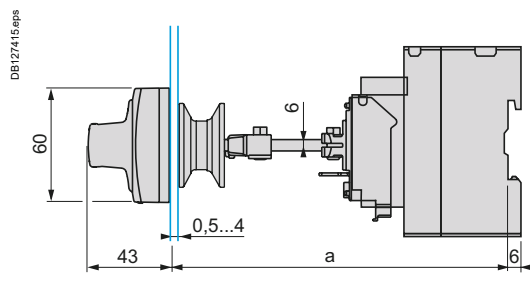
# TeSys

## TeSys GV2L, GV2LE Magnetic circuit breakers

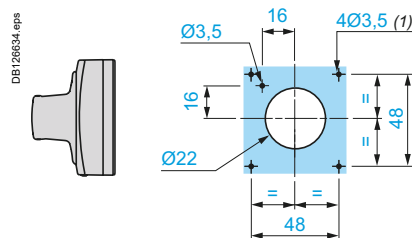
### Dimensions and mounting

#### Mounting

##### Mounting of external operator GV2APN01, GV2APN02 or GV2APN04 for motor circuit breakers GV2L

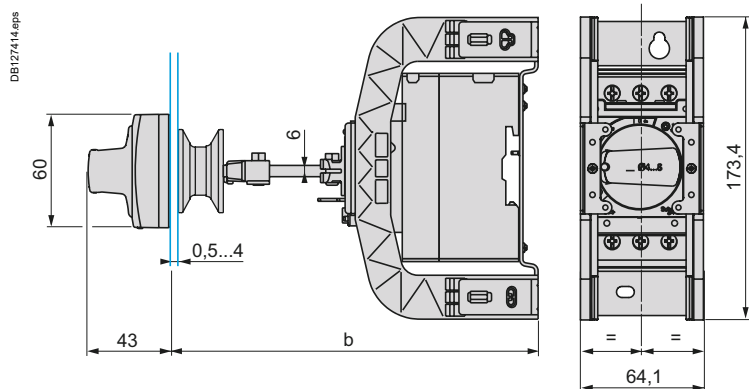


##### Door cut-out

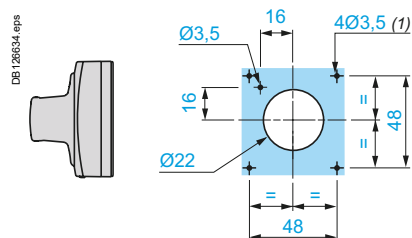


(1) For IP65 only.

##### Mounting of external operator GVAPH02 for motor circuit breakers GV2L



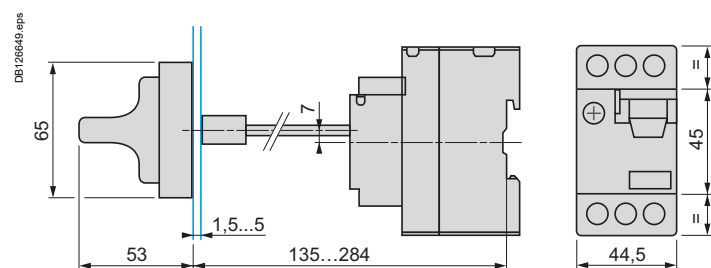
##### Door cut-out



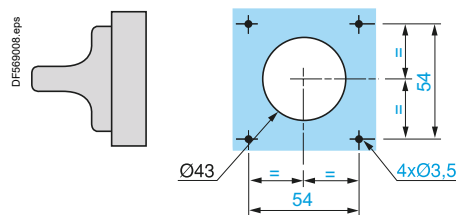
(1) For IP65 only.

	a		b	
	Mini	Maxi	Mini	Maxi
GV2APN●●	140	250		
GV2APN●● + GVAPH02			151	250
GV2APN●● + GVAPK11	250	434	-	-
GV2APN●● + GVAPH02 + GVAPK11	-	-	250	445

##### Mounting of external operator GV2AP03 for GV2LE



##### Door cut-out





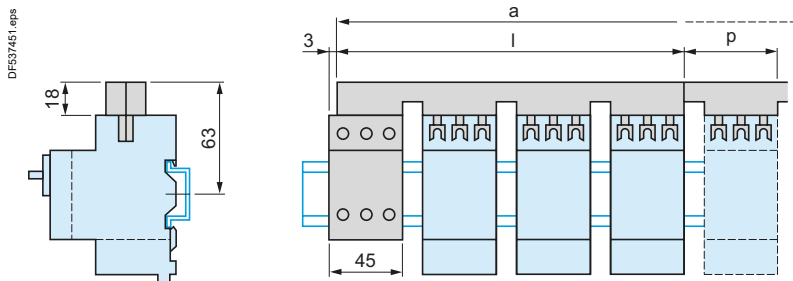
# TeSys

## TeSys GV2L, GV2LE Magnetic circuit breakers

### Dimensions and mounting

#### GV2LE

Sets of busbars GV2G445, GV2G454, GV2G472, with terminal block GV2G05



	<b>l</b>	<b>p</b>
<b>GV2G445</b> (4 x 45 mm)	179	45
<b>GV2G454</b> (4 x 54 mm)	206	54
<b>GV2G472</b> (4 x 72 mm)	260	72

Ref.

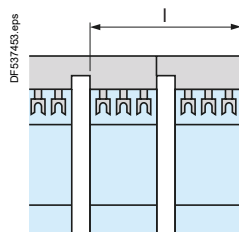
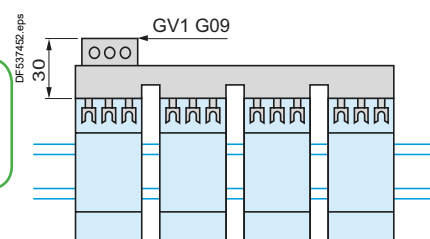
	<b>a</b>			
Number of tap-offs	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
<b>GV2G445</b>	224	269	314	359
<b>GV2G454</b>	260	314	368	422
<b>GV2G472</b>	332	404	476	548

#### Sets of busbars GV2LE

Sets of busbars GV2G●●● with term. block GV1G09

Sets of busbars GV2G245, GV2G254, GV2GR272

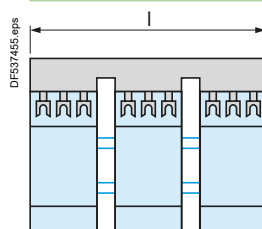
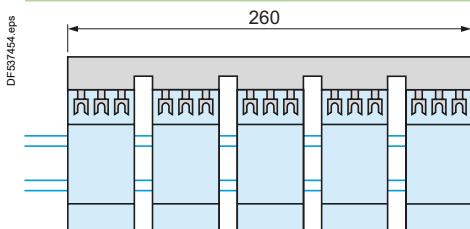
Circuit breakers



	<b>l</b>
<b>GV2G245</b> (2 x 45 mm)	89
<b>GV2G254</b> (2 x 54 mm)	98
<b>GV2G272</b> (2 x 72 mm)	116

#### Set of busbars GV2G554

Sets of busbars GV2G345 and GV2G354

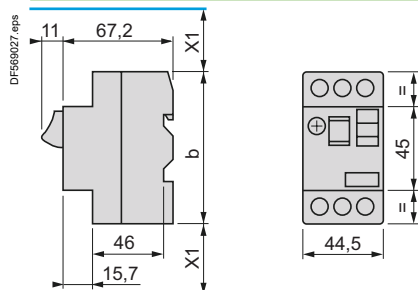


	<b>l</b>
<b>GV2G345</b> (3 x 45 mm)	134
<b>GV2G354</b> (3 x 54 mm)	152

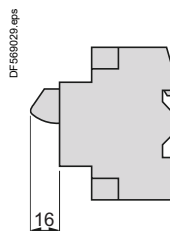


#### Dimensions

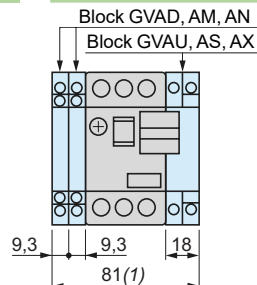
##### GV2ME



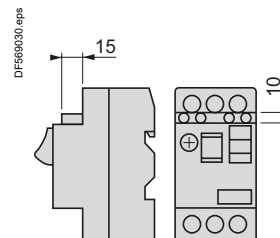
##### GVAX



##### GVAD, AM, AN, AU, AS, AX



##### GVAE



#### b

GV2ME●●

89

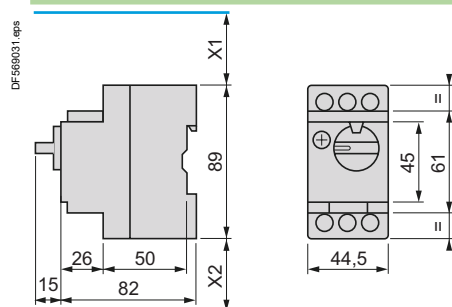
GV2ME●●3

101

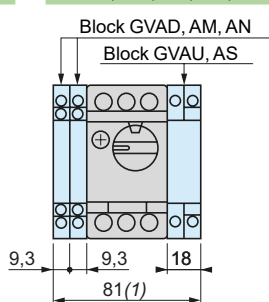
(1) Maximum.

X1 Electrical clearance = 40 mm for  $U_e \leq 690$  V

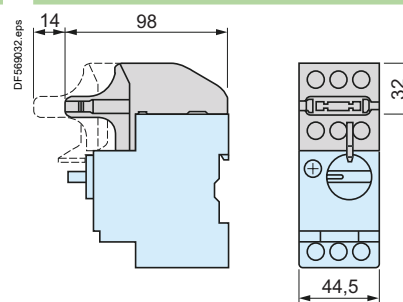
##### GV2P



##### GVAD, AM, AN, AU, AS



##### GV2AK00

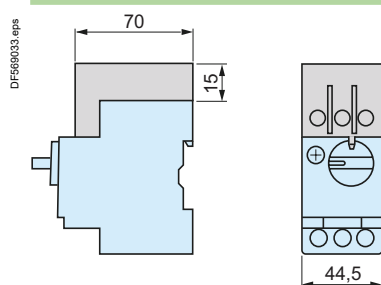


(1) Maximum.

X1 Electrical clearance = 40 mm for  $U_e \leq 415$  V, or 80 mm for  $U_e = 440$  V, or 120 mm for  $U_e = 500$  and 690 V

X2 = 40 mm

##### GV2GH7





#### Mounting

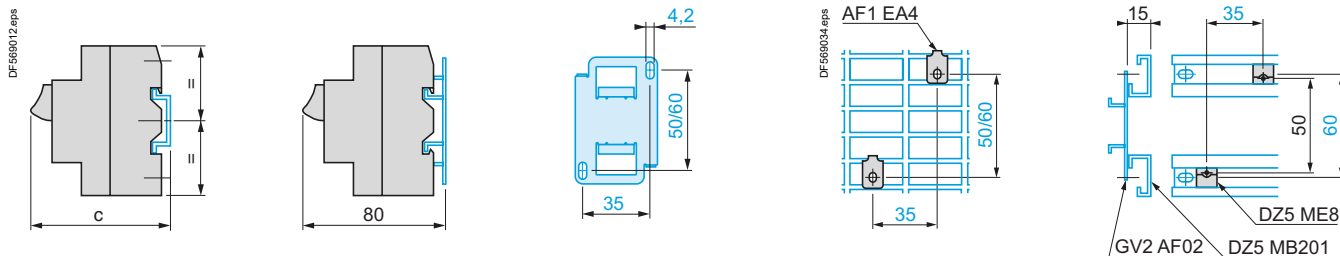
##### GV2ME

On 35 mm rail

On panel with adapter plate GV2AF02

On pre-slotted plate AM1PA

On rails DZ5MB201



c = 78.5 on AM1 DP200 (35 x 7.5)  
c = 86 on AM1 DE200, ED200 (35 x 15)

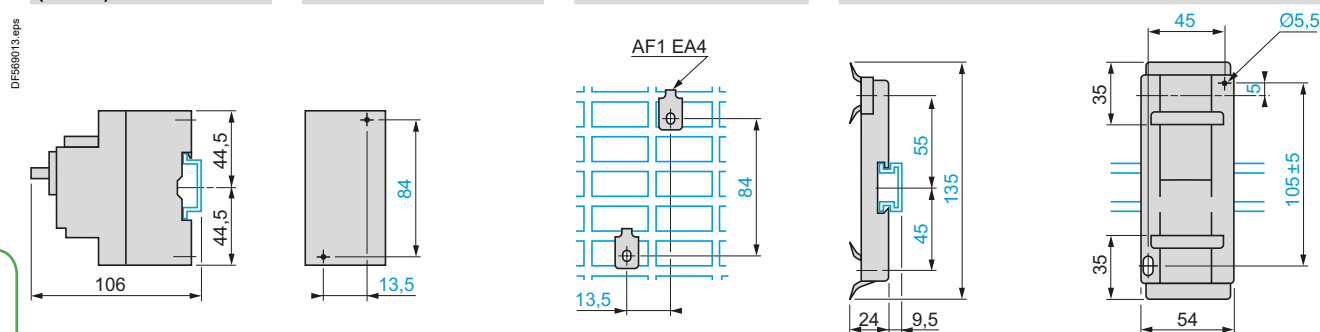
##### GV2P

On rail AM1DE200, ED200 (35 x 15)

Panel mounted

On pre-slotted plate AM1PA

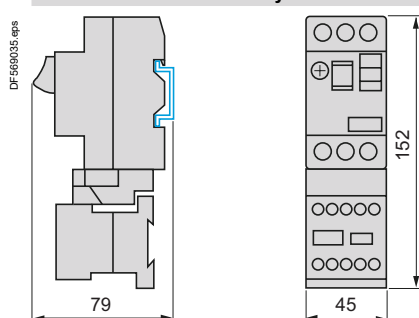
Adapter plate GK2AF01



#### Dimensions

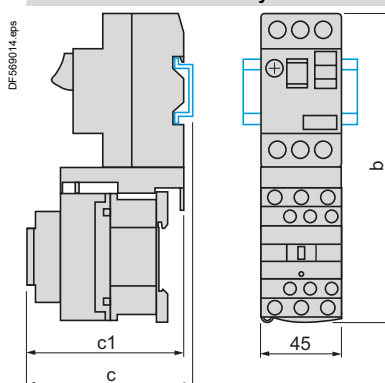
##### GV2AF01

Combination GV2ME + TeSys k contactor

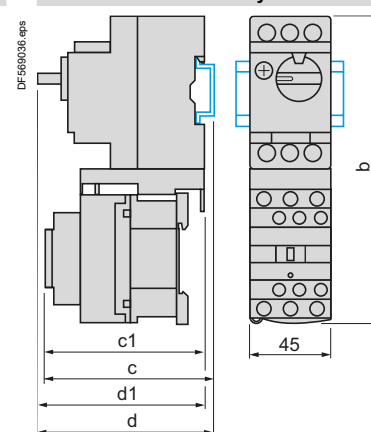


##### GV2AF3

Combination GV2ME + TeSys d contactor



Combination GV2P + TeSys d contactor



GV2ME +	LC1D09 ...D18	LC1D25 and D32
b	176.4	186.8
c1	94.1	100.4
c	99.6	105.9

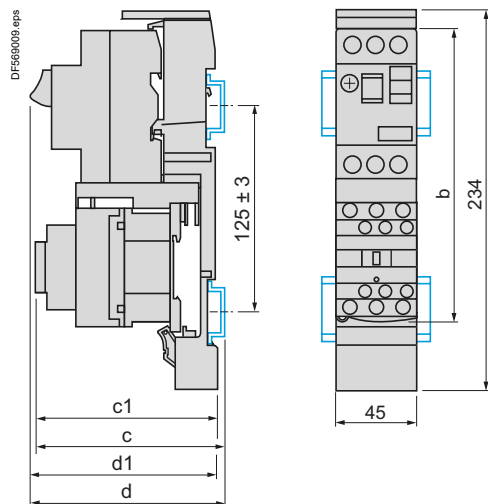
GV2P +	LC1D09 ...D18	LC1D25 and D32
b	176.4	186.8
c1	100.1	106.4
c	105.6	111.9
d1	95	95
d	100.5	100.5



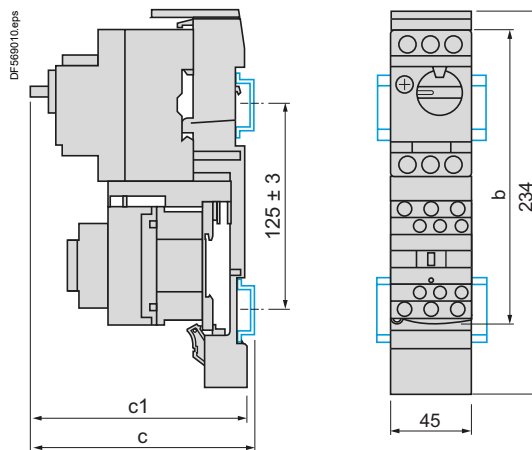
#### Dimensions

##### GV2AF4 + LAD311

##### Combination GV2ME + TeSys d contactor



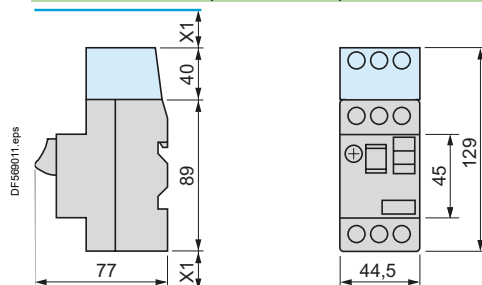
##### Combination GV2P + TeSys d contactor



GV2ME +	LC1D09...D18	LC1D25 and D32
b	176.4	186.8
c1	130.1	136.4
c	135.6	141.9
d1	107	107
d	112.5	112.5

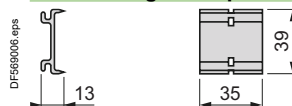
GV2P +	LC1D09...D18	LC1D25 and D32
b	176.4	186.8
c1	136.5	142.4
c	141.6	147.9

##### GV2ME + GV1L3 (current limiter)



X1 = 10 mm for  $U_e = 230\text{ V}$   
or 30 mm for  $230\text{ V} < U_e \leq 690\text{ V}$

##### 7.5 mm height compensation plate GV1F03





### Mounting of external operator GV2APN01, GV2APN02 or GV2APN04 for motor circuit breakers GV2P

DB127415 UPS

60

43

0,5...4

6

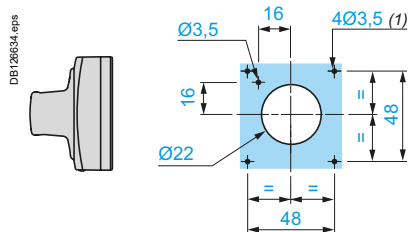
a

6

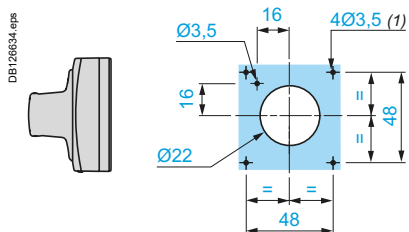
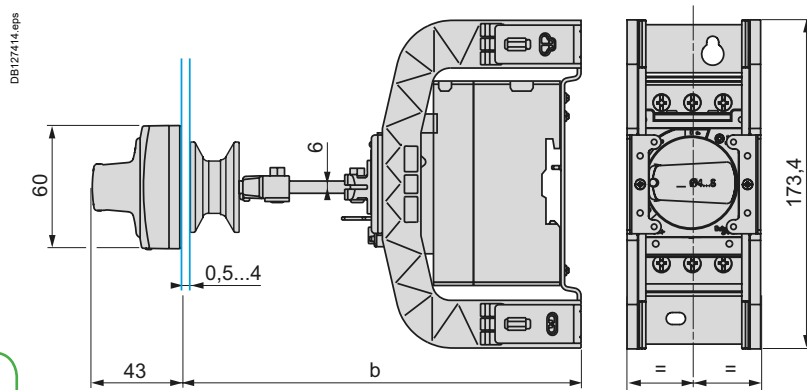
5,2

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### Mounting of external operator GVAPH02 for motor circuit breakers GV2P

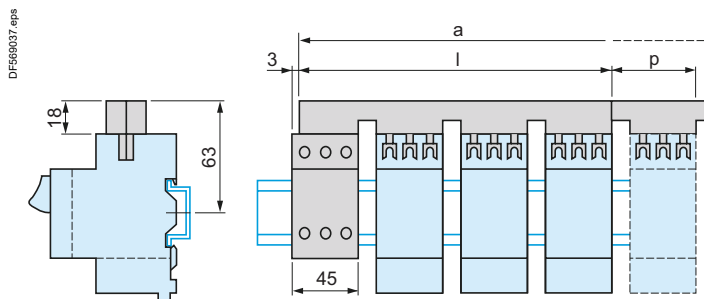


	a		b	
	Mini	Maxi	Mini	Maxi
GV2APN●●	140	250		
GV2APN●● + GVAPH02			151	250
GV2APN●● + GVAPK11	250	434	-	-
GV2APN●● + GVAPH02 + GVAPK11	-	-	250	445



#### GV2ME, GV2P

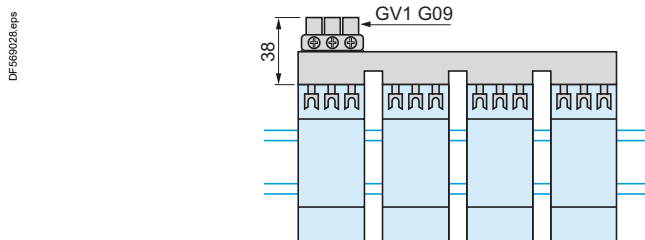
Sets of busbars GV2G445, GV2G454, GV2G472, with terminal block GV2G05



	l	p
GV2G445 (4 x 45 mm)	179	45
GV2G454 (4 x 54 mm)	206	54
GV2G472 (4 x 72 mm)	260	72

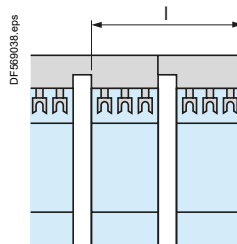
Number of tap-offs	a			
	5	6	7	8
GV2G445	224	269	314	359
GV2G454	260	314	368	422
GV2G472	332	404	476	548

#### Sets of busbars GV2G●●● with terminal block GV1G09

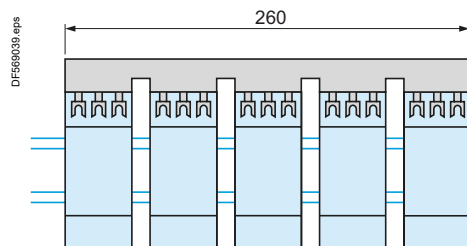


	l
GV2G245 (2 x 45 mm)	89
GV2G254 (2 x 54 mm)	98
GV2G272 (2 x 72 mm)	116

#### Sets of busbars GV2G245, GV2G254, GV2G272

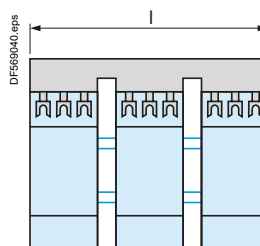


#### Sets of busbars GV2G554



	l
GV2G345 (3 x 45 mm)	134
GV2G354 (3 x 54 mm)	152

#### Sets of busbars GV2G345 and GV2G354





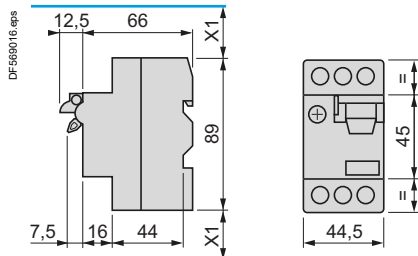
# TeSys

## TeSys GV2RT Thermal-magnetic circuit breakers

### Dimensions and mounting

#### GV2RT

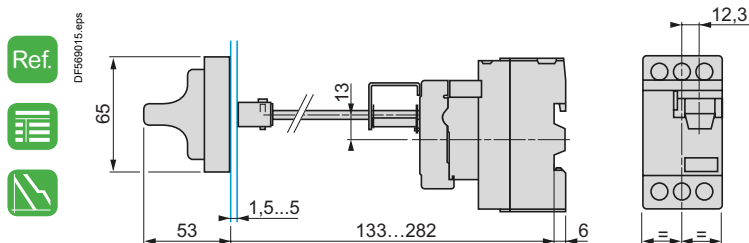
##### Dimensions



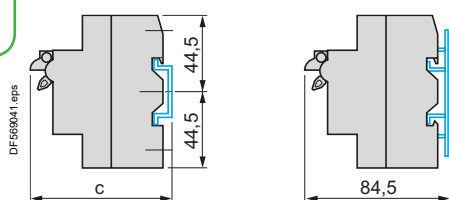
X1: Electrical clearance = 40 mm for  $U_e < 690$  V

##### Mounting

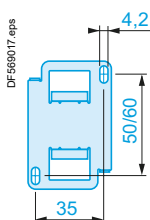
##### Mounting of external operator GV2AP03



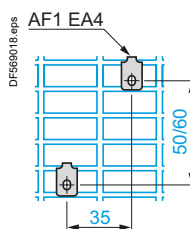
##### On 35 mm rail



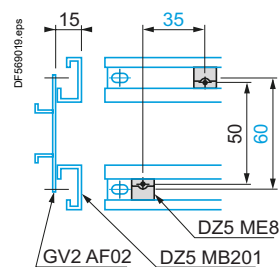
##### On panel with adapter plate GV2AF02



##### On pre-slotted plate AM1PA



##### On rails DZ5MB



$c = 80$  on AM1DP200 (35 x 7.5)  
 $c = 88$  on AM1DE200, ED200 (35 x 15)



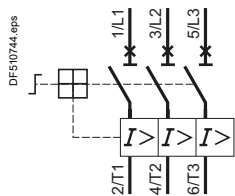
# TeSys

## TeSys GV2 Motor circuit breakers

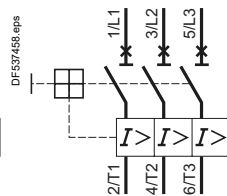
### Schemes

#### Schemes

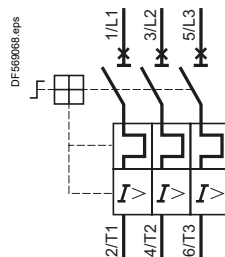
##### GV2L●●



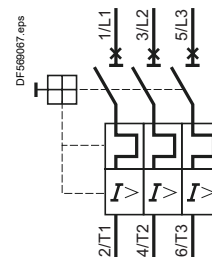
##### GV2LE●●



##### GV2P●●

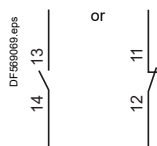


##### GV2ME●● and GV2RT

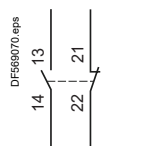


#### Front mounting add-on contact blocks Instantaneous auxiliary contacts

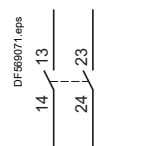
##### GVAE1



##### GVAE11

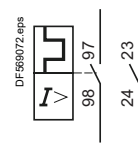


##### GVAE20

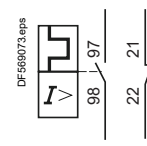


#### Front mounting add-on contact blocks Instantaneous auxiliary contacts and fault signalling contacts

##### GVAED101

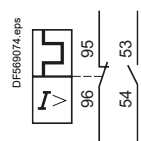


##### GVAED011

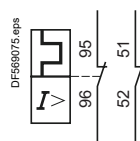


#### Side mounting add-on contact blocks Instantaneous auxiliary contacts and fault signalling contacts

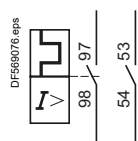
##### GVAD0110



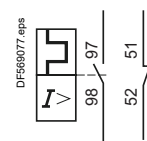
##### GVAD0101



##### GVAD1010

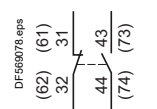


##### GVAD1001

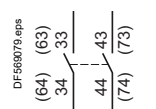


#### Instantaneous auxiliary contacts

##### GVAN11

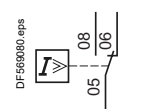


##### GVAN20



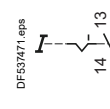
#### Short-circuit signalling contacts

##### GVAM11

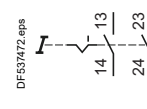


#### Start-Stop signalling contact blocks

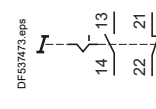
##### GK2AX10



##### GK2AX20

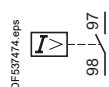


##### GK2AX50

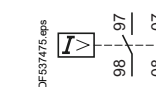


#### Fault signaling contact blocks

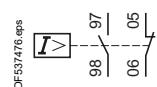
##### GK2AX12



##### GK2AX22



##### GK2AX52



#### Voltage trips

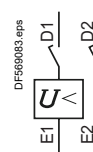
##### GVAU●●●



##### GVAS●●●

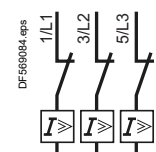


##### GVAX●●●

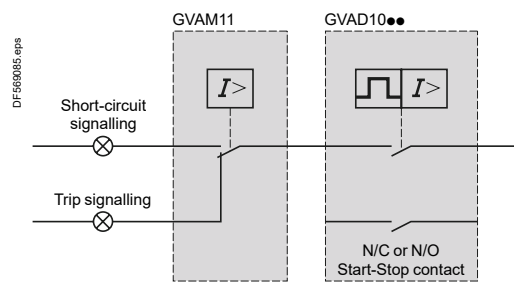


#### Current limiter

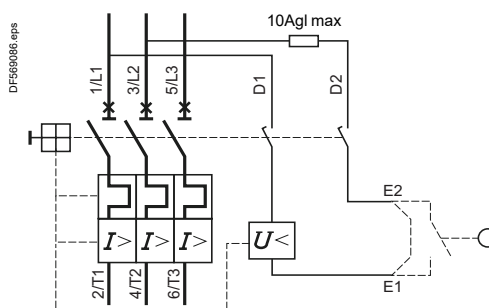
##### GV1L3



#### Use of fault signalling contact and short-circuit signalling contact



#### Connection of undervoltage trip for dangerous machines (conforming to INRS) on GV2ME only





Circuit  
breakers



# TeSys GV3

5 to 45 kW





Ref.



Circuit  
breakers

Environment				
Circuit breaker type			GV3L	GV3P
Conforming to standards			IEC/EN 60947-4-1 IEC/EN 60947-2	IEC/EN 60947-4-1 IEC/EN 60947-2 UL 60947-4-1 CSA C22.2 n° 60947-4-1
Product certifications			CCC, EAC, BV, LROS, DNV-GL, ABS, UL <sup>(1)</sup> , CSA <sup>(2)</sup>	CCC, UL, CSA, EAC, ATEX, BV, LROS, DNV-GL, ABS
Climatic withstand			According to IACS E10	
Degree of protection (front face)	Conforming to IEC 60529	Open mounted In enclosure	Against direct finger contact: IP20	
			-	GV3PC01 and GV3PC02: IP55
Shock resistance	Conforming to IEC 60068-2-27		On: 15 gn -11 ms (On: 5 gn -11 ms for GV3L73, GV3L80, GV3P73, GV3P80) Off: 30 gn -11 ms	
Vibration resistance <sup>(3)</sup>	Conforming to IEC 60068-2-6		4 gn (5...300 Hz)	
Ambient air temperature	Storage		°C	-40...+80
	Operation	Open mounted In enclosure	°C	-20...+60 <sup>(3)</sup>
Temperature compensation		Open mounted In enclosure	°C	-
				-20...+40
Flame resistance	Conforming to IEC 60695-2-11		°C	960
Maximum operating altitude			m	3000
Suitable for isolation	Conforming to IEC 60947-1 § 7-1-6		Yes	-
Resistance to mechanical impact			J	-
				10 IK09 (in enclosure)
Sensitivity to phase failure			Yes, conforming to IEC 60947-4-1 § 8-2-1-5-2 for GV3P	
Technical characteristics				
Circuit breaker type			GV3L	GV3P
Utilisation category	Conforming to IEC 60947-2		A	-
	Conforming to IEC 60947-4-1		-	AC-3
Rated operational voltage (Ue)	Conforming to IEC 60947-2	V	690	
Rated insulation voltage (Ui)	Conforming to IEC 60947-2	V	690	
Rated voltage	Conforming to UL 60947-4-1, CSA C 22.2 n° 60947-4-1	V		600
Rated operational frequency	Conforming to IEC 60947-4-1 UL, CSA	Hz	50/60	
Rated impulse withstand voltage (U imp)	Conforming to IEC 60947-2	kV	6	
Total power dissipated per pole		W	8	
Mechanical durability (C.O.: Close, Open)		C.O.	50 000	
Electrical durability for AC-3 duty	415 V In	C.O.	50 000 (20 000 for GV3L73, GV3P73, GV3L80, GV3P80)	
Duty class (maximum operating rate)		C.O./h	25	
Maximum conventional rated thermal current (Ith)		A	-	13 to 80
Rated duty	Conforming to IEC 60947-4-1			Continuous duty
Operating threshold of magnetic trips			14 I max	

<sup>(1)</sup> For **GV3L25 to 73**, may be followed by 6 or 1.

<sup>(2)</sup> For **GV3L**, **GV3L25 to GV3L73** may be followed by 6 or 1 for use in conjunction with certified overload relay.

<sup>(3)</sup> Leave a space of 9 mm between 2 circuit breakers: either an empty space, or side mounting add-on contact blocks. Side by side mounting is possible up to 40 °C.



# TeSys

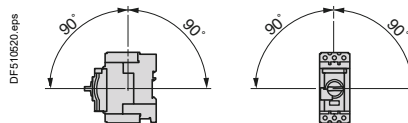
## TeSys GV3 Motor circuit breakers

### Characteristics

#### Mounting characteristics

Operating position

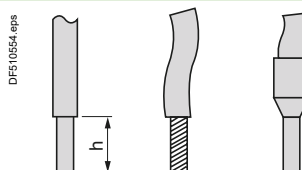
Without derating, in relation to normal vertical mounting plane <sup>(1)</sup>



#### Connection characteristics

##### Connection to screw clamp terminals or spring terminals

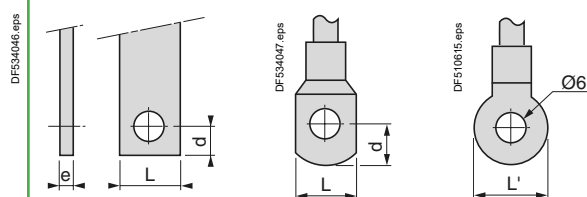
Bare cables



Circuit breaker type		GV3L		GV3P	
Connection to screw clamp terminals <sup>(2)</sup> (Max. number of conductors x c.s.a.)		Min.	Max.	Min.	Max.
Solid cable	mm <sup>2</sup>	2 x 1	1 x 25 and 1 x 35	2 x 1	1 x 25 and 1 x 35
	mm <sup>2</sup>	2 x 1	1 x 25 and 1 x 35	2 x 1	1 x 25 and 1 x 35
	mm <sup>2</sup>	2 x 1	1 x 25 and 1 x 35	2 x 1	1 x 25 and 1 x 35
Tightening torque		N.m	5	5	5

##### Connection by bars or lugs

Bars or lugs



Circuit breaker type		GV3L●●6		GV3P●●6	
Pitch	Without spreaders	mm	17.5		
	With spreaders	mm	—		
Bars or cables with lugs	e	mm	≤ 6		
	L	mm	≤ 13.5		
	L'	mm	≤ 16.5		
	d	mm	≤ 10		
Screws			M6		
	Tightening torque	N.m	6		
Bare cables (copper or aluminium) with connectors	Height (h)	mm	—		
	C.s.a.	mm <sup>2</sup>	—		
	Tightening torque	N.m	—		

<sup>(1)</sup> When mounting on a vertical rail, fit a stop to prevent any slippage.

<sup>(2)</sup> For motor circuit breakers **GV3P**: BTR hexagon socket head screws, **EverLink**® system. Require use of an insulated Allen key, in compliance with local electrical wiring regulations.

<sup>(3)</sup> For cross-sections 1 to 1.5 mm<sup>2</sup>, the use of an **LA9D99** cable end reducer is recommended.



# TeSys

## TeSys GV3L Magnetic circuit breakers

### Characteristics

#### Breaking capacity of GV3L

Type				GV3L25	GV3L32	GV3L40	GV3L50	GV3L65	GV3L73	GV3L80
Breaking capacity of the circuit-breaker only or of the circuit-breaker combined with a thermal overload relay	230/240 V	Icu	kA	100	100	100	100	100	65	65
		Ics % <sup>(1)</sup>		100	100	100	100	100	100	100
	400/415 V	Icu	kA	100	100	50	50	50	50	50
		Ics % <sup>(1)</sup>		100	100	100	100	100	60	60
	440 V	Icu	kA	50	50	50	50	50	50	50
		Ics % <sup>(1)</sup>		100	100	100	100	100	60	60
	500 V	Icu	kA	12	12	12	12	12	12	12
		Ics % <sup>(1)</sup>		50	50	50	50	50	50	50
	690 V	Icu	kA	6	6	6	6	6	6	6
		Ics % <sup>(1)</sup>		50	50	50	50	50	50	50
Associated fuses (if required) for use with circuit breaker only or circuit breaker combined with a thermal overload relay if Isc > breaking capacity	230/240 V	aM	A	★	★	★	★	★	★	★
		gG	A	★	★	★	★	★	★	★
	415 V	aM	A	★	★	★	★	125	125	125
		gG	A	★	★	★	★	160	160	160
	440 V	aM	A	63	80	125	125	125	125	125
		gG	A	80	100	160	160	160	160	160
	500 V	aM	A	63	63	63	63	80	80	80
		gG	A	80	80	80	80	100	100	100
	690 V	aM	A	50	50	50	50	63	63	63
		gG	A	63	63	63	63	80	80	80
Use of circuit breakers without fuses				Minimum cable length (in metres) limiting the maximum short-circuit current to 35 kA maximum.						
Cable c.s.a.			mm <sup>2</sup>	≤ 25	35	50	70	95	- <sup>(2)</sup>	- <sup>(2)</sup>
Isc (rms) 3-phase, incoming (Ue = 415 V)	50 kA	m	5	6	8	10	13	- <sup>(2)</sup>	- <sup>(2)</sup>	
	45 kA	m	5	5	7	8	10	- <sup>(2)</sup>	- <sup>(2)</sup>	
	40 kA	m	5	5	5	5	8	- <sup>(2)</sup>	- <sup>(2)</sup>	
	37 kA	m	5	5	5	5	5	- <sup>(2)</sup>	- <sup>(2)</sup>	

★ Fuse not required: breaking capacity Icn > Isc.

<sup>(1)</sup> As % of Icu.

<sup>(2)</sup> Please consult your Regional Sales Office.



# TeSys

## TeSys GV3P Thermal-magnetic circuit breakers

### Characteristics

Breaking capacity of GV3P											
Motor circuit breaker type				GV3P							
					13	18	25	32	40	50	65
Rating				A	13	18	25	32	40	50	65
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA		100	100	100	100	100	100	100
		Ics % <sup>(1)</sup>			100	100	100	100	100	100	100
	400/415 V	Icu	kA		100	100	100	100	50	50	50
		Ics % <sup>(1)</sup>			100	100	100	100	100	100	60
	440 V	Icu	kA		50	50	50	50	50	50	50
		Ics % <sup>(1)</sup>			100	100	100	100	100	100	60
	500 V	Icu	kA		12	12	12	12	12	12	12
		Ics % <sup>(1)</sup>			50	50	50	50	50	50	50
	690 V	Icu	kA		6	6	6	6	6	6	6
		Ics % <sup>(1)</sup>			50	50	50	50	50	50	50
Associated fuses, if required if Ics > breaking capacity Icu	230/240 V	aM	A		*	*	*	*	*	*	*
		gG	A		*	*	*	*	*	*	*
	415 V	aM	A		*	*	*	*	125	125	125
		gG	A		*	*	*	*	160	160	160
	440 V	aM	A		63	80	125	125	125	125	125
		gG	A		80	100	160	160	160	160	160
	500 V	aM	A		63	63	63	63	80	80	80
		gG	A		80	80	80	80	100	100	100
	690 V	aM	A		50	50	50	50	63	63	63
		gG	A		63	63	63	63	80	80	80

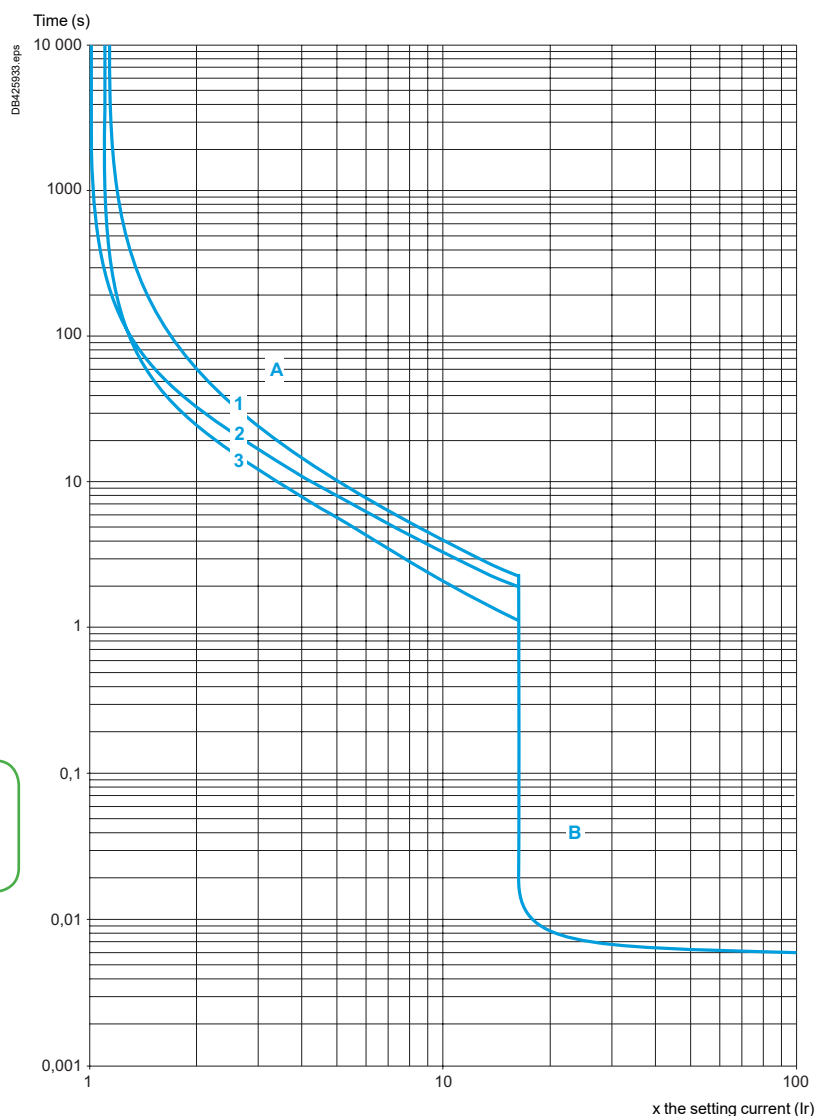
\* Fuse not required: breaking capacity Icn > Isc.

(1) As % of Icu.



#### Tripping curves for GV3L combined with thermal overload relay LRD33

Average operating time at 20 °C without prior current flow



1 3 poles from cold state

2 2 poles from cold state

3 3 poles from hot state

A Thermal overload relay protection zone

B GV3L protection zone



# TeSys

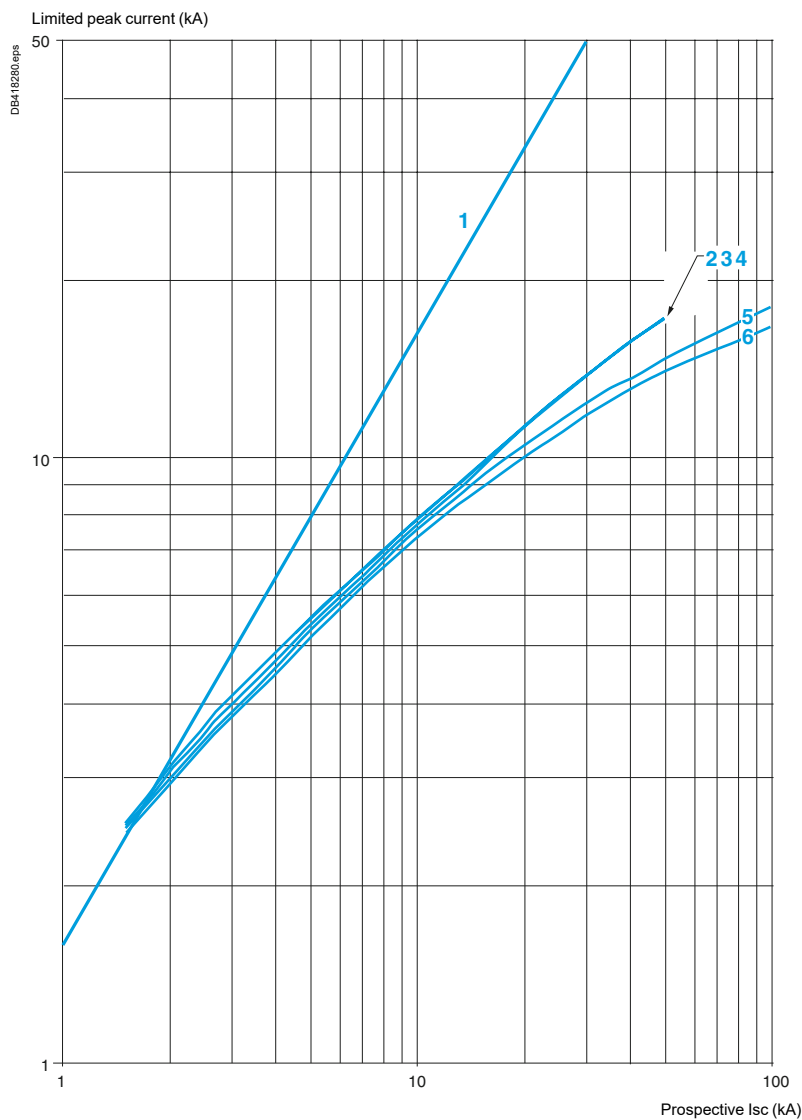
## TeSys GV3L Magnetic circuit breakers

### Curves

#### Current limitation on short-circuit for GV3L (3-phase 400/415 V)

##### Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$



- 1 Maximum peak current
- 2 GV3L80 - GV3L73 - GV3L65
- 3 GV3L50
- 4 GV3L40
- 5 GV3L32
- 6 GV3L25

Ref.



Circuit  
breakers

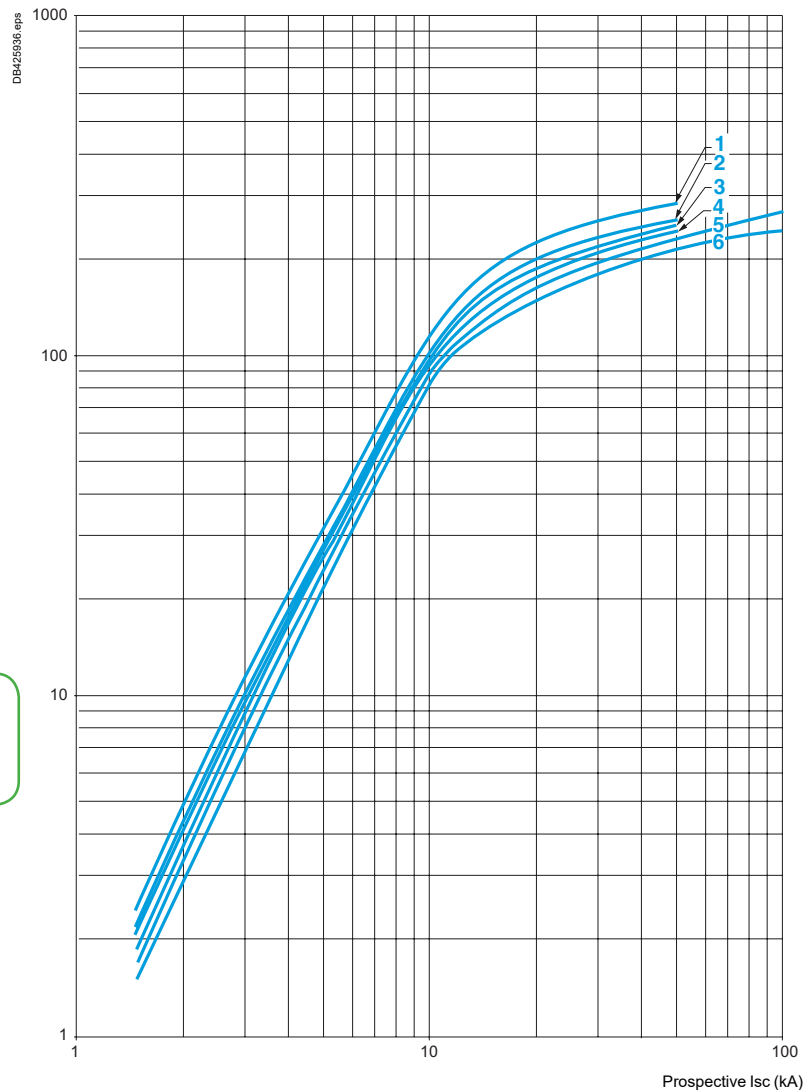


#### Thermal limit on short-circuit for GV3L

##### Thermal limit in A<sup>2</sup>s

Sum of  $I^2dt = f$  (prospective Isc) at 1.05 Ue = 435 V

Sum of  $I^2dt$  (A<sup>2</sup>s)



- 1 GV3L73 - GV3L80
- 2 GV3L65
- 3 GV3L50
- 4 GV3L40
- 5 GV3L32
- 6 GV3L25



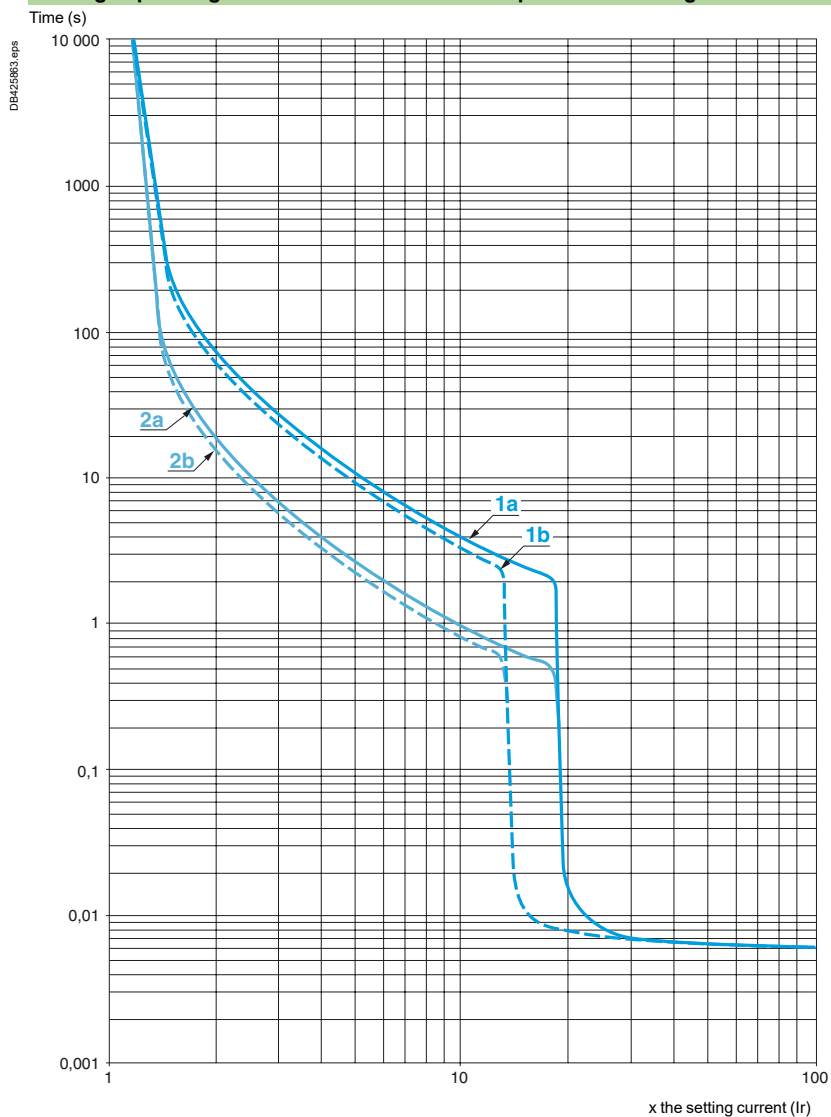
# TeSys

## TeSys GV3P Thermal-magnetic circuit breakers

### Curves

#### Thermal-magnetic tripping curves for GV3P

Average operating times at 20 °C related to multiples of the setting current



- 1a 3 poles from cold state ( $I_r$  mini.): GV3P
- 1b 3 poles from cold state ( $I_r$  maxi.): GV3P
- 2a 3 poles from hot state ( $I_r$  mini.): GV3P
- 2b 3 poles from hot state ( $I_r$  maxi.): GV3P

Ref.



Circuit  
breakers



# TeSys

## TeSys GV3P Thermal-magnetic circuit breakers

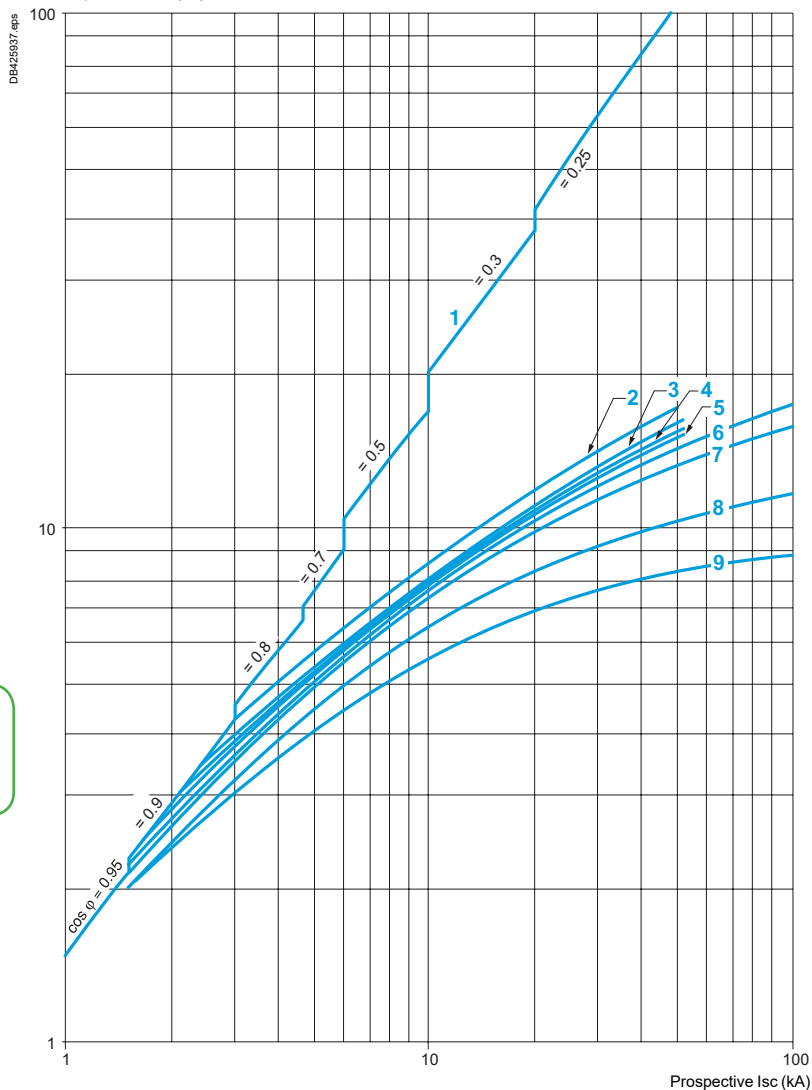
### Curves

#### Current limitation on short-circuit for GV3P (3-phase 400/415 V)

##### Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$

Limited peak current (kA)



- 1 Maximum peak current
- 2 70-80 A (GV3P80); 62-73 A (GV3P73)
- 3 48-65 A (GV3P65)
- 4 37-50 A (GV3P50)
- 5 30-40 A (GV3P40)
- 6 23-32 A (GV3P32)
- 7 17-25 A (GV3P25)
- 8 12-18 A (GV3P18)
- 9 9-13 A (GV3P13)



# TeSys

## TeSys GV3P Thermal-magnetic circuit breakers

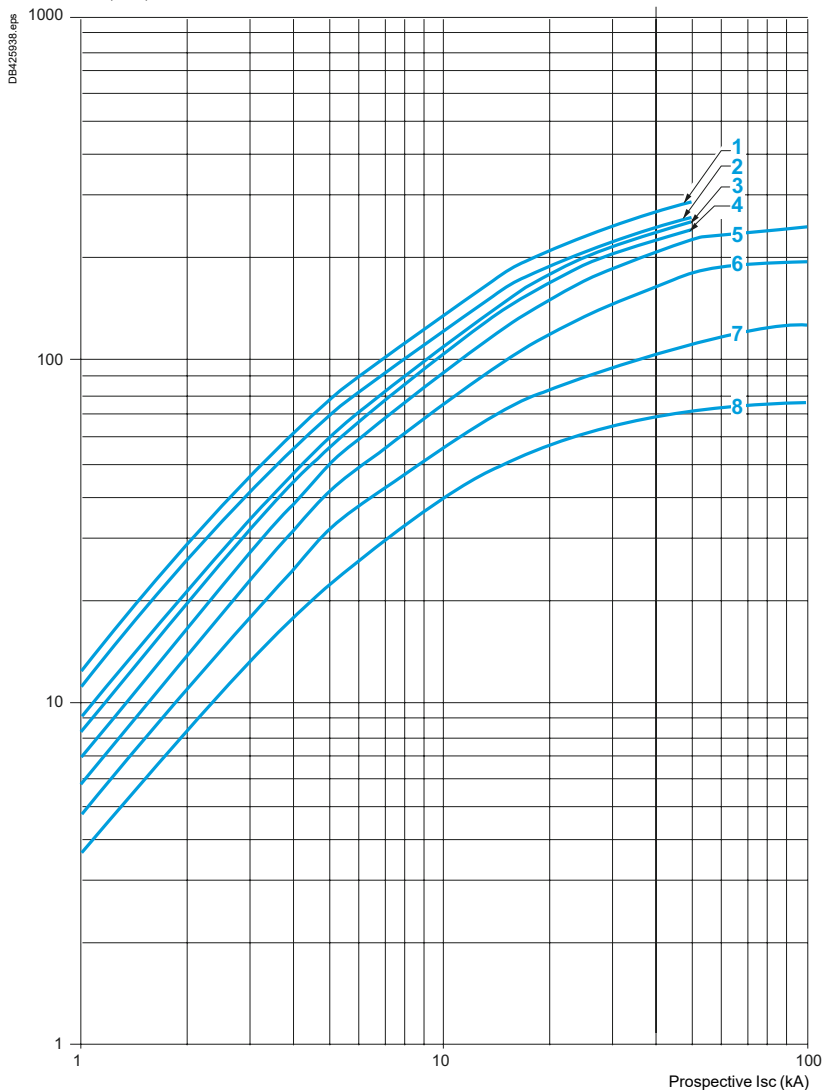
### Curves

#### Maximum thermal limit on short-circuit for GV3P

Thermal limit in  $\text{kA}^2\text{s}$  in the magnetic operating zone

Sum of  $I^2dt = f$  (prospective  $I_{sc}$ ) at  $1.05 U_e = 435 \text{ V}$

Sum of  $I^2dt$  ( $\text{kA}^2\text{s}$ )



- 1 70-80 (GV3P80) - 62-73 (GV3P73)
- 2 48-65 A (GV3P65)
- 3 37-50 A (GV3P50)
- 4 30-40 A (GV3P40)
- 5 23-32 A (GV3P32)
- 6 17-25 A (GV3P25)
- 7 12-18 A (GV3P18)
- 8 9-13 A (GV3P13)

Ref.



Circuit  
breakers



Characteristics of GV3 electric trips				
Type of trip			GVAU●●● MN undervoltage trip	GVAS●●● MX shunt trip
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690	690
	Conforming to CSA C22-2 n°14, UL 508	V	600	600
Operational voltage (Ue)	Conforming to IEC 60947-1	V	0.85...1.1 Uc	0.7...1.1 Uc
Drop-out voltage		V	0.7...0.35 Uc	0.75...0.2 Uc
Inrush consumption	~ ~ ~	VA	12	14
Sealed consumption	~ ~ ~	VA	3.5	5
Operating time	Conforming to IEC 60947-1	ms	From the moment the voltage reaches its operational value until opening of the circuit breaker.	
On-load factor			100 %	
Cabling (spring connection)	Number of conductors		2 or 4	
	Solid cable	mm²	1...2.5	
	Flexible cable without cable end	mm² AWG	0.75...2.5	
	Flexible cable with cable end	mm²	0.75...2.5	
Tightening torque		N.m	1.4 max	
Mechanical durability (C.O.: Close - Open)		C.O.	10000 (GV3P and GV3L)	

Ref.

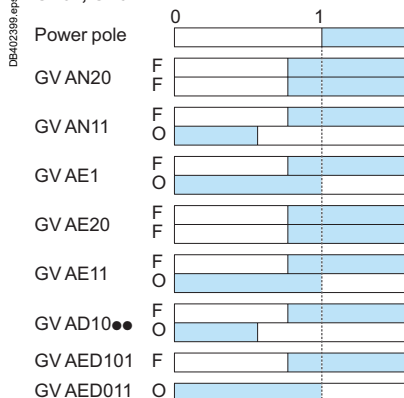




Type of contacts			Instantaneous auxiliary GVAN, GVAD								Fault signalling GVAD, GVAM11 <sup>(1)</sup>				Instantaneous auxiliary GVAE			
Rated insulation voltage (Ui) (associated insulation coordination)	Conforming to IEC 60947-1	V	690								690				250 (690 in relation to main circuit)			
	Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1	V	600								300				300			
Conventional thermal current (Ith)	Conforming to IEC 60947-5-1	A	6								2.5				2.5			
	Conforming to UL 60947-5-1, CSA C22.2 n° 60947-5-1	A	5								1				1			
Mechanical durability (C.O.: Close - Open)		C.O.	100 000								1000				100 000			
Operational power and current conforming to IEC 60947-5-1. a.c. operation			AC-15/100 000 C.O.								AC-14/1000 C.O.				AC-15/100 000 C.O.			
	Rated operational voltage (Ue)	V	48	110 127	230 240	380 415	440	500	690	24	48	110 127	230 240	24	48	110 127	230 240	
Operation	Operational power, normal conditions	VA	300	500	720	850	650	500	400	36	48	72	72	48	60	120	120	
	Occasional breaking and making capacities, abnormal conditions	kVA	3	7	13	15	13	12	9	0.22	0.3	0.45	0.45	0.48	0.6	1.27	2.4	
	Rated operational current (Ie)	A	6	4.5	3.3	2.2	1.5	1	0.6	1.5	1	0.5	0.3	2	1.25	1	0.5	
Operational power and current conforming to IEC 60947-5-1. d.c.			DC-13/100 000 C.O.								DC-13/1000 C.O.				DC-13/100 000 C.O.			
	Rated operational voltage (Ue)	V	24	48	60	110	240 (2)	—	—	24	48	60	—	24	48	60	—	
Operation	Operational power, normal conditions	W	140	240	180	140	120	—	—	24	15	9	—	24	15	9	—	
	Occasional breaking and making capacities, abnormal conditions	W	240	360	240	210	180	—	—	100	50	50	—	100	50	50	—	
	Rated operational current (Ie)	A	6	5	3	1.3	0.5	—	—	1	0.3	0.15	—	1	0.3	0.15	—	
Low power switching reliability of contact			GVAE: Number of failures for “n” million operating cycles (17 V-5 mA): = 10 <sup>-6</sup>															
Minimum operational conditions d.c. operation		V	17															
		mA	5															
Short-circuit protection			By GB2CB●● circuit breaker (rating according to operational current for Ue ≤ 415 V) or by gG fuse 10 A max												GB2CB06 or gG fuse 10 A max			
Cabling, screw clamp terminals	Number of conductors		1				2											
	Solid cable	mm <sup>2</sup>	1...2.5				1...2.5											
	Flexible cable without cable end	mm <sup>2</sup>	0.75...2.5				0.75...2.5											
	Flexible cable with cable end	mm <sup>2</sup>	0.75...1.5				0.75...1.5											
	Tightening torque	N.m	1.4 max				1.4 max											
Cabling, spring terminal connections	Flexible cable without cable end	mm <sup>2</sup>	GVAN only 0.75...2.5				0.75...2.5				—				0.75...1.5			

## Operation of instantaneous auxiliary contacts

## GV3P, GV3L



## Operation of fault signalling contacts

## GVAM11

Change of state following tripping on  
short-circuit.

## GVAD10●● and GVAD01●●

Change of state following tripping on  
short-circuit, overload or undervoltage.

(1) For application example of fault signalling contact and short-circuit signalling contact.

(2) Add an RC circuit type LA4D to the load terminals.



TeSys

TeSys GV - 3-pole busbar for GV3 circuit breakers

Characteristics

Characteristics of 3-pole busbars GV3G●●●			
Rated insulation voltage (Ui)		Conforming to IEC 60947-1	
		V	GV3G●64 690
Conventional thermal current (Ith)		Conforming to IEC 60439-1	
		A	115
Rated operational current (Ie)			A
			115
Permissible peak current (I peak)			kA
			20
Permissible thermal limit (I²t)			kA²s
			300
Degree of protection		Conforming to IEC 60529	
			IP 20
Terminal block			—

Ref.



Circuit breakers



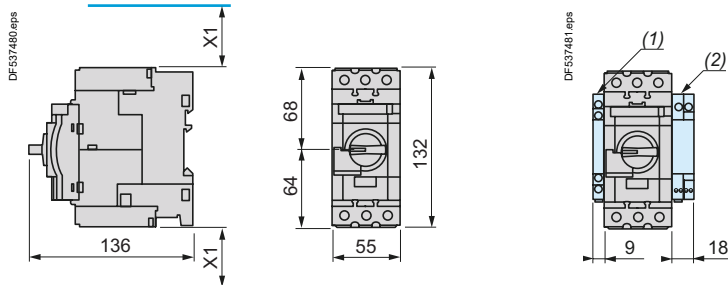
# TeSys

## TeSys GV3 Motor circuit breakers

### Dimensions and mounting

#### GV3L, GV3P

##### Dimensions



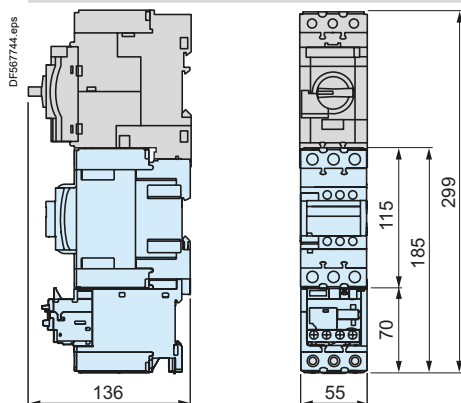
X1 = Electrical clearance (ISC max)  
40 mm for  $U_e \leq 500$  V, 50 mm for  $U_e \leq 690$  V

(1) Blocks **GVAN●●**, **GVAD●●** and **GVAM11**.  
(2) Blocks **GV3AU●●** and **GV3AS●●**.

**Note:** Leave a space of 9 mm between 2 circuit breakers: either an empty space or side-mounting add-on contact blocks.  
Side by side mounting is possible up to 40 °C.

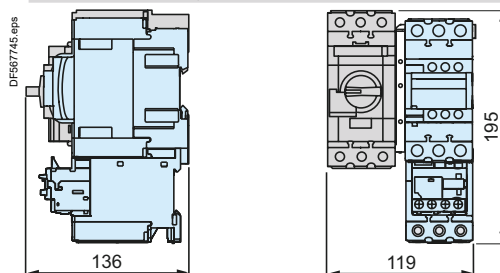
##### Mounting

Mounting with TeSys contactor LC1D40A...D80A and relay LR3D313...380 <sup>(1) (2) (3)</sup>

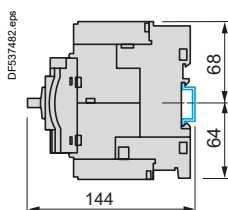


(1) Mountings with c.b. up to **GV3L73**, **GV3P73**.  
(2) For **GV3L80**, **GV3P80** use cable between components for dissipating heat. Consult online datasheets for values  
(3) S-shape busbar system suitable up to 73 A.

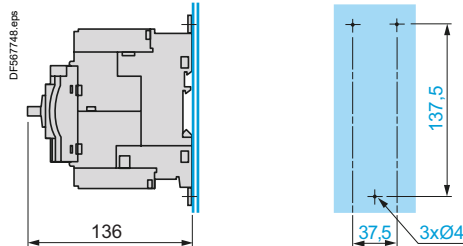
Side by side mounting with TeSys contactor LC1D40A...D73A (S-shape busbar system GV3S <sup>(1)</sup>)



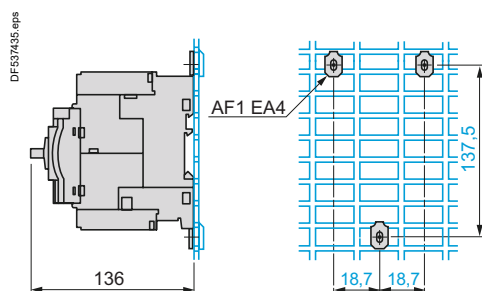
Mounting on rail AM1DE200 or AM1ED201



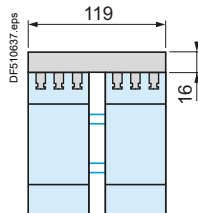
Panel mounting, using M4 screws



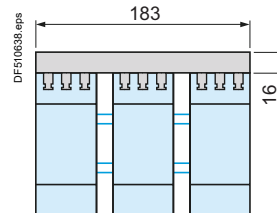
Mounting on pre-slotted plate AM1PA



Set of busbars GV3G264



Set of busbars GV3G364



References:  
pages B6/26 and B6/27

Characteristics:  
pages B6/94 to B6/97

Curves:  
pages B6/98 to B6/103

Schemes:  
page B6/109

Life Is On

Schneider  
Electric

B6/107

Ref.

Ref.

Ref.

Ref.

Circuit  
breakers



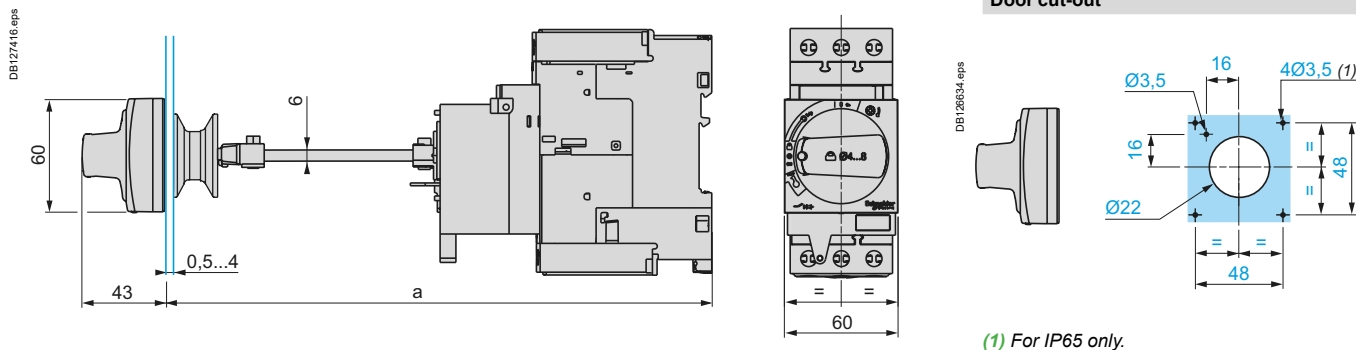
# TeSys

## TeSys GV3 Motor circuit breakers

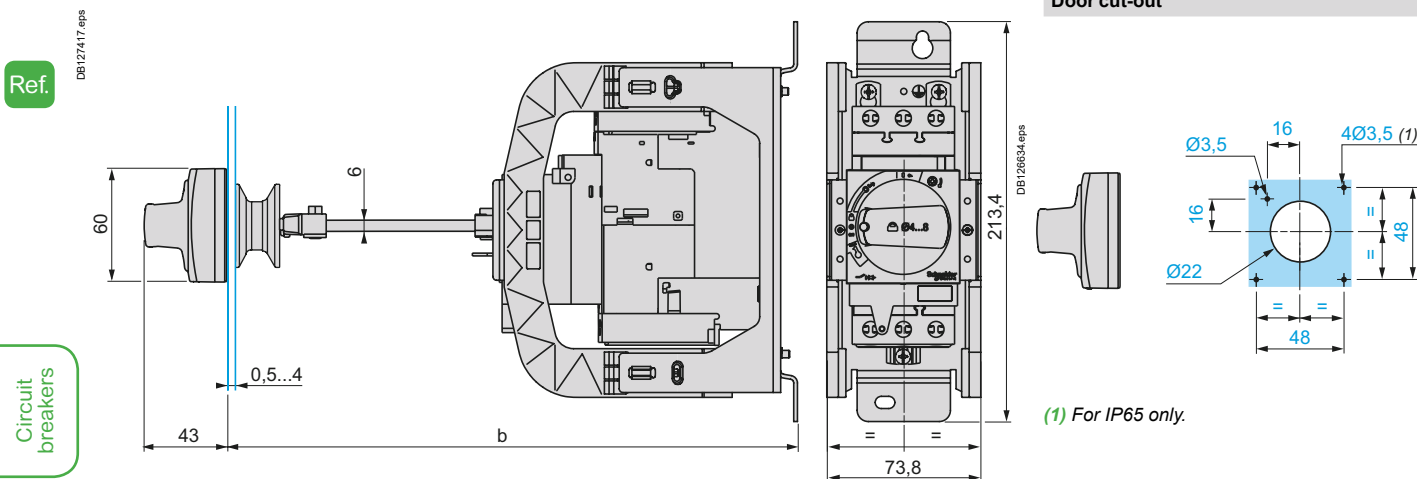
### Dimensions and mounting

#### Mounting

##### Mounting of external operator GV3APN01, GV3APN02 or GV3APN04 for motor circuit breakers GV3L



##### Mounting of external operator GVAPH03 for motor circuit breakers GV3L

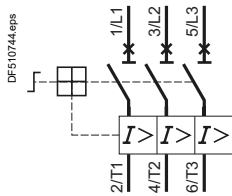


	a		b	
	Mini	Maxi	Mini	Maxi
GV3APN●●	189	300	-	-
GV3APN●● + GVAPK12	300	481	-	-
GV3APN●● + GVAPH03	-	-	200	300
GV3APN●● + GVAPH03 + GVAPK12	-	-	300	492

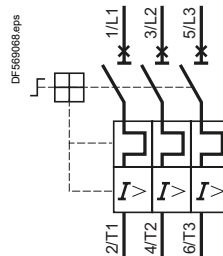


## Schemes

### GV3L●●

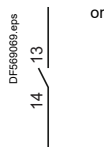


### GV3P●●

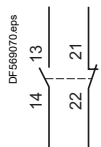


### Front mounting add-on contact blocks Instantaneous auxiliary contacts

#### GVAE1



#### GVAE11

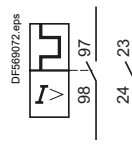


#### GVAE20

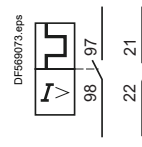


### Front mounting add-on contact blocks Instantaneous auxiliary contacts and fault signalling contacts

#### GVAED101

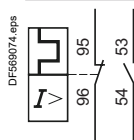


#### GVAED011

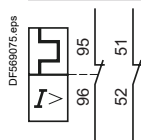


### Side mounting add-on contact blocks Instantaneous auxiliary contacts and fault signalling contacts

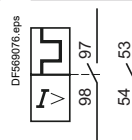
#### GVAD0110



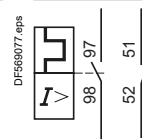
#### GVAD0101



#### GVAD1010

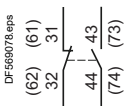


#### GVAD1001

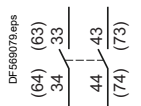


### Instantaneous auxiliary contacts

#### GVAN11

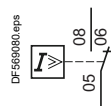


#### GVAN20



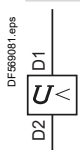
### Short-circuit signalling contacts

#### GVAM11

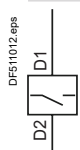


### Voltage trips

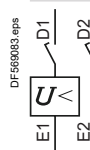
#### GVAU●●●



#### GVAS●●●

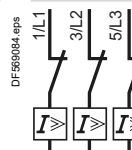


#### GVAX●●●

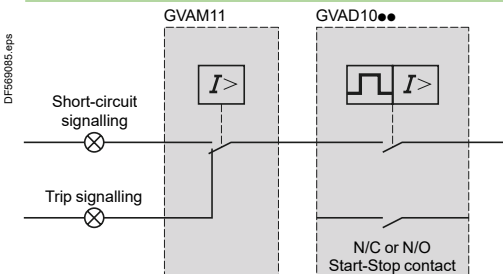


### Current limiter

#### GV1L3

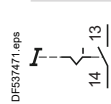


### Use of fault signalling contact and short-circuit signalling contact

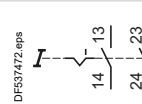


### Start-Stop signalling contact blocks

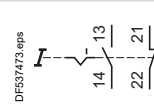
#### GK2AX10



#### GK2AX20

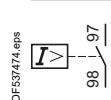


#### GK2AX50

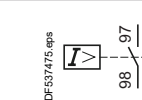


### Fault signalling contact blocks

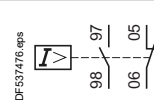
#### GK2AX12



#### GK2AX22



#### GK2AX52





Circuit  
breakers

B6/110

Life | s On

**Schneider**  
Electric



# TeSys GV4

0.25 to 55 kW - 1/2 to 60 HP



Circuit  
breakers



# TeSys

## TeSys GV4 Motor circuit breakers

### Characteristics

Environment									
Circuit breaker type				GV4L	GV4LE	GV4P	GV4PE	GV4PEM	GV4PB
Conforming to standards				IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1		IEC/EN 60947-1, IEC/EN 60947-2, IEC/EN 60947-4-1, UL 60497-4-1, CSA 22.2 n° 60497-4-1			IEC/EN 60947-2, IEC/ EN 60947-4-1
Product certifications				CCC, EAC, BV, EU-RO MR <sup>(1)</sup>		CCC, EAC, CSA (cCSAus), ATEX, BV, EU-RO MR <sup>(1)</sup>			UL 489, CSA C22.2 n°5
Climatic withstand				According to IACS E10					
Degree of protection (front face)	Conforming to IEC 60529	Open mounted		IP 40 front face except on connection area. Connection area: - IP20 with EverLink connector - IP40 with crimp lug connector and terminal shield.					
		In enclosure <sup>(2)</sup>		DRH = IP40 ERH = IP54 or IP65					
Shock resistance	Conforming to IEC 60068-2-27			15g - 11 ms		15g - 11 ms			
Vibration resistance	Conforming to IEC 60068-2-6			2.0 to 13.2 Hz and amplitude ±1 mm 13.2 to 100 Hz acceleration 0.7 g					
Ambient air temperature	Storage		°C	-50...+85					
	Operation		°C	-25...+70					
Temperature compensation			°C	Non applicable		-25...+60 <sup>(3)</sup>			
Flame resistance	Conforming to IEC 60695-2-11		°C	960					
Maximum operating altitude			m	2000 without derating. Up to 5000 with derating					
Suitable for isolation	Conforming to IEC 60947-1 § 7-1-6			Yes					
Resistance to mechanical impact			J	IK07 (2J)					
Sensitivity to phase failure				No		Yes			
Technical characteristics									
Utilisation category	Conforming to IEC 60947-2			A		A			
	Conforming to IEC 60947-4-1			AC-3 <sup>(4)</sup>					
Rated operational voltage (Ue)	Conforming to IEC 60947-2		V	690					
Rated insulation voltage (Ui)	Conforming to IEC 60947-2		V	800					
Rated voltage	Conforming to CSA C22-2 n°1, UL 60947-4-1		V	Non applicable		600			
Rated operational frequency	Conforming to IEC 60947-4-1, UL, CSA		Hz	50/60					
Rated impulse withstand voltage (U imp)	Conforming to IEC 60947-2		kV	8					
Total power dissipated per pole			W	6.1		4.6			
Mechanical durability (C.O.: Closing, Opening)			C.O.	40000					
Electrical durability for AC-3/415V duty (C.O.: Closing, Opening)	415 V In		C.O.	5 000					
Duty class (maximum operating rate)			C.O./h	25					
Maximum conventional rated thermal current (Ith)			A	115					
Rated duty				Continuous duty					

(1) Refer to chapter on page A6/39 for details on Marine Classification Societies.

(2) DRH = with Direct Rotary Handle

ERH = with Extended Rotary Handle.

(3) For operation up to 70 °C, please consult your regional sales office.

(4) Up to 100 A.



# TeSys

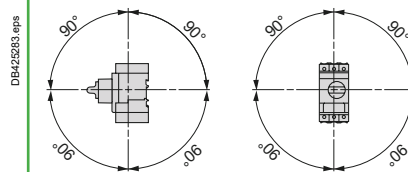
## TeSys GV4 Motor circuit breakers

### Characteristics

#### Mounting characteristics

Operating position

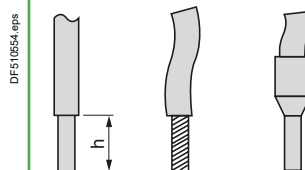
Without derating, in relation to normal vertical mounting plane <sup>(1)</sup>



#### Power connection characteristics

##### Power connection by bare cables (EverLink connector)

Bare cables



Connection to screw clamp terminals (Max. number of conductors x c.s.a.)

Solid cable

**mm<sup>2</sup>**  
**AWG**

**Min.**  
Cu 1 x 1.5 + 1 x 2.5  
Cu 2 x 14

**Max.**

Cu 1 x 70 + 1 x 95  
Cu 1 x 2/0 + 1 x 3/0

Flexible cable without cable end

**mm<sup>2</sup>**  
**AWG**

Cu 1 x 1.5 + 1 x 2.5  
Cu 2 x 6

Cu 1 x 50 + 1 x 70  
Cu 1 x 1/0 + 1 x 2/0

Flexible cable with cable end

**mm<sup>2</sup>**  
**AWG**

Cu 1 x 1.5 + 1 x 2.5  
Cu 2 x 6

Cu 1 x 50 + 1 x 70  
Cu 1 x 1/0 + 1 x 2/0

Tightening torque

**N.m**

5 ≤ 10 mm<sup>2</sup> / 8 AWG  
9 ≥ 16 mm<sup>2</sup> / 6 AWG

Stripping length (h)

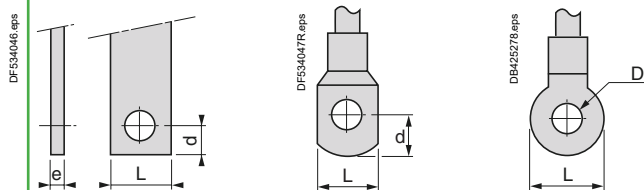
Solid cable

**mm**

20

##### Power connection by bars or lugs

Bars or lugs



Pitch

Without spreaders

**mm**

27

With spreaders

**mm**

35

Bars or cables with lugs

e

**mm**

≤ 8

L

**mm**

≤ 20

d

**mm**

≤ 7

D

**mm**

6.4

M6 Screws

Tightening torque

**N.m**

5 ≤ 10 mm<sup>2</sup> / 8 AWG  
9 ≥ 16 mm<sup>2</sup> / 6 AWG

<sup>(1)</sup> When mounting on a vertical rail, fit a stop to prevent any slippage.



TeSys

TeSys GV4L, GV4LE Magnetic circuit breakers

Characteristics

Breaking capacity of GV4L and GV4LE																							
Circuit breaker type				GV4L●●●B GV4LE●●●B				GV4L●●●N GV4LE●●●N								GV4LE●●●S							
Rating			A	25	50	80	115	2	3.5	7	12.5	25	50	80	115	2	3.5	7	12.5	25	50	80	115
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	50				100								120							
		Ics % <sup>(1)</sup>		100				100								100							
	400/415 V	Icu	kA	25				50								100							
		Ics % <sup>(1)</sup>		100				100								100							
	440 V	Icu	kA	20				50								70							
		Ics % <sup>(1)</sup>		100				100								100							
	500 V	Icu	kA	10				25								30							
		Ics % <sup>(1)</sup>		100				100								100							
	525 V	Icu	kA	-				15								18							
		Ics % <sup>(1)</sup>		-				100								100							
	690 V	Icu	kA	-				8								10							
		Ics % <sup>(1)</sup>		-				25								25							

(1) As % of Icu.





Breaking capacity of GV4P, GV4PE, GV4PB●●●B																							
Circuit breaker type				GV4P●●●B GV4PE●●●B GV4PEM●●●B GV4PB●●●B					GV4P●●●N GV4PE●●●N GV4PEM●●●N GV4PB●●●N								GV4P●●●S GV4PE●●●S GV4PEM●●●S GV4PB●●●S						
Rating			A	25	50	80	115	2	3.5	7	12.5	25	50	80	115	2	3.5	7	12.5	25	50	80	115
Breaking capacity conforming to IEC 60947-2	230/240 V	Icu	kA	50				100								120							
		Ics % <sup>(1)</sup>		100				100								100							
	400/415 V	Icu	kA	25				50								100							
		Ics % <sup>(1)</sup>		100				100								100							
	440 V	Icu	kA	20				50								70							
		Ics % <sup>(1)</sup>		100				100								100							
	500 V	Icu	kA	10				25								30							
		Ics % <sup>(1)</sup>		100				100								100							
	525 V	Icu	kA	-				15								18							
		Ics % <sup>(1)</sup>		-				100								100							
	690 V	Icu	kA	-				8								10							
		Ics % <sup>(1)</sup>		-				25								25							
Breaking capacity conforming to UL 60947-4-1 and CSA 22.2 n° 60947-4-1	120 V		kA	35				65								100							
	208 V		kA	35				65								100							
	240 V		kA	35				65								100							
	480Y / 277 V		kA	18				35								65							
	480 V <sup>(2)</sup>		kA	18				35								65							
	600Y / 347 V		kA	14				18								25							
	600 V <sup>(2)</sup>		kA	14				18								25							

<sup>(1)</sup> As % of Icu.<sup>(2)</sup> Except for MCC suitable for TAP conductor protection, in motor group installation and GV4PB.

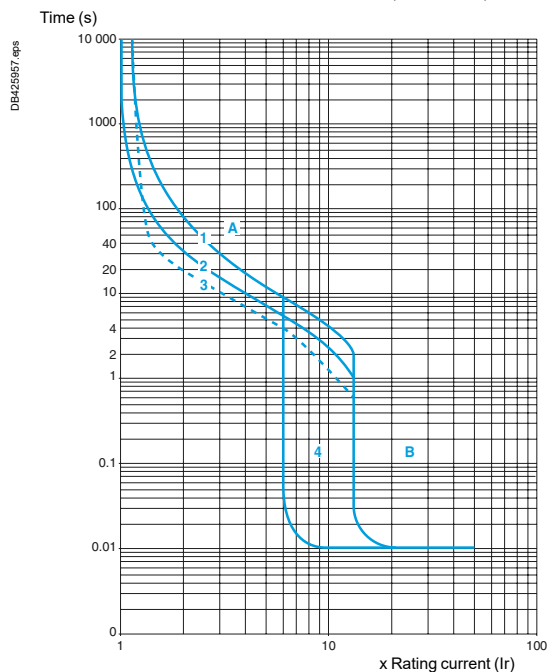
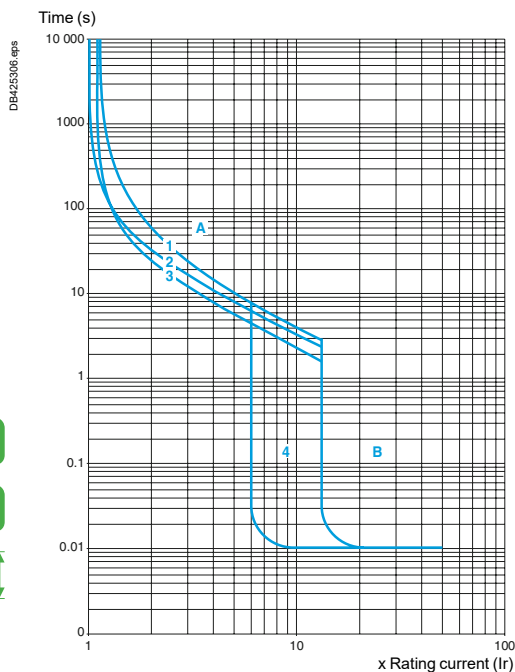


#### Tripping curves for GV4L and GV4LE combined with thermal overload relay LRD or LR9

Average operating times at 20 °C related to multiples of the setting current

GV4L02 and GV4LE02 to 12 with LRD05 to LRD14,  
GV4L80 and GV4LE80 with LRD3363

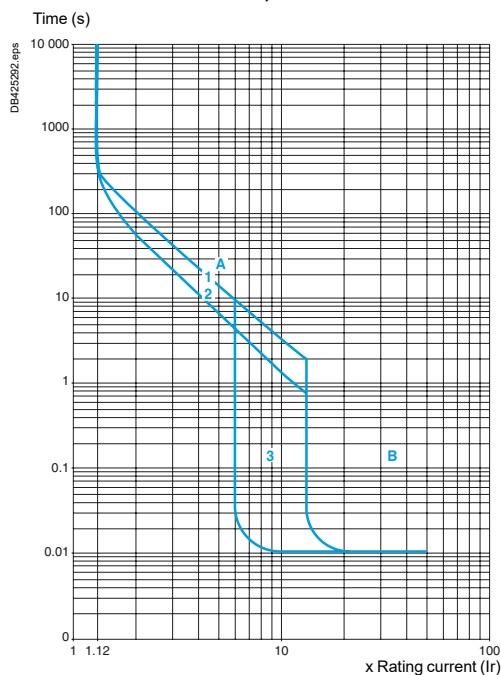
GV4L25 AND GV4LE25 with LRD318, LRD325  
GV4L50 AND GV4LE50 with LRD332, LRD340, LRD350



- 1 3 poles from cold state
  - 2 2 poles from cold state
  - 3 3 poles from hot state
  - 4 6 ... 14 Ir
- A Thermal overload relay protection zone
  - B GV4L protection zone

- 1 3 poles from cold state
  - 2 2 poles from cold state
  - 3 3 poles from hot state
  - 4 6 ... 14 Ir
- A Thermal overload relay protection zone
  - B GV4L protection zone

GV4L115 and GV4LE115 with class 10 LR9F5367, LR9D5369  
and class 20 LR9D5567, LR9F5569



- 1 Cold state curve
- 2 Hot state curve
- 3 6 ... 14 Ir



# TeSys

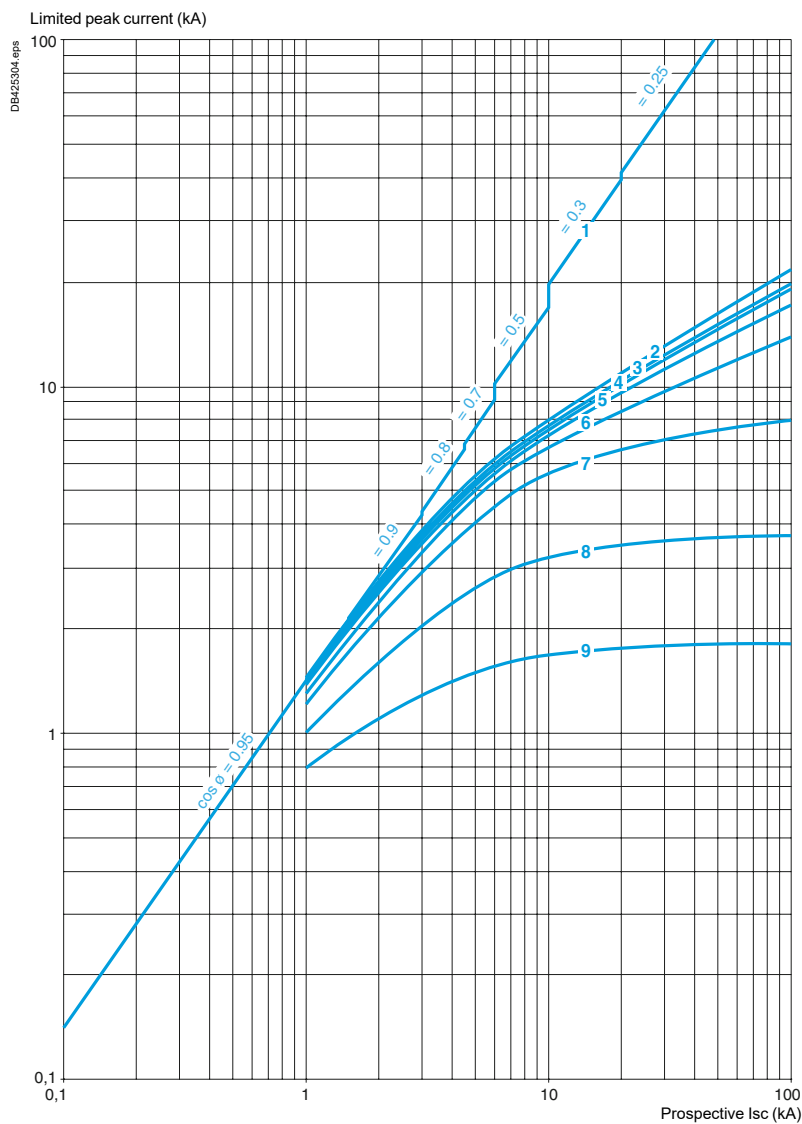
## TeSys GV4L, GV4LE Magnetic circuit breakers

### Curves

#### Current limitation on short-circuit for GV4L, GV4LE (3-phase 400/415 V)

##### Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$



- 1 Maximum peak current
- 2 GV4L115
- 3 GV4L80
- 4 GV4L50
- 5 GV4L25
- 6 GV4L12
- 7 GV4L07
- 8 GV4L03
- 9 GV4L02



# TeSys

## TeSys GV4L, GV4LE Magnetic circuit breakers

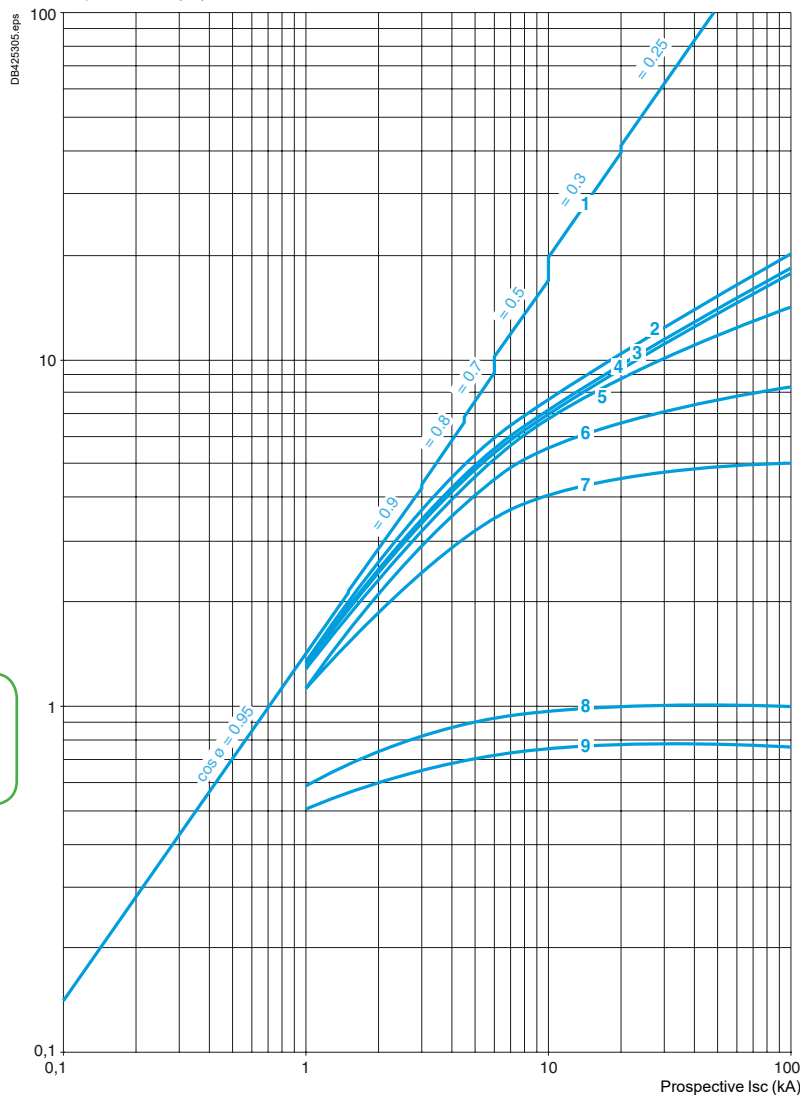
### Curves

**Current limitation on short-circuit for GV4L, GV4LE + thermal overload relay LRD or LR9 (3-phase 400/415 V)**

#### Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$

Limited peak current (kA)



- 1 Maximum peak current
- 2 GV4L115 + LR9D5367 or LR9F5367
- 3 GV4L80 + LRD3361
- 4 GV4L50 + LRD340
- 5 GV4L25 + LRD325
- 6 GV4L12 + LRD313
- 7 GV4L07 + LRD12
- 8 GV4L03 + LRD07
- 9 GV4L02 + LRD07



# TeSys

## TeSys GV4L, GV4LE Magnetic circuit breakers

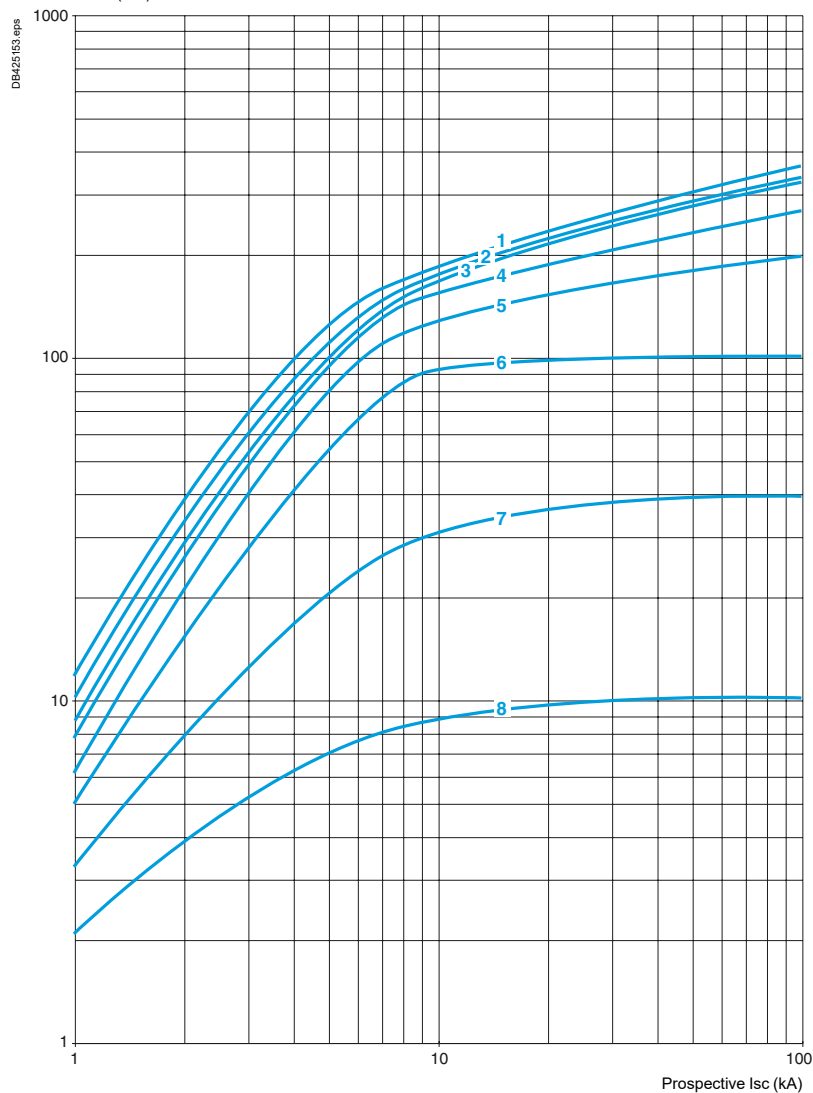
### Curves

#### Thermal limit on short-circuit for GV4L, GV4LE

##### Thermal limit in A²s

Sum of  $I^2dt = f$  (prospective  $I_{sc}$ ) at 1.05  $U_e = 435$  V

Sum of  $I^2dt$  (A²s)



- 1 GV4L115
- 2 GV4L80
- 3 GV4L50
- 4 GV4L25
- 5 GV4L12
- 6 GV4L07
- 7 GV4L03
- 8 GV4L02



# TeSys

## TeSys GV4L, GV4LE Magnetic circuit breakers

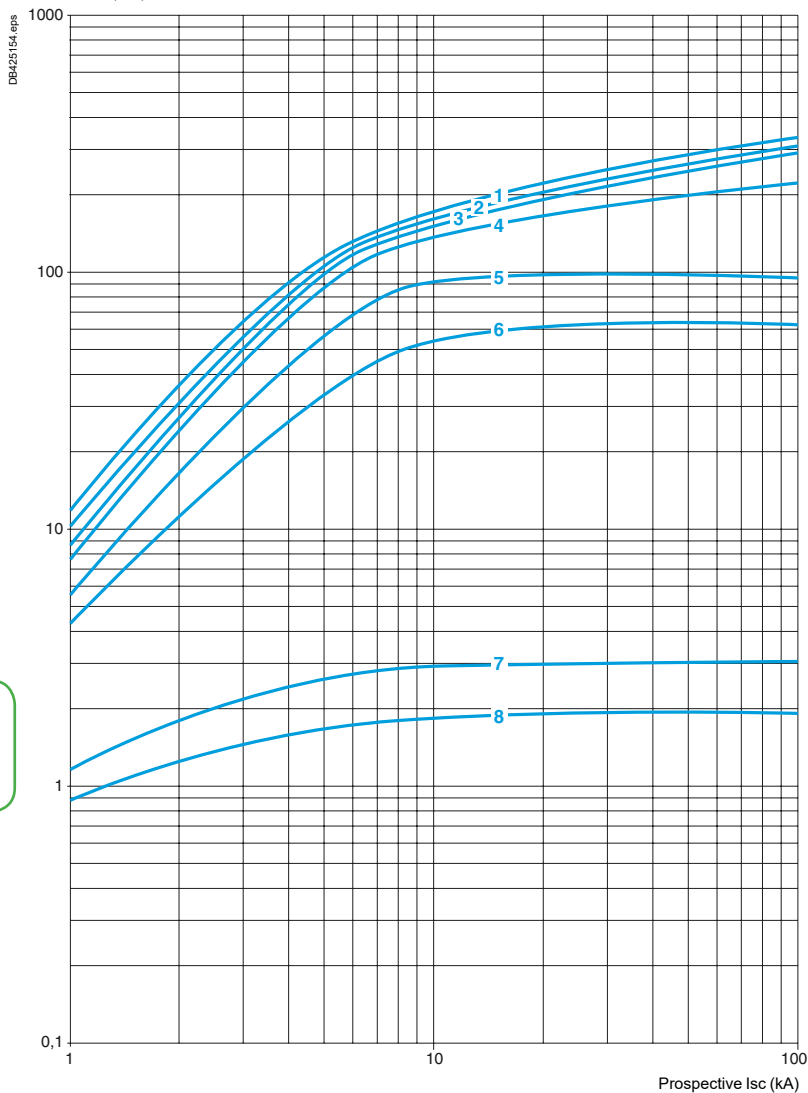
### Curves

#### Thermal limit on short-circuit for GV4L, GV4LE + thermal overload relay LRD or LR9

##### Thermal limit in kA in the magnetic operating zone

Sum of  $I^2dt = f$  (prospective  $I_{sc}$ ) at  $1.05 U_e = 435 V$

Sum of  $I^2dt$  (A<sup>2</sup>s)



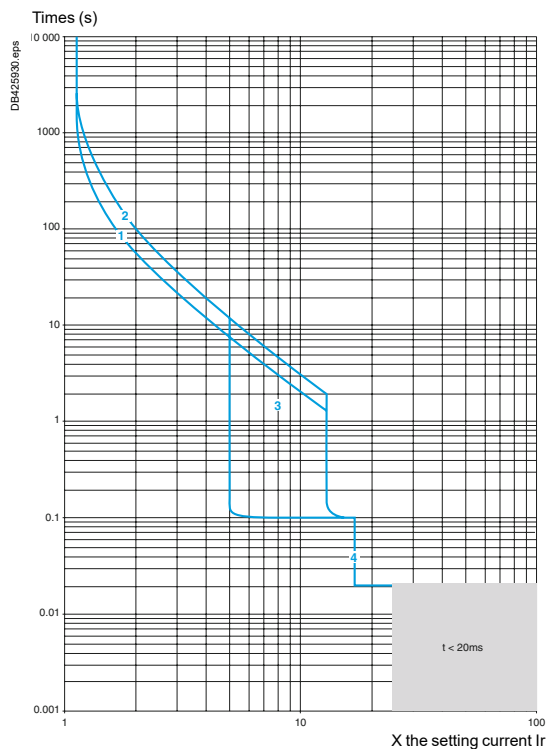
- 1 GV4L115 + LR9D5367 or LR9F5367
- 2 GV4L80 + LRD3361
- 3 GV4L50 + LRD340
- 4 GV4L25 + LRD325
- 5 GV4L12 + LRD313
- 6 GV4L07 + LRD12
- 7 GV4L03 + LRD07
- 8 GV4L02 + LRD07



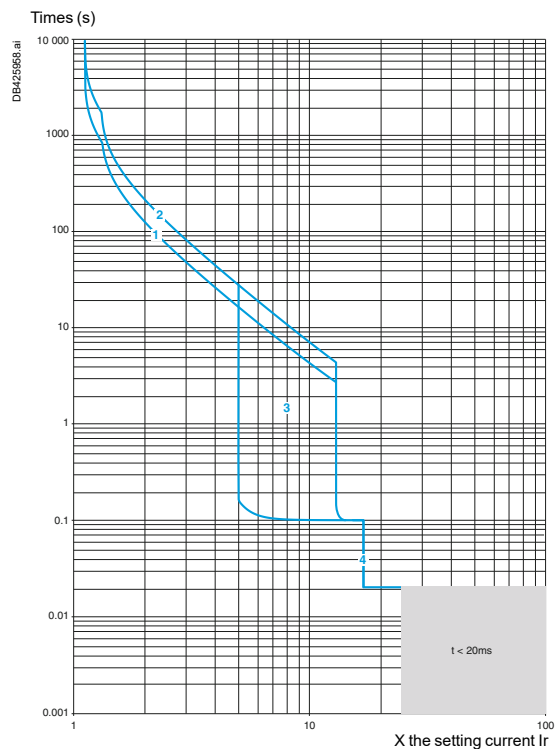
#### Thermal-magnetic tripping curves for GV4P, GV4PE, GV4PEM, GV4PB

Average operating times at 20 °C related to multiples of the setting current

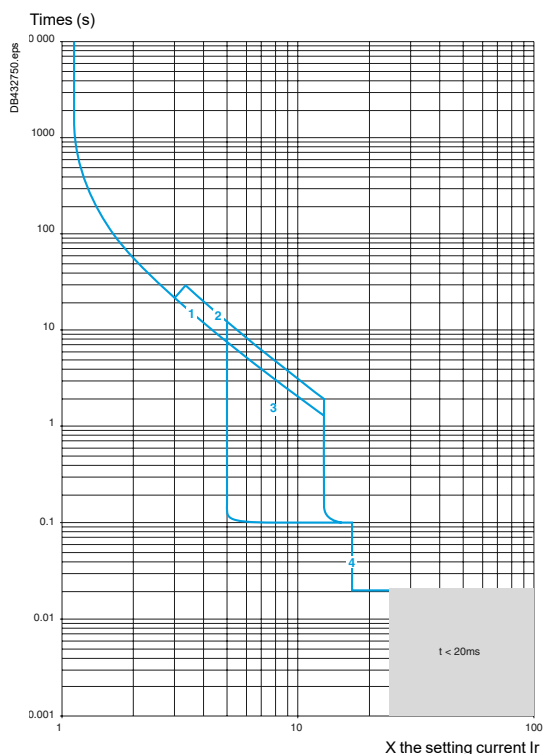
##### GV4P, GV4PE, GV4PEM



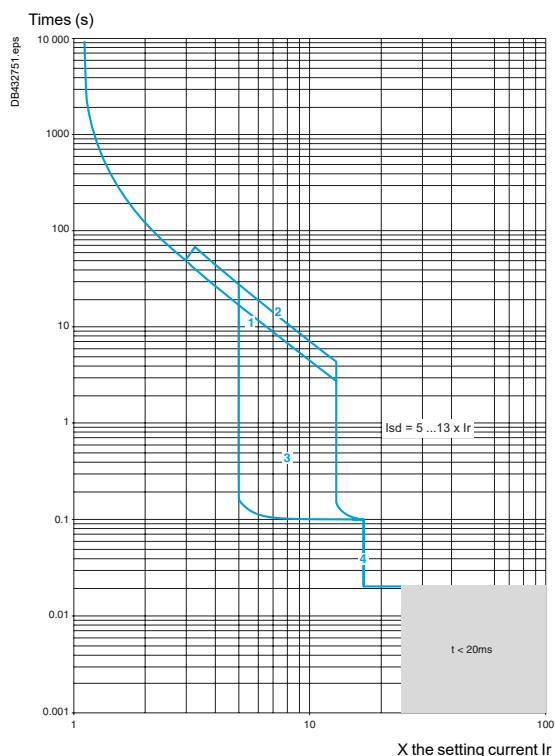
##### GV4P, GV4PE, GV4PEM



##### GV4PB



##### GV4PB



#### Hot state

- 1 Class 10
- 2 Class 20
- 3  $I_{sd} = 13 \times I_r$  (GV4P - GV4PE);  $I_{sd} = 5 \dots 13 \times I_r$  (GV4PEM - GV4PB)
- 4  $I_i = 17 I_r$

#### Cold state

- 1 Class 10
- 2 Class 20
- 3  $I_{sd} = 13 \times I_r$  (GV4P - GV4PE);  $I_{sd} = 5 \dots 13 \times I_r$  (GV4PEM - GV4PB)
- 4  $I_i = 17 I_r$

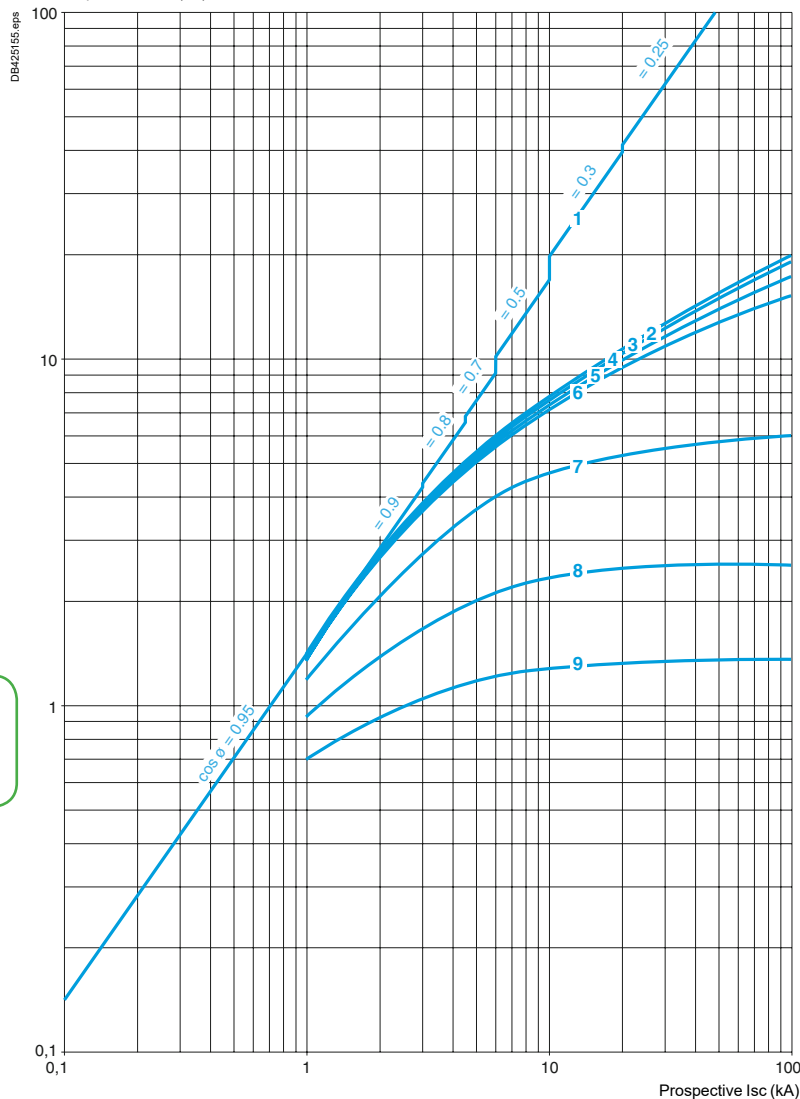


#### Current limitation on short-circuit for GV4P, GV4PE, GV4PEM, GV4PB (3-phase 400/415 V)

##### Dynamic stress

$I_{peak} = f(\text{prospective } I_{sc}) \text{ at } 1.05 U_e = 435 \text{ V}$

Limited peak current (kA)



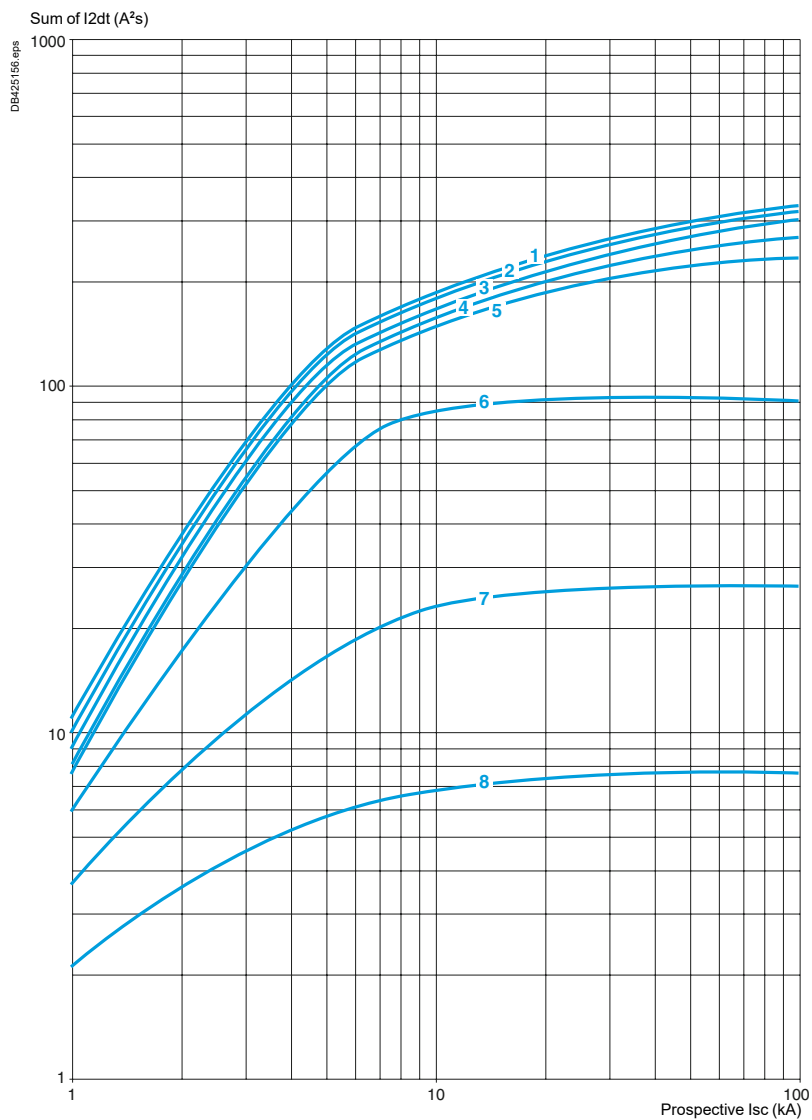
- 1 Maximum peak current
- 2 GV4P115
- 3 GV4P80
- 4 GV4P50
- 5 GV4P25
- 6 GV4P12
- 7 GV4P07
- 8 GV4P03
- 9 GV4P02



#### Thermal limit on short-circuit for GV4P, GV4PE, GV4PEM, GV4PB

#### Thermal limit in $kA^2s$ in the magnetic operating zone

Sum of  $I^2dt = f$  (prospective  $I_{sc}$ ) at  $1.05 U_e = 435 V$



- 1 GV4P115
- 2 GV4P80
- 3 GV4P50
- 4 GV4P25
- 5 GV4P12
- 6 GV4P07
- 7 GV4P03
- 8 GV4P02



# TeSys

## TeSys GV4 circuit breakers - Electric trips

### Characteristics

#### Characteristics of electric trips

Type of trip		GV4AU●●● MN (undervoltage release)							
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	= Ue						
Operational voltage (Ue)	Conforming to IEC 60947-1	V	24 V AC/DC	48 V AC/DC	110-130 V AC 125 V DC	208-240 V 60 Hz 220-240 V 50 Hz	277 V 60 Hz	380-415 V 60 Hz	440-480 V 60 Hz
Inrush consumption	~	VA	< 7 VA < 2 W	< 7 VA < 2 W	< 7 VA < 2 W	< 7 VA	< 7 VA	< 7 VA	< 7 VA
Sealed consumption	~	VA	< 7 VA < 2 W	< 7 VA < 2 W	< 7 VA < 2 W	< 7 VA	< 7 VA	< 7 VA	< 7 VA
Operating time	Conforming to IEC 60947-1	ms	< 50						
On-load factor			100 %						
Cabling (spring connection)	Number of conductors		1 per terminal						
	Solid cable	mm <sup>2</sup>	No solid cable allowed						
	Flexible cable without cable end	mm <sup>2</sup> AWG	Cu 0.5 mm <sup>2</sup> to 1.5 mm <sup>2</sup> Cu 20AWG to 16AWG						
	Flexible cable with cable end	mm <sup>2</sup>	No cable with cable end allowed						
Tightening torque		N.m	NA						
Mechanical durability (C.O.: Close - Open)		C.O.	20000						

Ref.

#### Characteristics of electric trips

Type of trip		GV4AS●●● MX (Shunt trip)					
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	= Ue				
Operational voltage (Ue)	Conforming to IEC 60947-1	V	24 V AC/DC	48 V AC/DC	110-130 V AC 125 V DC	208-240 V 60 Hz 220-240 V 50 Hz	380-415 V 50 Hz 440-480 V 60 Hz
Inrush consumption	~	VA	< 6 VA < 10 W	< 6 VA < 10 W	< 6 VA < 10 W	< 6 VA	< 6 VA
Sealed consumption	~	VA	< 4 VA < 1 W	< 4 VA < 1 W	< 4 VA < 1 W	< 4 VA	< 4 VA
Operating time	Conforming to IEC 60947-1	ms	< 50				
On-load factor			100 %				
Cabling (spring connection)	Number of conductors		1 per terminal				
	Solid cable	mm <sup>2</sup>	No solid cable allowed				
	Flexible cable without cable end	mm <sup>2</sup> AWG	Cu 0.5 mm <sup>2</sup> to 1.5 mm <sup>2</sup> Cu 20AWG to 16AWG				
	Flexible cable with cable end	mm <sup>2</sup>	No cable with cable end allowed				
Tightening torque		N.m	NA				
Mechanical durability (C.O.: Close - Open)		C.O.	20000				

Circuit breakers



# TeSys

## TeSys GV4 circuit breakers - Auxiliary contacts

### Characteristics

Auxiliary contact characteristics															
Type of contacts			Auxiliary contact block GV4AE11						SDx contact module for GV4PEM , GV4PB, GV4ADM1111						
Rated insulation voltage(Ui)	Conforming to IEC 60947-1	V	690						250						
	Conforming to CSA C22-2 n°14 UL 508	V	-						-						
Conventional thermal current (Ith)	Conforming to IEC 60947-5-1	A	5						5						
	Conforming to CSA C22-2 n°14 UL 508	A	5						5						
Mechanical durability (C.O.: Close - Open)		C.O.	40 000						100 000						
Operational power and current conforming to IEC 60947-5-1 a.c. operation	Rated operational voltage (Ue)	V	24	48	110/ 127	230/ 240	380/ 440	660/ 690	48	110	230/ 240	380/ 415	440	690	
	Operational power (AC12)	VA	120	240	635	1200	2200	3450			400				
	Occasional breaking and making capacities	kVA	1.2	2.4	6.35	12	22	34.5							
	Operational current (Ie)	AC-12	A	5	5	5	5	5	5						
		AC-15	A	5	5	4	3	2.5	0.1		3	1.5			
Operational power and current conforming to IEC 60947-5-1 d.c. operation	Rated operational voltage (Ue)	V	24	48	110	250			24	48	60	110	250		
	Operational power (DC12)	W	120	120	66	75			50						
	Occasional breaking and making capacities	W	1200	1200	660	750									
	Rated operational current (Ie)	DC-12	A	5	2.5	0.6	0.3								
		DC-13	A	2.5	1.2	0.35	0.05			2			0.22	0.11	
		DC-14	A	1	0.2	0.05	0.03								
Low power switching reliability of contact			10 <sup>-6</sup> at 17 V / 2 mA												
Minimum operational conditions d.c. operation		V	17												
		mA	2												
Short-circuit protection			5 A fuse gG conforming to IEC 60947-5-1												
Spring terminals cabling	Number of conductors		1 per hole												
	Solid cable	mm²	-						0.2 to 1.5						
	Flexible cable without cable end	mm²	0.5 to 1.5						0.2 to 2.5						
	Flexible cable with cable end	mm²	-						0.25 to 1.5						

Ref.

Circuit breakers



# TeSys

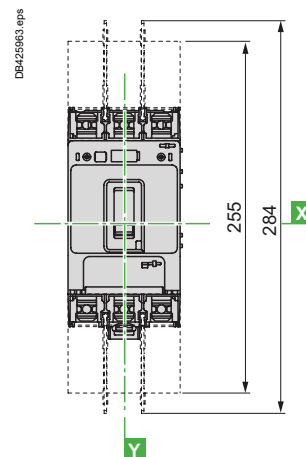
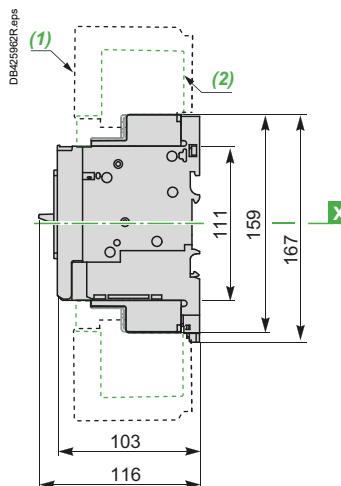
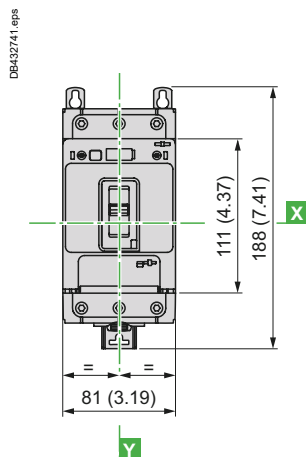
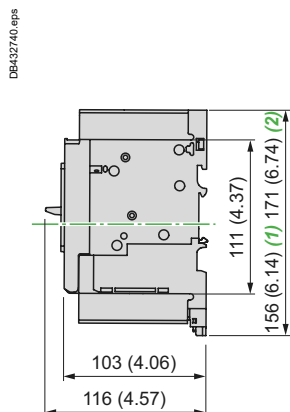
## TeSys GV4 Motor circuit breakers

### Dimensions and mounting

#### GV4 with toggle: GV4LE, GV4PE, GV4PEM, GV4PB

With EverLink® connector

With crimp lug connector



Ref.

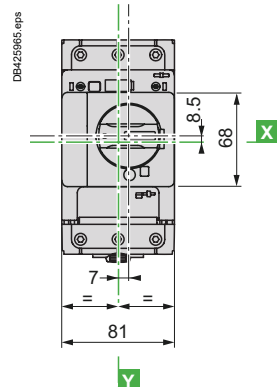
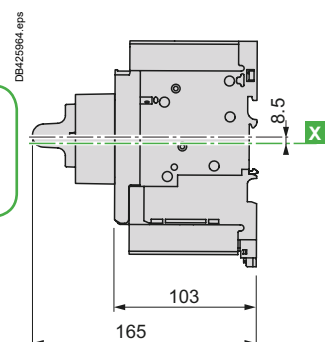
(1) GV4LE, GV4PE, GV4PEM.  
(2) GV4PB.

(1) Interphase barriers.  
(2) Long terminal shield.

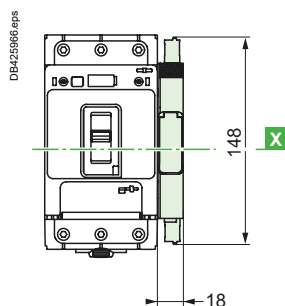
#### GV4 with rotary handle: GV4L, GV4P, or GV4LE, GV4PE, GV4PEM, GV4PB with GV4ADN01, GV4ADN02 direct mounting rotary handle

Dimensions

Circuit breakers



#### SDx module





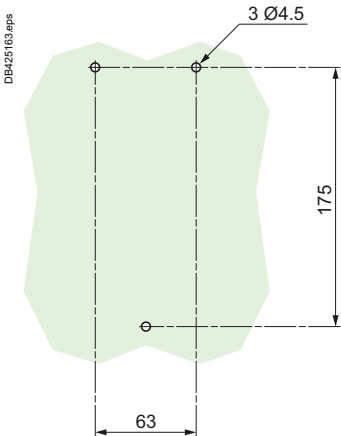
# TeSys

## TeSys GV4 Motor circuit breakers

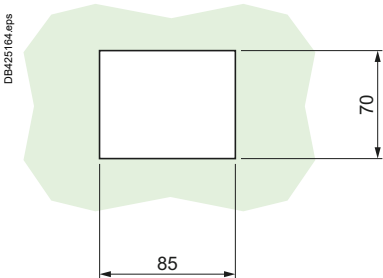
### Dimensions and mounting

#### GV4L, GV4P, GV4LE, GV4PE, GV4PEM, GV4PB

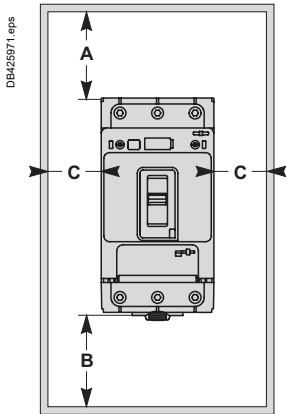
##### Panel mounting with M4 screws



##### Door cut-out for rotary handle



##### Minimum safety clearance



Toggle-type, rotary handle-type:  
identical clearance values.

##### Safety clearance (mm)

	Painted sheet metal			Bare sheet metal		
	A	B	C	A	B	C
No accessory	30	0	0	40	0	5
Interphase barriers	0	0	0	0	0	5
Long terminal shield	0	0	0	0	0	5

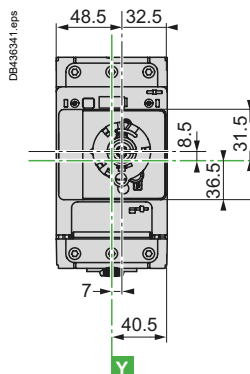
Ref.



Circuit  
breakers

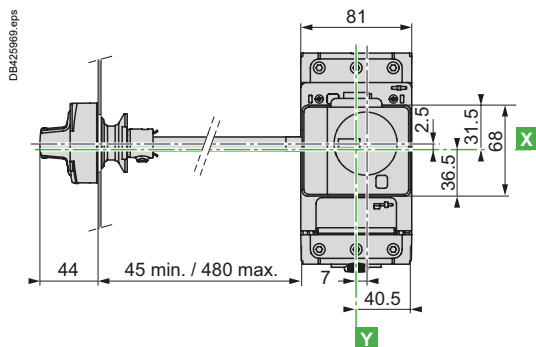


**Front extended rotary handle GV4APN01, GV4APN02, GV4APN04**



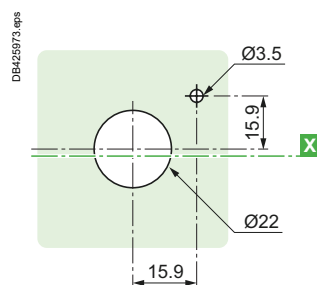
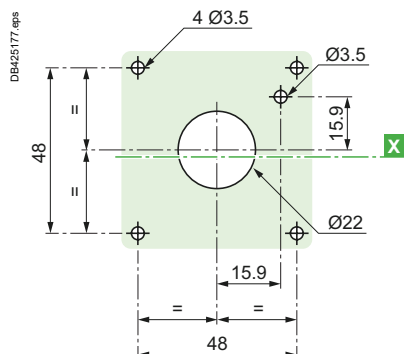
## Circuit breakers

## Circuit breakers



### Front and side extended rotary handle

**IP54, door/side panel cut-out**





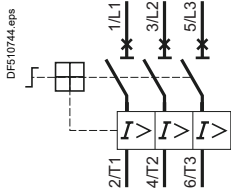
# TeSys

## TeSys GV4 Motor circuit breakers

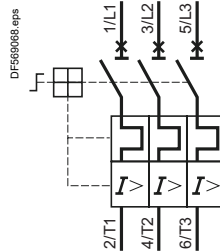
### Schemes

#### Magnetic motor circuit breakers

##### GV4L, GV4LE



##### GV4P, GV4PE, GV4PEM, GV4PB



#### Accessories

##### Electrical trips

###### MN GV4AU●●●



###### MX GV4AS●●●



##### GV4AE11 auxiliary contacts

###### Used as OF contact

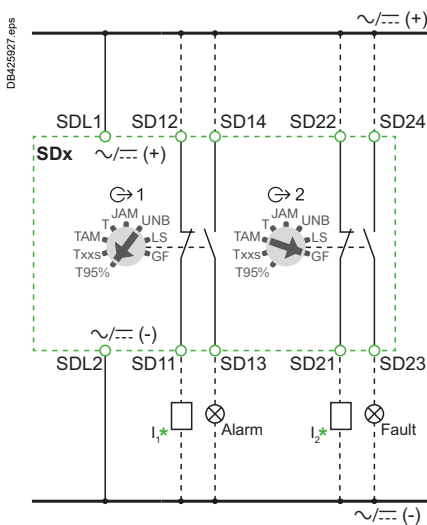


###### Used as SD contact



#### Side mounting add-on contact blocks

##### Instantaneous auxiliary contacts and fault signalling contacts



\* I1, I2: PLC digital inputs - used as alarm inputs, as an example.

Ref.



Circuit breakers



Circuit  
breakers

B6/130

Life | s On

**Schneider**  
Electric



# TeSys GV5/GV6

55 to 250 kW





## Environment

Circuit breaker type			GV5P/ GV6P
Conforming to standards			IEC/EN 60947-4-1 IEC/EN 60947-2 UL 60947-4-1 CSA C22.2 n° 60947-4-1
Product certifications			CB, UL, CSA, EAC, DNV-GL <sup>(1)</sup>
Climatic withstand			According to IACS E10
Degree of protection (front face)	Conforming to IEC 60529	Bare circuit breaker with terminal shields Installed in switchboard	IP40 with direct rotary handle IP40 with direct rotary handle / IP43 with MCC conversion accessory/ IP55 with extended rotary handle
Shock resistance	Conforming to IEC 60068-2-27		15 gn -11 ms
Vibration resistance	Conforming to IEC 60068-2-6		2.5 gn (25 Hz)
Ambient air temperature	Storage in packing		°C -50...+85
	Operation	Open mounted	°C -25... +70
		In enclosure	°C -25...+70
Flame resistance	Conforming to IEC 60695-2-11		°C 960
Maximum operating altitude			m 2000
Suitable for isolation	Conforming to IEC 60947-1 § 7-1-6		Yes
Resistance to mechanical impact			J 0.5
Sensitivity to phase failure			Yes

## Technical characteristics

Circuit breaker type			GV5P150	GV5P220	GV6P320	GV6P500
Utilisation category	Conforming to IEC 60947-2		A			
	Conforming to IEC 60947-4-1		AC-3			
Rated operational voltage (Ue)	Conforming to IEC 60947-2	V	690			
Rated insulation voltage (Ui)	Conforming to IEC 60947-2	V	800			
Rated voltage	Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1	V	600			
Rated operational frequency	Conforming to IEC 60947-4-1 UL, CSA	Hz	50/60			
Rated impulse withstand voltage (U imp)	Conforming to IEC 60947-2	kV	8			
Total power dissipated per pole		W	9.2	17.6	19.2	39.7
Mechanical durability (C.O.: Close, Open)		C.O.	40 000	20 000	15 000	15 000
Electrical durability for AC-3 duty	400/415 V (In)	C.O.	20 000	10 000	6 000	4 000
Duty class (maximum operating rate)		C.O./h	25			
Maximum conventional rated thermal current (Ith)	Conforming to IEC 60947-4-1	A	70...150	100...220	160...320	250...500
Rated duty	Conforming to IEC 60947-4-1		Continuous duty			

<sup>(1)</sup> EAC & DNV-GL certifications are in progress. Please check with your nearest sales office for more details.

Ref.

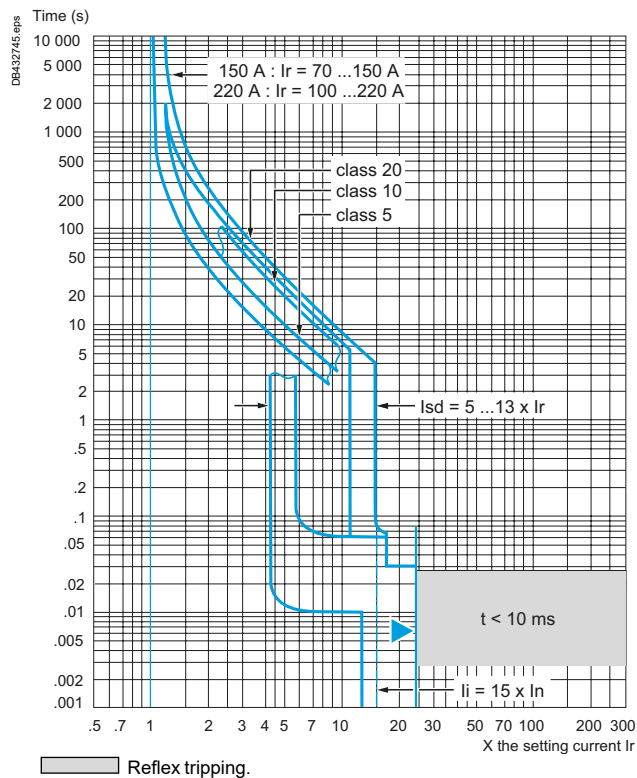


Circuit breakers



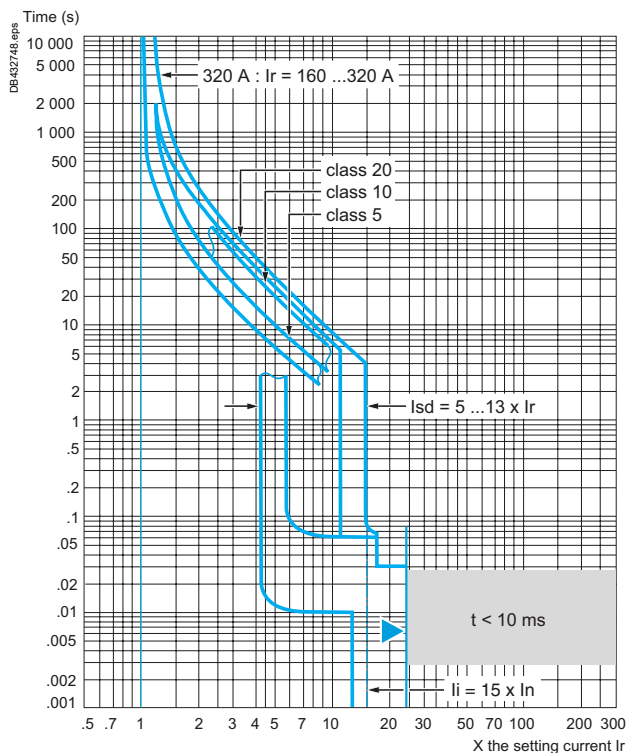
#### Thermal-magnetic tripping curves for GV5P

##### MicroLogic 2.2 M - 150/220 A

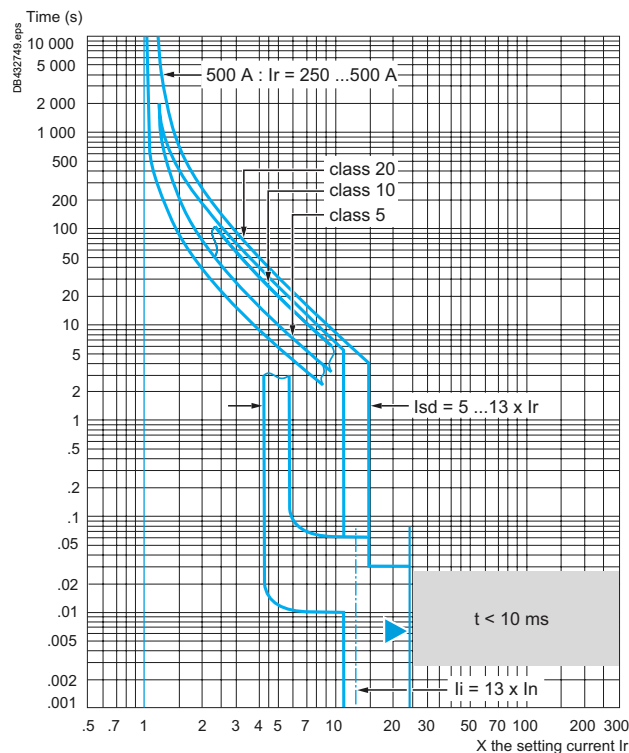


#### Thermal-magnetic tripping curves for GV6P

##### MicroLogic 2.3 M - 320 A



##### MicroLogic 2.3 M - 500 A





# TeSys

## TeSys GV5P and GV6P Thermal-magnetic circuit breakers

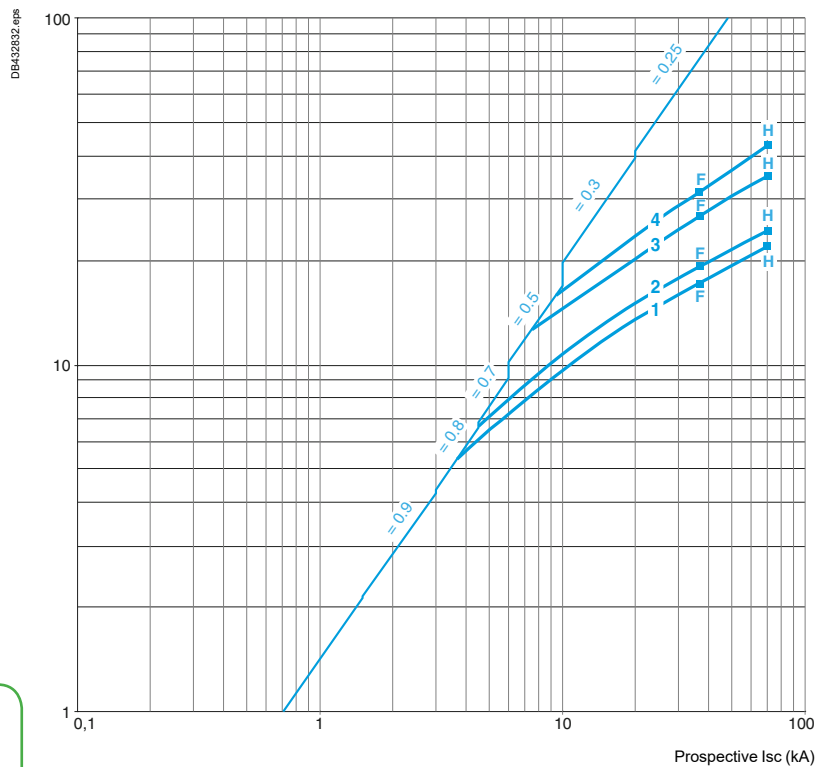
### Curves

#### Current limitation on short-circuit (3-phase 400 - 415 V)

#### Dynamic stress

For GV5P/6P...F/H type

Limited peak current (kA)



- 1 GV5P150F/H
- 2 GV5P220F/H
- 3 GV6P320F/H
- 4 GV6P500F/H

Ref.



Circuit breakers

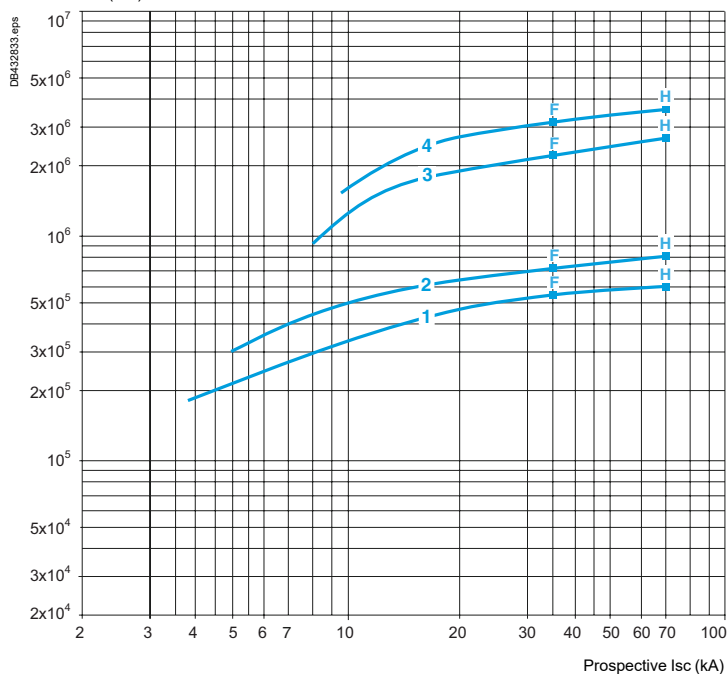


#### Maximum thermal limit on short-circuit

Thermal limit in  $\text{kA}^2\text{s}$  in the magnetic operating zone

Sum of  $I^2dt = f(\text{prospective } I_{sc})$  at  $1.05 U_e = 435 \text{ V}$

Sum of  $I^2dt$  ( $\text{A}^2\text{s}$ )



- 1 GV5P150F/H
- 2 GV5P220F/H
- 3 GV6P320F/H
- 4 GV6P500F/H

Ref.



Circuit  
breakers



### Characteristics of GV5P/GV6P electric trips

Type of trip			GV7AU●●● undervoltage trip	GV7AS●●● shunt trip
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690	690
	Conforming to CSA C22-2 n°14, UL 508	V	600	600
Operational voltage (Ue)	Conforming to IEC 60947-1	V	0.85...1.1 Uc	0.7...1.1 Uc
Drop-out voltage		V	0.7...0.35 Uc	0.7...0.35 Uc
Inrush consumption	~	VA	< 10	
Sealed consumption	~	VA	< 5	
Operating time	Conforming to IEC 60947-1	ms	From the moment the voltage reaches its operational value until opening of the circuit breaker. < 50	
On-load factor			100 %	
Cabling	Number of conductors		1	
	Solid cable	mm²	1.5	
	Flexible cable without cable end	mm²	1.5	
	Flexible cable with cable end	mm²	1	
Tightening torque		N.m	1.2	
Mechanical durability (C.O.: Close - Open)		C.O.	50 % of the mechanical durability of the circuit breaker.	

### Characteristics of GV5P/GV6P thermal fault module

Type of trip			LV429424 <sup>(1)</sup>
Operational voltage (Ue)	Conforming to IEC 60947-1	V	24 to 415 V AC/ DC
Conventional thermal current (Ith)	Conforming to IEC 60947-5-1	A	80 mA max.

(1) LV429424 takes the place of the AU/AS electric trip coil and an auxiliary contact.



Auxiliary contact characteristics															
Type of contacts			GV7AE11							GV7AB11					
Rated insulation voltage(Ui) (associated insulation coordination)	Conforming to IEC 60947-1	V	690							690					
Conventional thermal current (Ith)	Conforming to IEC 60947-5-1	A	6							5					
Mechanical durability (C.O.: Close - Open)		C.O.	50 000							50 000					
Operational current conforming to IEC 60947-5-1 a.c. operation	Rated operational voltage (Ue)		AC-12 or AC-15. 50 000 C.O.							AC-12 or AC-15. 50 000 C.O.					
			24	48	110	220/ 240	380/ 440	690	24	48	110	230/ 240	380/ 415		
		Rated operational current (Ie)	AC-12	A	6	6	6	6	6	6	5	5	5	5	5
			AC-15	A	6	6	5	4	2	0.1	3	3	2.5	2	1.5
Operational current conforming to IEC 60947-5-1 d.c. operation	Rated operational voltage (Ue)		DC-12 or DC-14. 50 000 C.O.							DC-12 or DC-14. 50 000 C.O.					
			24	48		110	250	24	48		110	250			
		Rated operational current (Ie)	DC-12	A	6	2.5		0.6	0.3	5	2.5		0.6	0.3	
			DC-14	A	1	0.2		0.05	0.03	1	0.2		0.05	0.03	
Minimum operational conditions d.c. operation		V	24							4					
		mA	100							1					
Short-circuit protection			By <b>GB2CB●●</b> circuit breaker (rating according to operational current for Ue ≤ 415 V) or gG fuse, 10 A max.												
Cabling	Solid cable	mm <sup>2</sup>	1 x 1.5 conductor							1 x 1.5 conductor					
	Flexible cable without cable end	mm <sup>2</sup>	1 x 1.5 conductor							1 x 1.5 conductor					
	Flexible cable with cable end	mm <sup>2</sup>	1 x 1.5 conductor							1 x 1.5 conductor					

Ref.

Circuit  
breakers



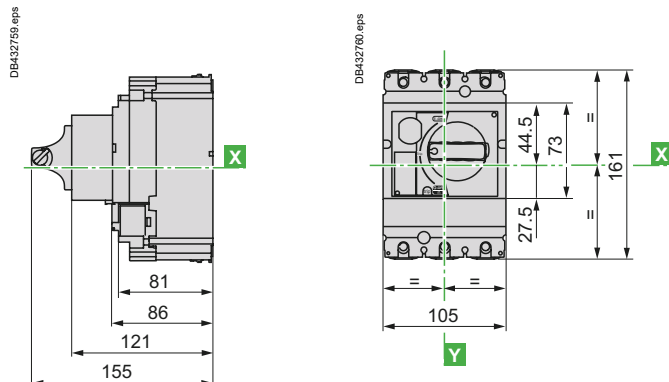
# TeSys

## TeSys GV5P, GV6P Motor circuit breakers

### Dimensions and mounting

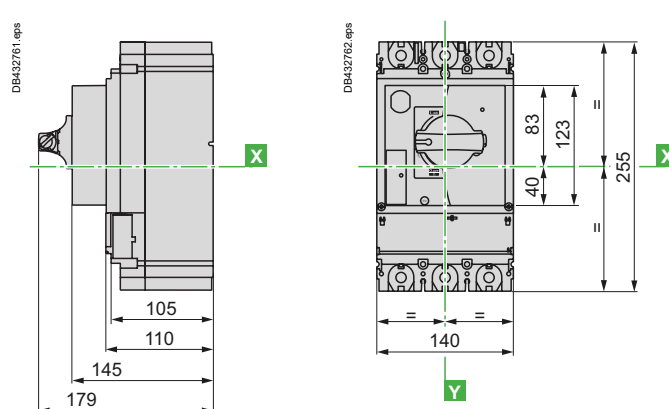
#### GV5P

##### Dimensions



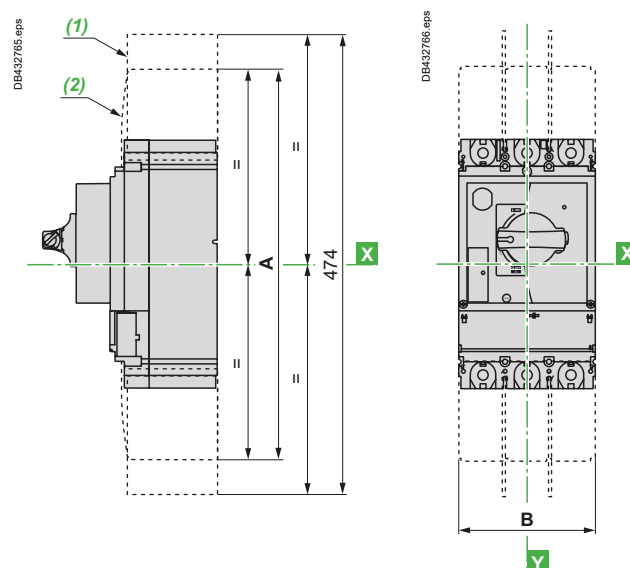
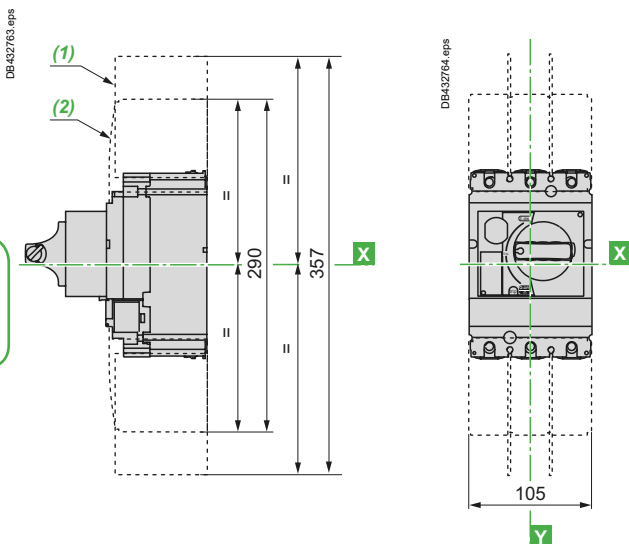
#### GV6P

##### Dimensions



#### With long terminal shields or interphases barriers GV5P + GV7AC04/GV7AC01

#### GV6P + LV432593 / LV432595 / LV432570

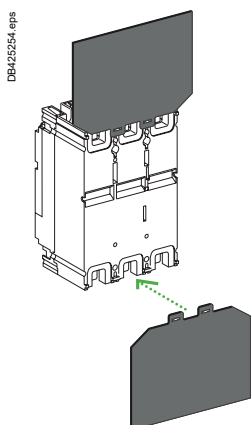


- (1) Interphases barriers: **GV7AC04**.  
(2) Terminal shield: **GV7AC01**.

- (1) Interphases barriers: **LV432570**.  
(2) Terminal shield: **LV432593 (45mm) / LV432595 (52.5mm)**.

	A	B
<b>LV432593</b>	400	140
<b>LV432595</b>	480	157.5

#### Insulating screen



Motor circuit breaker	GV5P + GV7AC05	GV6P + LV432578
3P W x H x thickness (mm)	140 x 105 x 1	203 x 175 x 1.5



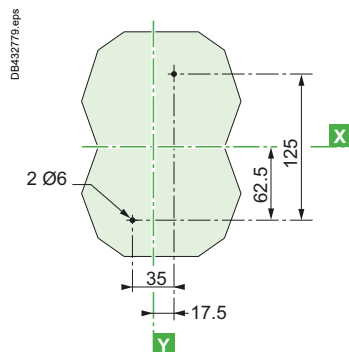
# TeSys

## TeSys GV5P, GV6P Motor circuit breakers

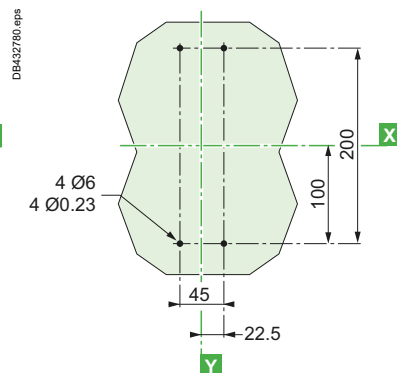
### Dimensions and mounting

#### GV5P/GV6P

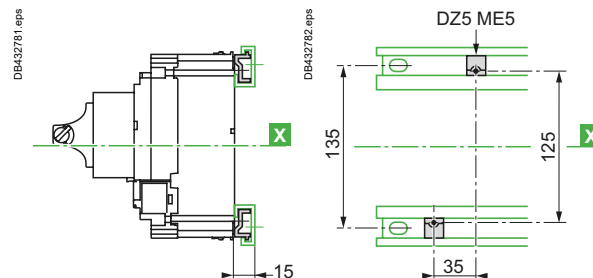
##### Panel mounting - GV5P



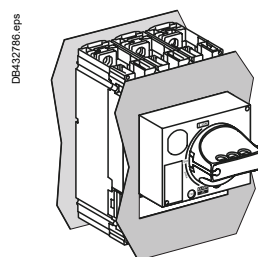
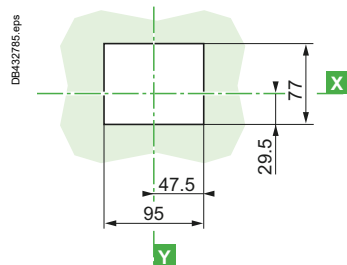
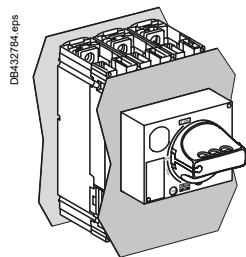
##### Panel mounting - GV6P



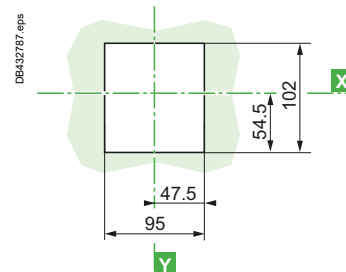
##### Mounting on 2 mounting rails for GV5P only



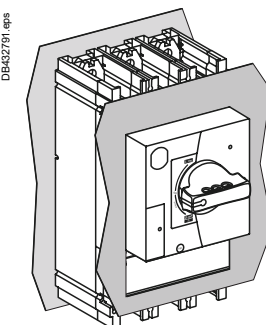
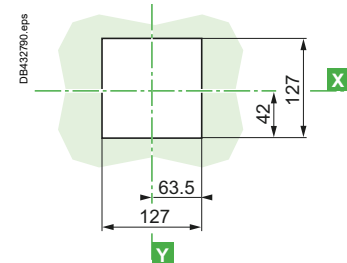
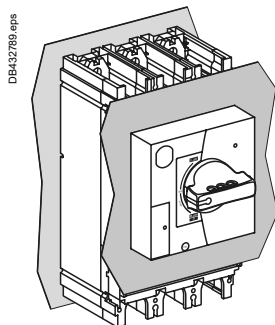
##### Door cut-out mounting GV5P



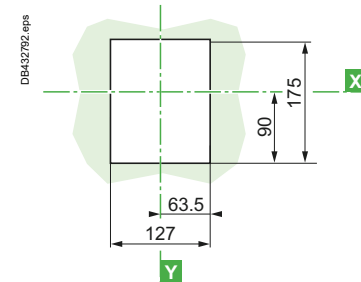
##### With access to trip unit



##### Door cut-out mounting GV6P



##### With access to trip unit





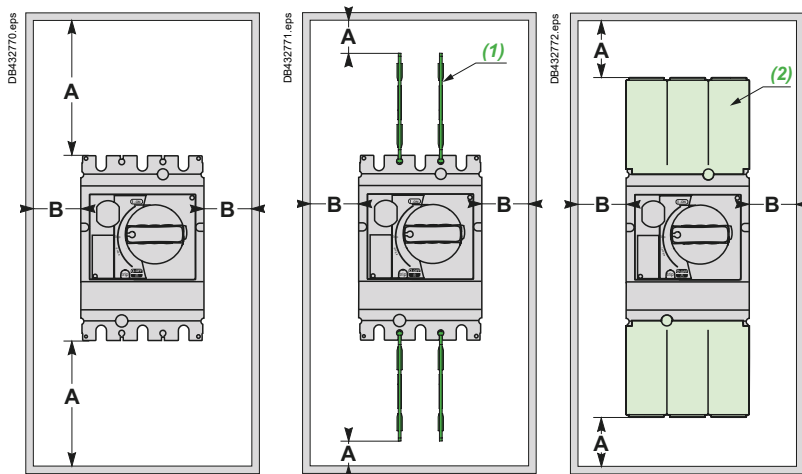
# TeSys

## TeSys GV5P, GV6P Motor circuit breakers

### Dimensions and mounting

#### GV5P

##### Minimum electrical clearance

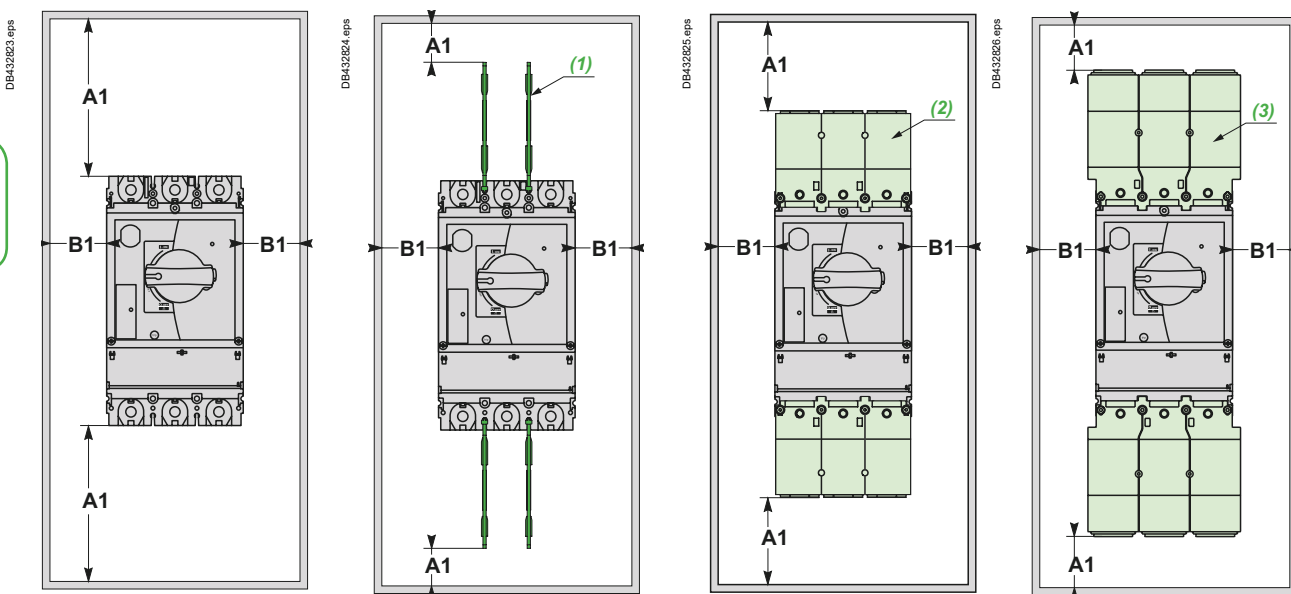


##### Clearance in mm

		Painted sheet metal		Bare metal plate	
		A	B	A	B
No accessories	$V \leq 500 V \sim$	30	0	40	20
	$V > 500 V \sim$	-	-	-	-
Interphases barriers <sup>(1)</sup>	$V \leq 500 V \sim$	0	0	10	20
	$V > 500 V \sim$	-	-	-	-
Terminal shield <sup>(2)</sup>	$V \leq 500 V \sim$	0	0	10	10
	$V > 500 V \sim$	30	10	40	20

#### GV6P

##### Minimum electrical clearance



##### Clearance in mm

		Painted sheet metal		Bare sheet metal	
		A1	B1	A1	B1
No accessories	$V \leq 500 V \sim$	30	0	40	20
	$V > 500 V \sim$	-	-	-	-
Interphase barriers <sup>(1)</sup>	$V \leq 500 V \sim$	0	0	10	20
	$V > 500 V \sim$	-	-	-	-
Long terminal shield (LV432593) <sup>(2)</sup>	$V \leq 500 V \sim$	30	0	40	10
	$V > 500 V \sim$	50	0	50	20
Long terminal shield (LV432595) <sup>(3)</sup>	$V \leq 500 V \sim$	0	0	10	10
	$V > 500 V \sim$	30	0	30	20



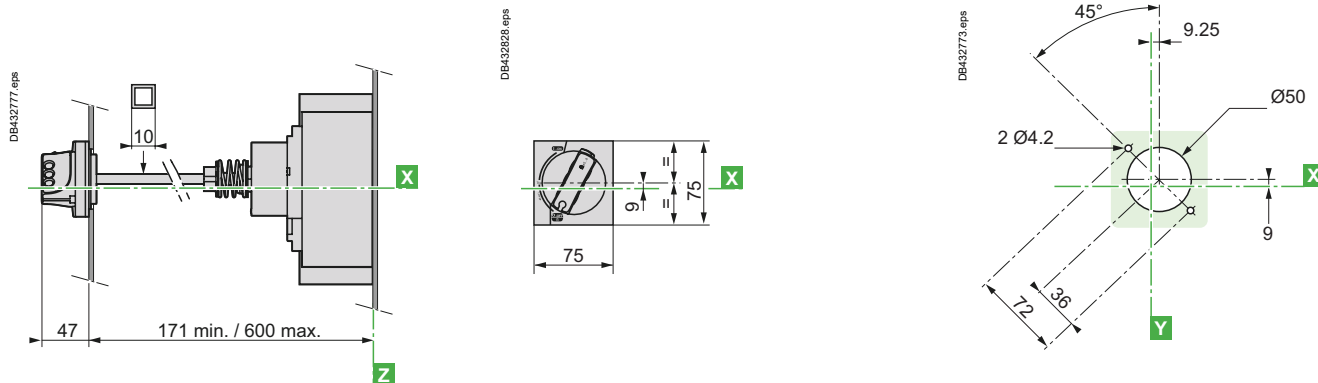
# TeSys

## TeSys GV5P, GV6P Motor circuit breakers

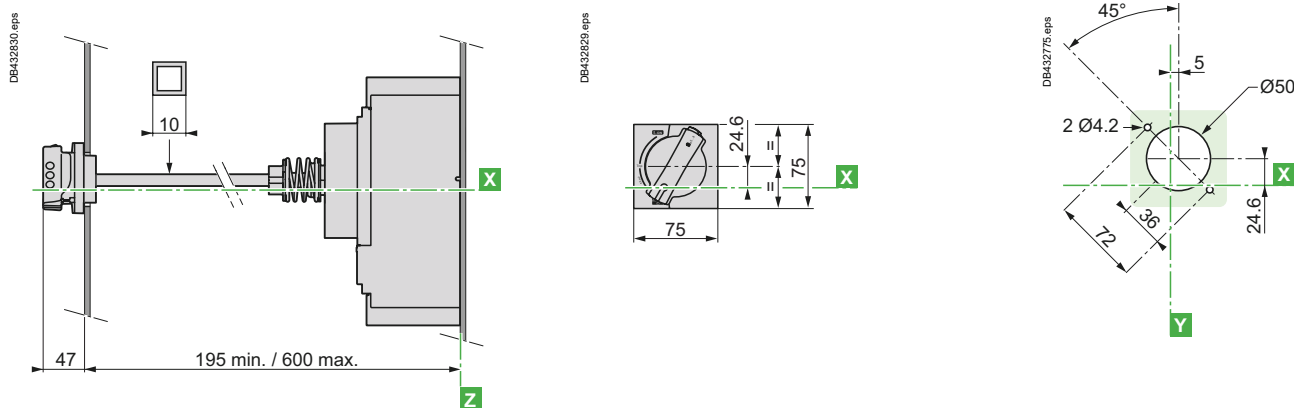
### Dimensions and mounting

#### GV5P/GV6P

##### GV5 with extended rotary handle GV7AP01/ GV7AP02

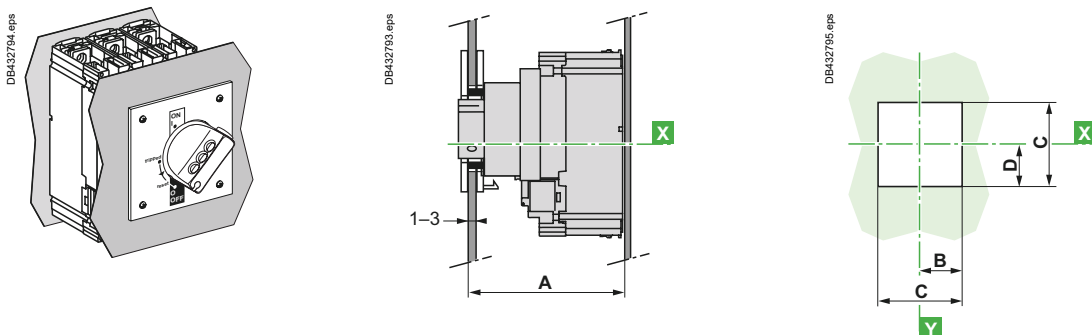


##### GV6 with extended rotary handle LV432598/ LV432600



#### GV5P/GV6P

##### MCC type direct rotary handle



	A	B	C	D
150/220 A	125 ±2	50	100	41
320/500 A	149 ±2	72.5	145	51



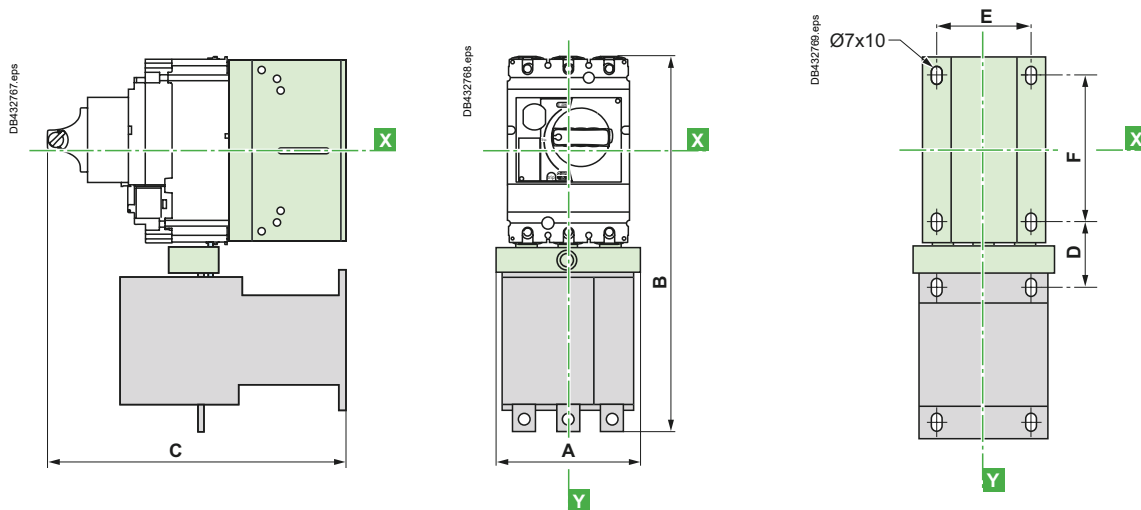
# TeSys

## TeSys GV5P, GV6P Motor circuit breakers

### Dimensions and mounting

#### GV5P

Combination of GV5P and TeSys contactor LC1F●●●/LC1D●●● with kit GV7AC0●



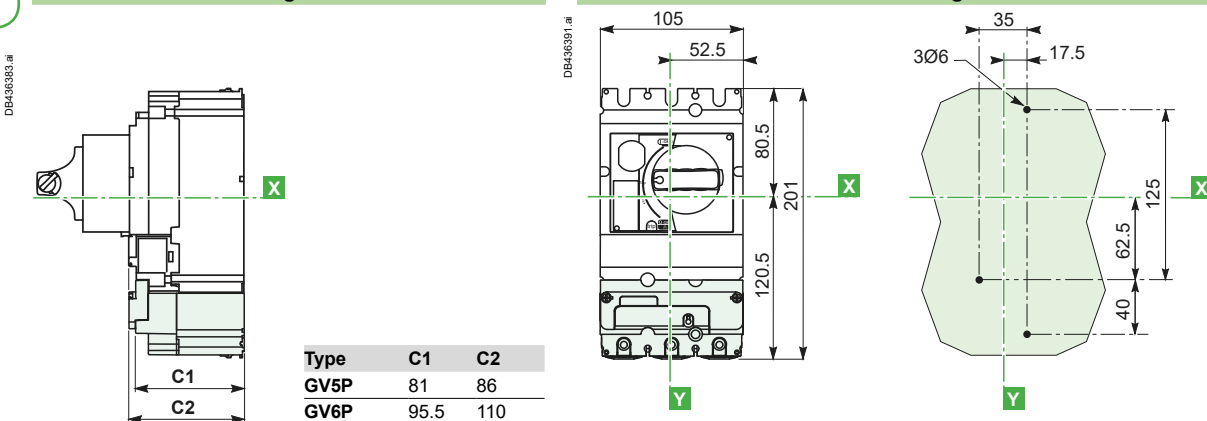
	A	B	C	D	E	F
GV5P + LC1F115 + GV7AC06	119	334	243	44	85	120
GV5P + LC1F150 + GV7AC06	119	334	243	46	85	120
GV5P + LC1F185 + GV7AC06	119	338	249	48	85	120
GV5P + LC1F225 + GV7AC07	131	358	249	57	85	120
GV5P + LC1F265 + GV7AC07	131	364	277	60	85	120
GV5P + LC1D115 + GV7AC08	120	332	205	48	85	120
GV5P + LC1D150 + GV7AC08	120	332	205	48	85	120

Minimum distance between 2 circuit breakers mounted side by side = 0

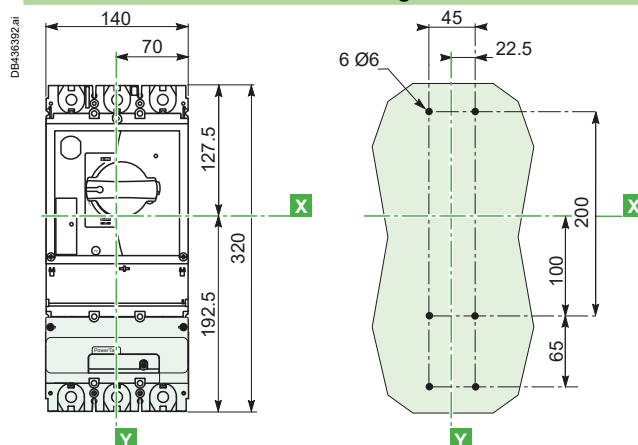
#### GV5P/GV6P

With additional PowerTag

GV5P with LV434020 / Panel mounting



GV6P with LV434022 / Panel mounting





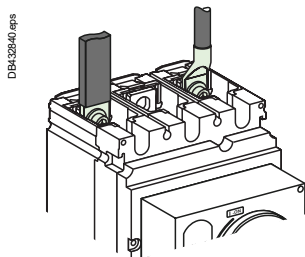
# TeSys

## TeSys GV5P, GV6P Motor circuit breakers

### Dimensions and mounting

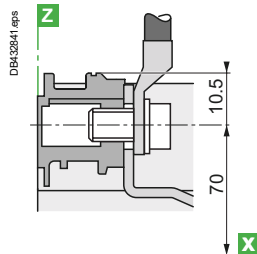
#### GV5P/GV6P

##### Front connection without accessories



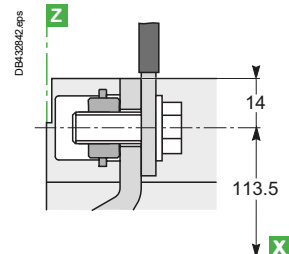
##### GV5P

##### Cables with lugs bars



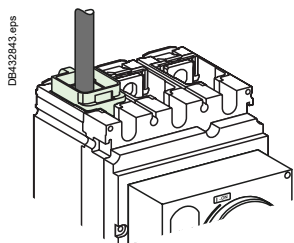
##### GV6P

##### Bars/cables with lugs

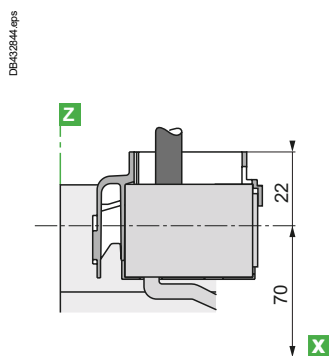


#### GV5P

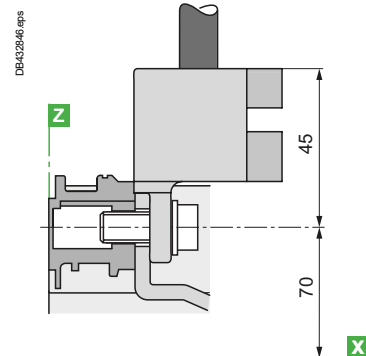
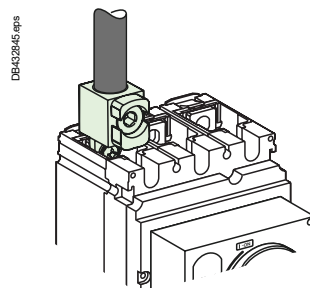
##### Bare-cables connectors



##### GV7AC021/LV429227/GV7AC022

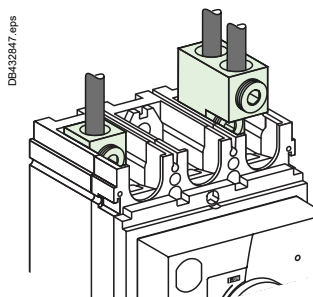


##### LV429244

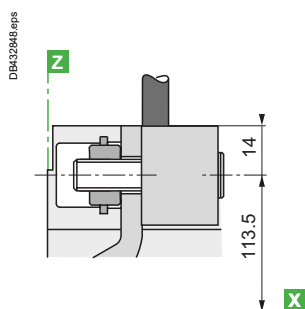


#### GV6P

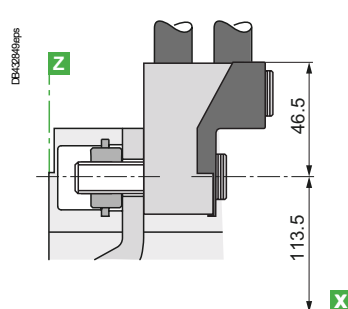
##### Bare-cables connectors



##### LV432479

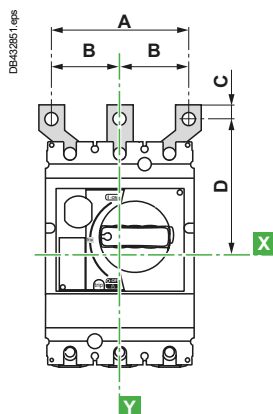
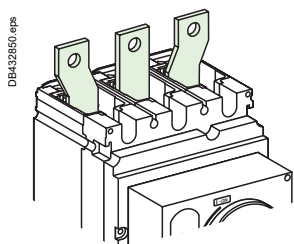


##### LV432481



#### GV5P/GV6P

##### Spreaders



Type	A	B	C	D
GV5P/ Spreaders GV7AC03	114	45	11	100
GV6P/ Spreaders LV432490	135	52.5	15	152.5
GV6P/ Spreaders LV432492	170	70	15	166



# TeSys

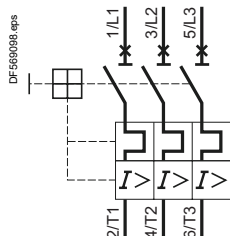
## TeSys GV5P, GV6P Motors circuit breakers

### Schemes

#### Schemes

##### Motor circuit breakers

###### GV5P/ 6P



##### Add-on auxiliary contacts according to their location <sup>(1)</sup>

###### GV7AE11, GV7AB11

###### Location 1 C/O contact



###### Location 2 Trip indication



###### Location 3 Electrical fault indication <sup>(2)</sup>



###### Location 4 C/O contact



A self-adhesive label, supplied with the contact, can be affixed to the front face of the circuit-breaker to allow personalised marking according to the function of the contact or contacts.

<sup>(1)</sup> See page B6/52 to B6/54.

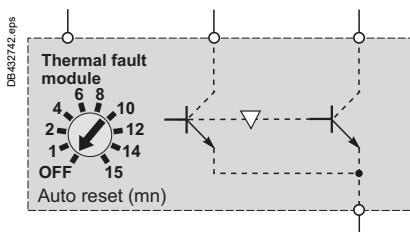
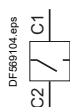
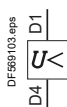
<sup>(2)</sup> Adapter **LV429451** is mandatory for electrical trip indication in GV5.

##### Electric trips

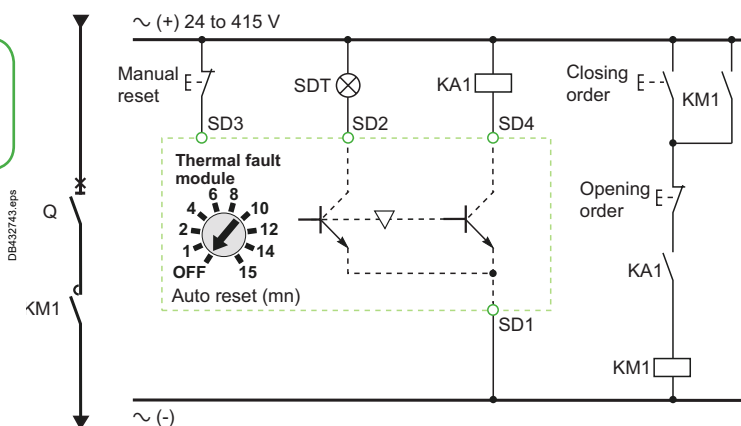
###### GV7AU●●●

###### GV7AS●●●

###### Thermal fault module LV429424



##### Recommended application schemes for LV429424



**SD1, SD3:** thermal fault module input power supply  
**SD2:** over-load fault signal output. This output will stay-put until reset  
**SD4:** contactor control output  
**SD2 and SD4:** Static outputs: 24 to 415 V AC / V DC; 80 mA max  
**KM1:** LC1D or LC1F contactor  
**KA1:** CA2 or CAD type control relays  
 Terminals shown in green ● must be connected by customer.



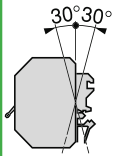
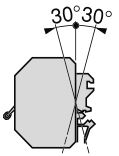
# TeSys GB2

0.5 to 20 A

(for equipment and control circuits)





Environment										
Circuit breaker type			GB2CB		GB2CD		GB2DB		GB2CS	
Conforming to standards			IEC 60947-1, 947-2, EN 60947-1, 60947-2							
Product certifications			cCSAus <sup>(1)</sup>		cCSAus <sup>(1)</sup>		—		—	
Degree of protection	Conforming to IEC 60529		IP 20							
Shock resistance	Conforming to IEC 60068-2-27		22 gn for 20 ms							
Vibration resistance	Conforming to IEC 60068-2-6		5 gn (5...110 Hz)							
Ambient air temperature around the device	Storage	°C	-40...+80							
	Operation	°C	-20...+60							
Flame resistance	Conforming to IEC 60695-2-11	°C	960							
Maximum operating altitude		m	3000							
Operating position		In relation to normal vertical mounting plane	<div><div><div><div></div><div><div>DF534265.eps</div></div></div><div><div>GB2CB,CD, CS</div></div></div><div><div><div><div></div><div><div>GB2DB</div></div></div></div></div></div>							
Cabling	Solid cable	mm <sup>2</sup>	Minimum c.s.a.				Maximum c.s.a.			
	Flexible cable with cable end	mm <sup>2</sup>	1 x 0.75				1 x 6 or 2 x 4			
Tightening torque		N.m	1.2				1 x 4 or 2 x 2.5			

Technical characteristics											
Utilisation category	Conforming to IEC 60947-2		A			A			A		
Rated operational voltage (U <sub>e</sub> )	Conforming to IEC 60947-2	V	250 <sup>(2)</sup>			250			415		
	Conforming to CSA C22-2 Nr 14 and UL 1077	V	277			277			—		
Rated operational frequency	Conforming to IEC 60947-2	Hz	50/60			50/60			50/60		
Rated impulse withstand voltage (U <sub>imp</sub> )	Conforming to IEC 60947-2	kV	4			4			4		
Total power dissipated per pole		W	2			2			2		
Mechanical and electrical durability	C.O.: Closing - Opening	C.O.	8000			8000			8000		
Operational current correction coefficient (a or ---)	According to the permissible ambient temperature	°C	-20	-10	0	+10	+20	+30	+40	+50	+60
	Correction coefficient		1.2	1.15	1.1	1.05	1	0.95	0.90	0.85	0.80
Tripping threshold	Of the magnetic trips		12...16 I <sub>n</sub>			12...16 I <sub>n</sub>			12...16 I <sub>n</sub>		

(1) Except for GB2CB16, GB2CB22, GB2CD16, GB2CD22.

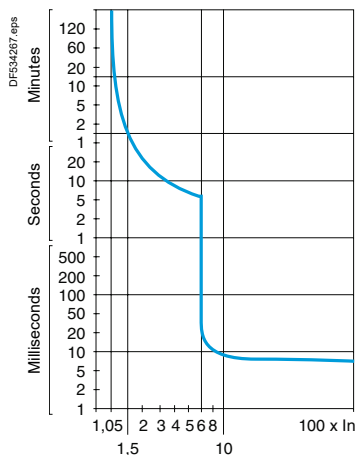
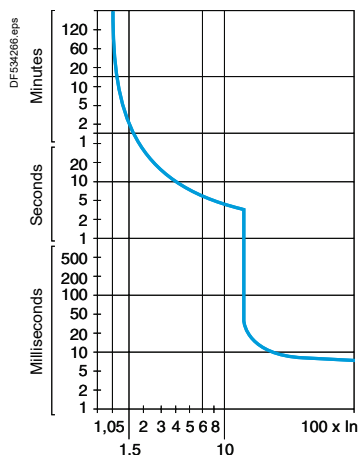
(2) U<sub>e</sub> = 415 V when a GB2 circuit breaker is fitted on every live conductor.

### Tripping curves

Average operating time at 20 °C without prior current flow (cold state)

GB2CB, GB2CD, GB2 DB

GB2CS





## Characteristics

Circuit breaker type				GB2											
				CB05	CB06	CB07	CB08	CB09	CB10	CB12	CB14	CB16	CB20	CB21	CB22
Rating			A	0.5	1	2	3	4	5	6	8	10	12	16	20
Breaking capacity conforming to IEC 60947-2 ~ 50/60 Hz	110 V	Icu	kA	50	50	15	10	6	3	3	3	2	2	2	2
		Ics % <sup>(1)</sup>		100	50	50	50	50	75	75	75	75	75	75	75
	230/240 V	Icu	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5
		Ics % <sup>(1)</sup>		25	25	25	50	50	75	75	75	75	75	75	75
Associated fuses, if required if Isc > breaking capacity Icu conforming to IEC 60947-2	110 V	aM	A	★	★	20	25	25	40	40	50	50	63	63	63
		gG	A	★	★	25	32	32	50	50	63	63	80	80	80
	230/240 V	aM	A	★	★	16	20	20	32	32	40	40	50	50	50
		gG	A	★	★	25	32	32	40	40	50	50	63	63	63
Circuit breaker type				GB2											
				CD05	CD06	CD07	CD08	CD09	CD10	CD12	CD14	CD16	CD20	CD21	CD22
Rating			A	0.5	1	2	3	4	5	6	8	10	12	16	20
Breaking capacity conforming to IEC 60947-2 ~ 50/60 Hz	110 V	Icu	kA	50	50	15	10	6	3	3	3	2	2	2	2
		Ics % <sup>(1)</sup>		100	50	50	50	50	75	75	75	75	75	75	75
	230/240 V	Icu	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5
		Ics % <sup>(1)</sup>		25	25	25	50	50	75	75	75	75	75	75	75
Associated fuses, if required if Isc > breaking capacity Icu conforming to IEC 60947-2	110 V	aM	A	★	★	20	25	25	40	40	50	50	63	63	63
		gG	A	★	★	25	32	32	50	50	63	63	80	80	80
	230/240 V	aM	A	★	★	16	20	20	32	32	40	40	50	50	50
		gG	A	★	★	25	32	32	40	40	50	50	63	63	63
Circuit breaker type				GB2											
				DB05	DB06	DB07	DB08	DB09	DB10	DB12	DB14	DB16	DB20	DB21	DB22
Rating			A	0.5	1	2	3	4	5	6	8	10	12	16	20
Breaking capacity conforming to IEC 60947-2 ~ 50/60 Hz	110 V	Icu	kA	50	50	15	10	6	3	3	3	2	2	2	2
		Ics % <sup>(1)</sup>		100	50	50	50	50	75	75	75	75	75	75	75
	230/240 V	Icu	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5
		Ics % <sup>(1)</sup>		25	25	25	50	50	75	75	75	75	75	75	75
	400/415 V	Icu	kA	50	50	15	3	3	2	1.5	1.5	1.5	1.5	1.5	1.5
		Ics % <sup>(1)</sup>		25	25	25	50	50	75	75	75	75	75	75	75
Associated fuses, if required if Isc > breaking capacity Icu conforming to IEC 60947-2	110 V	aM	A	★	★	20	25	25	40	40	50	50	63	63	63
		gG	A	★	★	25	32	32	50	50	63	63	80	80	80
	230/240 V	aM	A	★	★	16	20	20	32	32	40	40	50	50	50
		gG	A	★	★	25	32	32	40	40	50	50	63	63	63
	400/415 V	aM	A	★	★	16	20	20	32	32	40	40	50	50	50
		gG	A	★	★	25	32	32	40	40	50	50	63	63	63

(1) As % of Icu.

\* Fuse not required. Breaking capacity Icu &gt; Isc.

Ref.

Circuit  
breakers



## Characteristics

Circuit breaker type					GB2											
					●●05	●●06	●●07	●●08	●●09	●●10	●●12	●●14	●●16	●●20	●●21	●●22
Breaking capacity (Icu) conforming to IEC 60947-2 ---	24 V		kA	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	48 V		kA	1	1	1	1	1	1	1	1	1	—	—	—	—
Operational current conforming to IEC 60947-5-1 ---	DC-12	24 V	A	0.5	1	2	3	4	5	6	8	10	12	16	20	
		48 V	A	0.5	1	2	3	4	5	6	8	10	12	16	20	
	DC-13	24 V	A	0.5	1	2	3	4	5	6	8	10	12	16	20	
		48 V	A	0.5	1	2	3	4	5	6	8	—	—	—	—	
Circuit breaker type					GB2											
				A	CS05						CS06					
Rating				A	0.5						1					
Breaking capacity conforming to IEC 60947-2 ~ 50/60 Hz	110 V	Icu	kA	50						50						
		Ics % <sup>(1)</sup>		100						100						
	230/240 V	Icu	kA	50						50						
		Ics % <sup>(1)</sup>		25						25						
	400/415 V <sup>(2)</sup>	Icu	kA	50						50						
		Ics % <sup>(1)</sup>		25						25						
Breaking capacity (Icu) conforming to IEC 60947-2 ---	24 V		kA	1.5						1.5						
	48 V		kA	1						1						
Operational current conforming to IEC 60947-5-1 ---	DC-12	24 V	A	0.5						1						
		48 V	A	0.5						1						
	DC-13	24 V	A	0.5						1						
		48 V	A	0.5						1						
Maximum permissible line length for star-delta starting (length of cable containing 2 or more conductors)	With contactors LC●D09 ...D18	Operational voltage	V	48		110		230		48		110		230		
		C.s.a.	0.60 mm <sup>2</sup>	m	<sup>(3)</sup>		31		365		6		85		230	
			0.75 mm <sup>2</sup>	m	<sup>(3)</sup>		39		460		8		110		290	
			1 mm <sup>2</sup>	m	<sup>(3)</sup>		52		610		10		145		380	
			1.5 mm <sup>2</sup>	m	<sup>(3)</sup>		78		910		15		220		570	
			2.5 mm <sup>2</sup>	m	<sup>(3)</sup>		130		1520		26		360		950	
			4 mm <sup>2</sup>	m	<sup>(3)</sup>		200		2400		41		580		1500	
		With contactors LC●D25 ...D32	Operational voltage	V	48		110		230		48		110		230	
	C.s.a.		0.60 mm <sup>2</sup>	m	<sup>(3)</sup>		<sup>(3)</sup>		230		<sup>(3)</sup>		56		230	
			0.75 mm <sup>2</sup>	m	<sup>(3)</sup>		<sup>(3)</sup>		290		<sup>(3)</sup>		70		290	
			1 mm <sup>2</sup>	m	<sup>(3)</sup>		<sup>(3)</sup>		390		<sup>(3)</sup>		95		380	
			1.5 mm <sup>2</sup>	m	<sup>(3)</sup>		<sup>(3)</sup>		580		<sup>(3)</sup>		140		570	
			2.5 mm <sup>2</sup>	m	<sup>(3)</sup>		<sup>(3)</sup>		970		<sup>(3)</sup>		230		950	
			4 mm <sup>2</sup>	m	<sup>(3)</sup>		<sup>(3)</sup>		1500		<sup>(3)</sup>		375		1500	
	With contactors LC●D40 ...D80		Operational voltage	V	48		110		230		48		110		230	
		C.s.a.	0.60 mm <sup>2</sup>	m	<sup>(3)</sup>		<sup>(3)</sup>		46		<sup>(3)</sup>		13		100	
			0.75 mm <sup>2</sup>	m	<sup>(3)</sup>		<sup>(3)</sup>		60		<sup>(3)</sup>		17		130	
			1 mm <sup>2</sup>	m	<sup>(3)</sup>		<sup>(3)</sup>		80		<sup>(3)</sup>		22		170	
			1.5 mm <sup>2</sup>	m	<sup>(3)</sup>		<sup>(3)</sup>		120		<sup>(3)</sup>		34		250	
			2.5 mm <sup>2</sup>	m	<sup>(3)</sup>		<sup>(3)</sup>		190		<sup>(3)</sup>		56		420	
			4 mm <sup>2</sup>	m	<sup>(3)</sup>		<sup>(3)</sup>		310		<sup>(3)</sup>		90		680	

(1) As % of Icu.

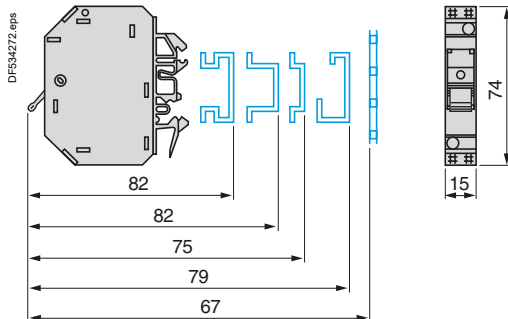
(2) One GB2CS circuit breaker on each live conductor.

(3) Use relays.

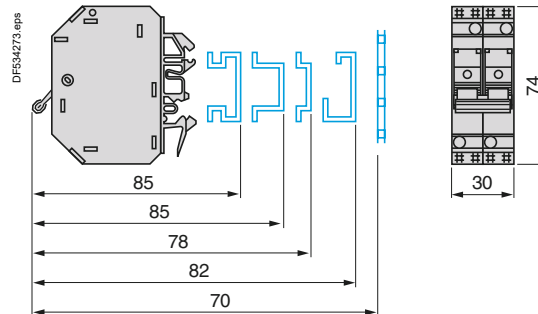


#### Dimensions

##### GB2CB●●, GB2CD●●, GB2CS●●



##### GB2DB●●



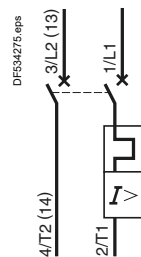
Marking: up to twelve AB1 R clip-in markers.

#### Schemes

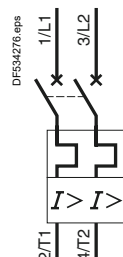
##### GB2CB●●



##### GB2CD●●



##### GB2DB●●



##### GB2CS●●



Ref.



Circuit breakers



Circuit  
breakers

B6/150

Life | s On



**Schneider**  
Electric



### TeSys SK, K Relays - For control of TeSys K contactor coils and other devices

Type of product		Pages
Mini relay - 2 contacts, simultaneous action TeSys SK, SKE		B7/2
Relays - 4 contacts, simultaneous action TeSys K		B7/4
Auxiliary contact blocks, accessories		B7/6

### TeSys D Relays - For control of TeSys D contactor coils and other devices

Relays and auxiliary contact blocks 5 contacts, simultaneous action TeSys D		B7/8
Accessories		B7/10



# TeSys

## TeSys SK, SKE Mini-control relays

### Product references



CA2SK11●●

#### Mini-control relays

- Width of mini-control relays 27 mm.
- Mounting on 35 mm rail.
- Connection by connectors.

Control circuit supply	Auxiliary contacts		Basic reference, to be completed by adding the voltage code <sup>(1)</sup>
a.c. supply			CA2SK20●●
	1	1	CA2SK11●●
d.c. supply			CA3SK20●●
	1	1	CA3SK11●●



CA2SKE20●●

#### Mini-control relay with alternating contacts

This mini-control relay with alternating contacts (see function diagram page B7/17) makes it possible to automatically split the operating time between 2 circuits of a redundant system. By regularly energising the “safety circuits”, this device makes it possible to ensure that they are operating correctly.

- Width of mini-control relay 45 mm.
- Fixing by Ø4 screws.
- Connection by connectors.
- Cannot be fitted with front-mounted auxiliary contact block.
- Cannot be fitted with coil suppressor module.

Control circuit supply	Auxiliary contacts		Basic reference, to be completed by adding the voltage code <sup>(1)</sup>
a.c. supply			CA2SKE20●●

<sup>(1)</sup> Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

#### Mini-control relays CA2SK and CA2SKE

Volts ~ 50/60 Hz	24	48	110	120	220	230	240	380	400
Code	B7	E7	F7	G7	M7	P7	U7	Q7	V7

#### Mini-control relays CA3SK

Volts ---	12	24	36	48	72
Code	JD	BD	CD	ED	SD



Control  
relays



# TeSys

## TeSys SK, SKE Mini-control relays - Contact block - Suppressor

### Product references



LA1SK●●

#### Instantaneous auxiliary contact blocks

##### Clip-on front mounting

For use on control relays	Maximum number of blocks per contactor	Composition		Reference
CA2SK20	1			
		2	–	LA1SK20
		–	2	LA1SK02
		1	1	LA1SK11



LA4SK●1●

#### Suppressor modules

##### Connection without need for tools by clipping onto right-hand side of contactor

For use on control relays	Type	For voltages	Sold in lots of	Unit reference
CA2SK and CA3SK	Varistor (1)	~ and --- 24 V...48 V	10	LA4SKE1E
		~ and --- 110 V...250 V	10	LA4SKE1U
	Diode (2)	--- 24 V...250 V	10	LA4SKC1U

- (1) Protection provided by limiting the transient voltage to 2 Uc max.  
Maximum reduction of transient voltage peaks.  
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
- (2) No overvoltage or oscillating frequency.  
Slight increase in drop-out time (1.1 to 1.5 times the normal time).



Control  
relays





CA2KN22●●



CA2KN●●5●●



CA3KN●●3●●



CA3KN●●7●●



Control  
relays

## Control relays for a.c. control circuit

- Mounting on 35 mm rail or Ø4 screw fixing.
- Screws in the open "ready-to-tighten" position.

Control circuit  
Consumption

Auxiliary  
contacts

Basic reference,  
to be completed by adding  
the voltage code <sup>(1)</sup>

### Screw clamp connections

4.5 VA

4	—	CA2KN40●●
3	1	CA2KN31●●
2	2	CA2KN22●●

### Spring terminal connections

4.5 VA

4	—	CA2KN403●●
3	1	CA2KN313●●
2	2	CA2KN223●●

### Faston connectors, 1 x 6.35 or 2 x 2.8

4.5 VA

4	—	CA2KN407●●
3	1	CA2KN317●●
2	2	CA2KN227●●

### Solder pins for printed circuit boards

4.5 VA

4	—	CA2KN405●●
3	1	CA2KN315●●
2	2	CA2KN225●●

## Control relays for d.c. control circuit

- Mounting on 35 mm rail or Ø4 screw fixing.
- Screws in the open "ready-to-tighten" position.

### Screw clamp connections

3 W

4	—	CA3KN40●●
3	1	CA3KN31●●
2	2	CA3KN22●●

### Spring terminal connections

3 W

4	—	CA3KN403●●
3	1	CA3KN313●●
2	2	CA3KN223●●

### Faston connectors, 1 x 6.35 or 2 x 2.8

3 W

4	—	CA3KN407●●
3	1	CA3KN317●●
2	2	CA3KN227●●

### Solder pins for printed circuit boards

3 W

4	—	CA3KN405●●
3	1	CA3KN315●●
2	2	CA3KN225●●

<sup>(1)</sup> Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Control relays CA2K (0.8...1.15 Uc) (0.85...1.1 Uc)

Volts ~	12	20	24 <sup>(2)</sup>	36	42	48	110	115	127	220/	230	230/	380/	400	400/	440	500	660/
50/60 Hz										230		240	400		415			690
Code	J7	Z7	B7	C7	D7	E7	F7	FE7	FC7	M7	P7	U7	Q7	V7	N7	R7	S7	Y7

Up to and including 240 V, coil with integral suppression device available: add 2 to the code required. Example: J72

Control relays CA3K (0.8...1.15 Uc)

Volts —	12	20	24 <sup>(2)</sup>	36	48	60	72	100	110	125	200	220	230	240	250
Code	JD	ZD	BD	CD	ED	ND	SD	KD	FD	GD	LD	MD	MPD	MUD	UD

Coil with integral suppression device available: add 3 to the code required. Example: JD3.

<sup>(2)</sup> When connecting an electronic sensor or timer in series with the coil of the control relay, select a 20 V coil (~ code Z7, — code ZD) so as to compensate for the incurred voltage drop.





CA4KN40●●●

### Low consumption control relays d.c. control circuit

- Mounting on 35 mm rail or Ø4 screw fixing.
- Screws in the open "ready-to-tighten" position.

Control circuit Consumption	Auxiliary contacts	Basic reference, to be completed by adding the voltage code <sup>(1)</sup>
<b>Screw clamp connections</b>		
1.8 W	4 —	CA4KN40●●
	3 1	CA4KN31●●
	2 2	CA4KN22●●
<b>Spring terminal connections</b>		
1.8 W	4 —	CA4KN403●●
	3 1	CA4KN313●●
	2 2	CA4KN223●●
<b>Faston connectors, 1 x 6.35 or 2 x 2.8</b>		
1.8 W	4 —	CA4KN407●●
	3 1	CA4KN317●●
	2 2	CA4KN227●●
<b>Solder pins for printed circuit boards</b>		
1.8 W	4 —	CA4KN405●●
	3 1	CA4KN315●●
	2 2	CA4KN225●●

<sup>(1)</sup> Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Control relays CA4K (Wide range coil: 0.7...1.3 Uc)

Volts ~	12	20	24	48	72	110	120
Code	JW3	ZW3	BW3	EW3	SW3	FW3	GW3

Coil with integral suppression device fitted as standard, by bi-directional peak limiting diode.



Control  
relays





LA1KN22



LA1KN003



LA1KN007



LA2KT2E

### Instantaneous auxiliary contact blocks

#### Clip-on front mounting, 1 per control relay

Connection	Composition		Reference
Screw clamp terminals		2	LA1KN20
		—	LA1KN02
		1	LA1KN11
		4	LA1KN40 <sup>(1)</sup>
		3	LA1KN31 <sup>(1)</sup>
		2	LA1KN22 <sup>(1)</sup>
		1	LA1KN13 <sup>(1)</sup>
		—	LA1KN04 <sup>(1)</sup>
Spring terminals		2	LA1KN203
		—	LA1KN023
		1	LA1KN113
		4	LA1KN403 <sup>(1)</sup>
		3	LA1KN313 <sup>(1)</sup>
		2	LA1KN223 <sup>(1)</sup>
		1	LA1KN133 <sup>(1)</sup>
		—	LA1KN043 <sup>(1)</sup>
Faston connectors 1 x 6.35 or 2 x 2.8		2	LA1KN207
		—	LA1KN027
		1	LA1KN117
		4	LA1KN407 <sup>(1)</sup>
		3	LA1KN317 <sup>(1)</sup>
		2	LA1KN227 <sup>(1)</sup>
		1	LA1KN137 <sup>(1)</sup>
		—	LA1KN047 <sup>(1)</sup>

### Electronic time delay contact blocks

- Relay output with common point changeover contact, ~ or — 240 V, 2 A maximum
- Control voltage 0.85...1.1 Uc
- Maximum switching capacity 250 VA or 150 W
- Operating temperature -10...+60 °C
- Reset time: 1.5 s during the time delay period 0.5 s after the time delay period

#### Clip-on front mounting, 1 per control relay

Voltage	Type	Timing range	Composition	Reference
<b>V</b>		<b>s</b>		
~ or — 24...48	On-delay	1...30	1	LA2KT2E
~ 110...240	On-delay	1...30	1	LA2KT2U

#### Other versions

Electronic timers type RE4.  
Please consult your Regional Sales Office.

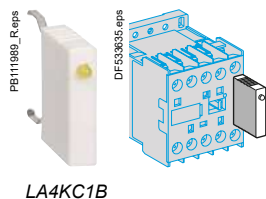
<sup>(1)</sup> Block of 4 contacts for use on CA2K and CA3K.



# TeSys

## TeSys K Control relays - Accessories

### Product references

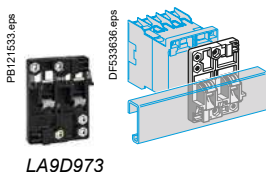


#### Suppressor modules incorporating LED indicator

Mounting and connection	Type	For voltages	Sold in lots of	Unit reference
Clips onto front of relay with locating device. No tools required.	Varistor <sup>(1)</sup>	~ and --- 12...24 V	5	LA4KE1B
		~ and --- 32...48 V	5	LA4KE1E
		~ and --- 50...129 V	5	LA4KE1FC
		~ and --- 130...250 V	5	LA4KE1UG
	Diode + Zener diode <sup>(2)</sup>	--- 12...24 V	5	LA4KC1B
		--- 32...48 V	5	LA4KC1E
	RC <sup>(3)</sup>	~ 220...250 V	5	LA4KA1U

#### Mounting accessories

Description	Application		Sold in lots of	Unit reference
Mounting plates	On 1 □ rail	Clip-on	1	LA9D973
	On 2 □ rails	110/120 mm fixing centres	10	DX1AP25



#### Marking accessories

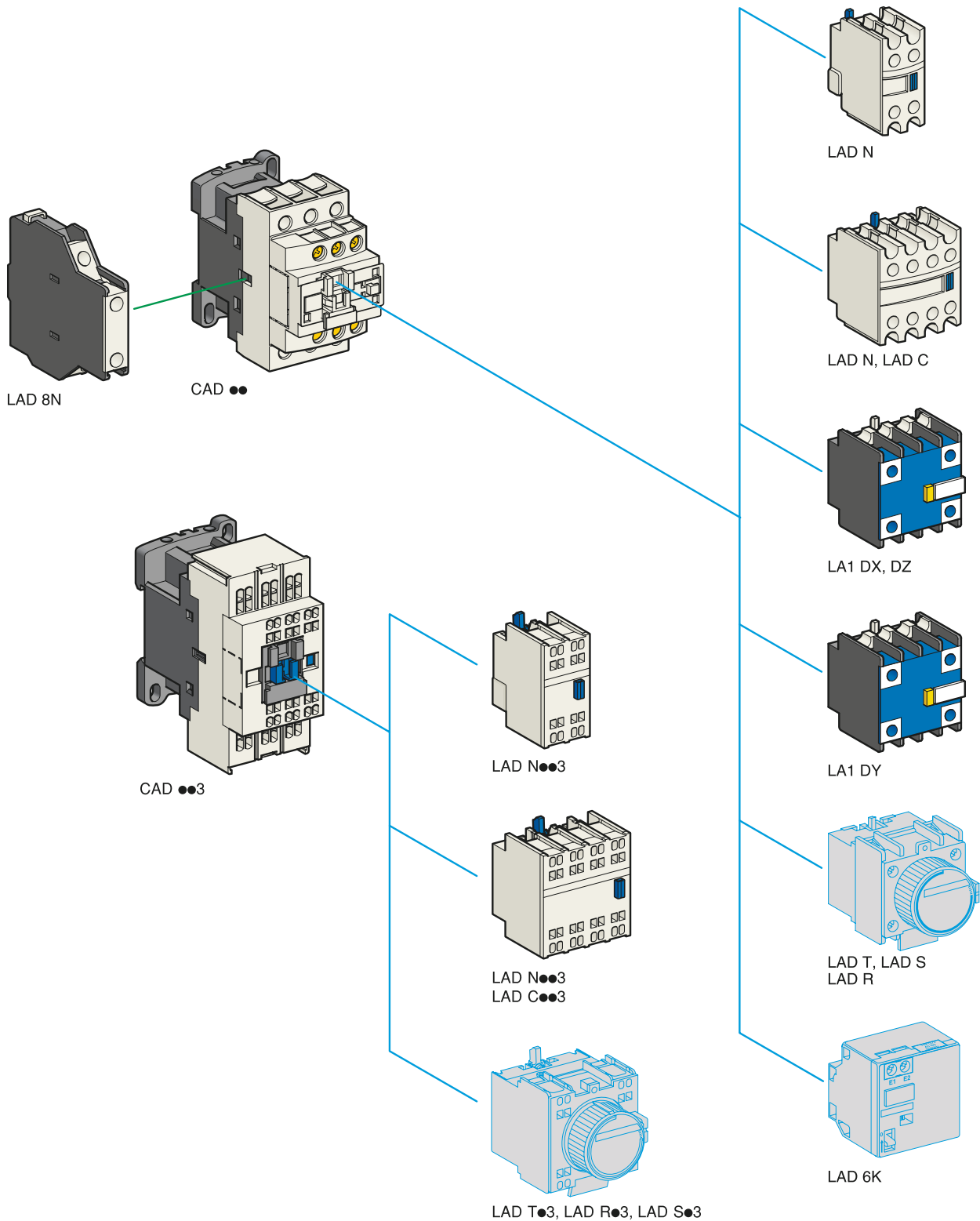
Description	Application		Sold in lots of	Unit reference
Marker holder	Clip-on fixing on front face	—	100	LA9D90
Clip-in markers	4 maximum per relay	Strips of 10 identical numbers 0 to 9	25	AB1R● <sup>(4)</sup>
		Strips of 10 identical capital letters A to Z	25	AB1G● <sup>(4)</sup>



- <sup>(1)</sup> Protection provided by limiting the transient voltage to 2 Uc max.  
Maximum reduction of transient voltage peaks.  
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
- <sup>(2)</sup> No overvoltage or oscillating frequency.  
Polarised component.  
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
- <sup>(3)</sup> Protection by limiting the transient voltage to 3 Uc max. and limitation of the oscillating frequency.  
Slight increase in drop-out time (1.2 to 2 times the normal time).
- <sup>(4)</sup> Complete the reference by replacing the dot with the required character.







Control  
relays

See page opposite for mounting possibilities  
according to control relay type and rating





CAD50●●



CAD503●●



LADN22



LA1DY20

### Control relays for connection by screw clamp terminals

Type	Number of contacts	Composition	Basic reference, to be completed by adding the control voltage code <sup>(1)</sup>
Instantaneous	5	5 —	CAD50●● <sup>(3)</sup>
		3 2	CAD32●● <sup>(3)</sup>

### Control relays for connection by spring terminals

Instantaneous	5	5 —	CAD503●●
		3 2	CAD323●●

### Instantaneous auxiliary contact blocks for connection by screw clamp terminals

For use in normal operating environments

Number of contacts	Maximum number per relay	Composition	Reference
	Clip-on mounting		
	front	side	
2	1	—	LADN11
	—	1 on LH side	LAD8N11 <sup>(6)</sup>
	1	—	LADN20
	—	1 on LH side	LAD8N20 <sup>(6)</sup>
	1	—	LADN02
4 <sup>(4)</sup>	—	1 on LH side	LAD8N02 <sup>(6)</sup>
	1	—	LADN22 LADN22S <sup>(7)</sup>
	—	—	LADN13
	—	—	LADN40
	—	—	LADN04
4 <sup>(4)</sup>	1	—	LADN31
	—	—	LADN31
	—	—	LADC22

Including 1 N/O and 1 N/C make before break.

### With dust and damp protected contacts, for use in particularly harsh industrial environments

Number of contacts	Maximum number per relay	Composition	Reference
	Front mounting		
		protected <sup>(5)</sup>	not protected
2	1	2 — —	— —
		— 2 —	— —
		2 — 2	— —
4 <sup>(4)</sup>	1	2 — —	2 —
		2 — —	1 1

### Instantaneous auxiliary contact blocks for connection by spring terminals

This type of connection is not possible for contact blocks LAD 8 and blocks with dust and damp protected contacts.

For all other instantaneous auxiliary contact blocks, add the digit 3 to the end of the references selected above.

Example: LADN11 becomes LADN113.

<sup>(1)</sup> Standard control circuit voltages (for other voltages, please consult your Regional Sales Office).

#### a.c. supply

Volts ~	24	42	48	110	115	220	230	240	380	400	415	440
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7

#### d.c. supply (coils with integral suppression device fitted as standard)

Volts —	12	24	36	48	60	72	110	125	220	250	440
U from 0.7 to 1.25 U <sub>c</sub> JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD	

#### Low consumption (coils with integral suppression device fitted as standard)

Volts —	5	12	20	24	48	110	220	250
Code	AL	JL	ZL	BL	EL	FL	ML	UL

<sup>(2)</sup> LC: low consumption.

<sup>(3)</sup> To order control relays with connection by lugs, add the digit 6 to the end of the selected reference.

Example: CAD50●● becomes CAD506●●.

<sup>(4)</sup> Blocks with 4 auxiliary contacts cannot be used on low consumption control relays.

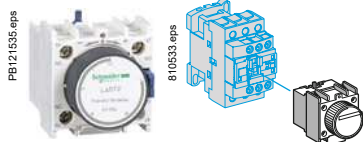
<sup>(5)</sup> Product fitted with 4 earth screen continuity terminals.

<sup>(6)</sup> These contact blocks are allowed with AC coil control relay only.

<sup>(7)</sup> With red front face - for safety chain indication.

<sup>(8)</sup> With 2 earth screen continuity poles.





LADT2

### Time delay auxiliary contact blocks for connection by screw clamp terminals <sup>(1)</sup>

Number and type of contacts	Maximum number per relay Front mounting	Time delay		Reference
		Type	Range	
1 N/C and 1 N/O	1	On-delay	0.1...3 s <sup>(2)</sup>	LADT0
			0.1...30 s	LADT2
			10...180 s	LADT4
			1...30 s <sup>(3)</sup>	LADS2
		Off-delay	0.1...3 s <sup>(2)</sup>	LADR0
			0.1...30 s	LADR2
			10...180 s	LADR4

(Sealing cover: see page B8/28)

### Time delay auxiliary contact blocks for connection by spring terminals

Add the digit **3** to the references selected above. Example: LADT0 becomes LADT03.

### Mechanical latch blocks <sup>(4)</sup>

Unlatching control	Maximum number per relay Front mounting	Basic reference to be completed <sup>(5)</sup>
Manual or electric	1	LAD6K10●

### Suppressor modules

These modules clip onto the top of the control relay and the electrical connection is instantly made. Fitting of an input module is still possible.

#### RC circuits (Resistor-Capacitor)

- Effective protection for circuits highly sensitive to "high frequency" interference.
- Voltage limited to 3 Uc maximum and oscillating frequency limited to 400 Hz maximum.
- Slight time delay on drop-out (1.2 to 2 times the normal time).

For mounting on	Operational voltage	Reference
CAD ~	~ 24...48 V	LAD4RCE
	~ 50...127 V	LAD4RCG
	~ 110...250 V	LAD4RCU

#### Varistors (peak limiting)

- Protection provided by limiting the transient voltage value to 2Uc maximum.
- Maximum reduction of transient voltage peaks.
- Slight time delay on drop-out (1.1 to 1.5 times the normal time).

CAD ~	~ 24...48 V	LAD4VE
	~ 50...127 V	LAD4VG
	~ 110...250 V	LAD4VU

#### Freewheel diode

- No overvoltage or oscillating frequency.
- Increase in drop-out time (6 to 10 times the normal time).
- Polarised component.

CAD ---	--- 5...600 V	LAD4DDL
---------	---------------	---------

#### Bidirectional peak limiting diode <sup>(6)</sup>

- Protection provided by limiting the transient overvoltage value to 2Uc maximum.
- Maximum reduction of transient voltage peaks.

CAD ~	~ 24 V	LAD4TB
	~ 72 V	LAD4TS
CAD ---	--- 24 V	LAD4TBDL
	--- 72 V	LAD4TSDL
	--- 125 V	LAD4TGD
	--- 250 V	LAD4TUDL
	--- 600 V	LAD4TXDL

<sup>(1)</sup> These contact blocks cannot be used on low consumption control relays.

<sup>(2)</sup> With extended scale from 0.1 to 0.6 s.

<sup>(3)</sup> With switching time of 40 ms ±15 ms between opening of the N/C contact and closing of the N/O contact.

<sup>(4)</sup> Power should not be simultaneously applied or maintained to the mechanical latching block of the CAD N. The duration of the control signal to the mechanical latching block and the CAD N should be ≥ 100 ms.

<sup>(5)</sup> Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts ~ and ---	24	32/36	42/48	60/72	100	110/127	220/240	256/277	380/415
Code	B	C	E	EN	K	F	M	U	Q

<sup>(6)</sup> CAD●●--- and low consumption control relays are fitted with a built-in bi-directional peak limiting diode suppressor as standard. On control relays produced after 15th July 2004, this diode is removable. It can therefore be replaced by the user (see references LAD4T●●● above). It can also be replaced by a freewheel diode LAD4DDL. If a d.c. or low consumption control relay is used without suppression, the standard suppressor should be replaced with a blanking plug LAD9DL.



### Accessories (to be ordered separately)

Description	For mounting on	Sold in lots of	Unit reference
<b>For marking</b>			
Sheet of 64 blank legends, self-adhesive, 8 x 33 mm	CAD, LAD (4 contacts)	10	LAD21
Sheet of 112 blank legends, self-adhesive, 8 x 12 mm	LAD (2 contacts), LADT		LAD22
Strips of blank, self-adhesive legends for printing by plotter (4 sets of 5 strips)	All products	35	LAD24
"SIS Label" labelling software for legends LAD 21 and LAD 22, supplied on CD-Rom	Multi-language version: English, French, German, Italian, Spanish	1	XBY2U
Legend holder, snap-in, 8 x 18 mm	LC1D09...38 LC1DT20...40 LADN (4 contacts) LADT, LAD R	100	LAD90

### For protection

Sealing cover	LADT, LAD R	1	LA9D901
Safety cover preventing access to the moving contact carrier	CAD	1	LAD9ET1
Red cover (for safety chain indication)	CAD	1	LAD9ET1S

### Spare parts: coils

#### Specifications

- Average consumption at 20 °C:
  - inrush ( $\cos \phi = 0.75$ ) 50/60 Hz: 70 VA at 50 Hz,
  - sealed ( $\cos \phi = 0.3$ ) 50/60 Hz: 8 VA at 60 Hz,
- Operating range ( $\theta < 60$  °C): 0.85 to 1.1  $U_c$

Control circuit voltage $U_c$	Average resistance at 20 °C $\pm 10$ %	Inductance of closed circuit	Reference <sup>(1)</sup> 50/60 Hz
V	V	H	
12	6.3	0.26	LXD1J7
21 <sup>(2)</sup>	5.6	0.24	LXD1Z7
24	6.19	0.26	LXD1B7
32	12.3	0.48	LXD1C7
36	—	—	LXD1CC7
42	19.15	0.77	LXD1D7
48	25	1	LXD1E7
60	—	—	LXD1EE7
100	—	—	LXD1K7
110	130	5.5	LXD1F7
115	—	—	LXD1FE7
120	159	6.7	LXD1G7
127	192.5	7.5	LXD1FC7
200	—	—	LXD1L7
208	417	16	LXD1LE7
220/230	539	22	LXD1M7 <sup>(3)</sup>
230	595	21	LXD1P7
230/240	645	25	LXD1U7 <sup>(4)</sup>
277	781	30	LXD1W7
380/400	1580	60	LXD1Q7
400	1810	64	LXD1V7
415	1938	74	LXD1N7
440	2242	79	LXD1R7
480	2300	85	LXD1T7
500	2499	—	LXD1S7
575	3294	—	LXD1SC7
600	3600	135	LXD1X7
690	5600	190	LXD1Y7

<sup>(1)</sup> The last 2 digits in the reference represent the voltage code.

<sup>(2)</sup> Voltage for special coils fitted in control relays with serial timer module with 24 V supply.

<sup>(3)</sup> This coil can be used on 240 V at 60 Hz.

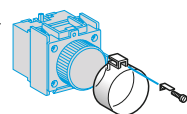
<sup>(4)</sup> This coil can be used on 230/240 V at 50 Hz and on 240 V only at 60 Hz.

PB121532.eps



LA9D901

810536.eps



PB113024\_R.eps



LAD9ET1S

PB121531.eps



LXD1







## Technical Data for Designers

### Contents

#### TeSys SK:

- > characteristics ..... B7/14 and B7/15
- > dimensions ..... B7/16
- > schemes ..... B7/17

#### TeSys K:

- > characteristics ..... B7/18 and B7/19
- > dimensions ..... B7/20
- > schemes ..... B7/21

#### TeSys D:

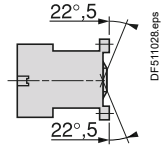
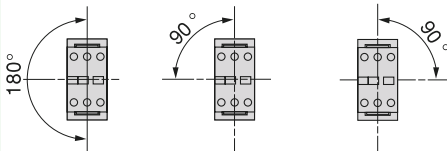
- > characteristics ..... B7/22 to B7/24
- > curves ..... B7/25
- > dimensions ..... B7/26
- > schemes ..... B7/27



# TeSys

## TeSys SK, SKE Mini-control relays

### Characteristics

Environment					
Rated insulation voltage (Ui)	Conforming to IEC 60947, CSA 22-2 n° 14, UL 508	V	690		
Conforming to standards			IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5		
Approvals			cULus, CCC, EAC, CB certification		
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP2X		
Ambient air temperature around the device	Storage	°C	-50...+70		
	Operation	°C	-20...+50		
Maximum operating altitude	Without derating	m	2000		
Operating position		<div>Vertical axis</div>  <div>Without derating</div>		<div>Horizontal axis</div>  <div>Without derating</div>	
Connection by connectors			Min.	Max.	
	Solid cable	mm²	1 x 1.5 or 2 x 1.5	1 x 6 or 2 x 4	
	Flexible cable without cable end	mm²	1 x 0.5 or 2 x 0.35	1 x 6 or 2 x 2.5	
	Flexible cable with cable end	mm²	1 x 0.35 or 2 x 0.35	1 x 6 or 2 x 1.5	
Tightening torque	Pozidriv n° 1 head	N.m	0.8		
Terminal referencing	Conforming to standards EN 50005 and EN 50011		Up to 4 contacts		

Control circuit characteristics					
Control relay			CA2SK	CA2SKE	CA3SK
Rated control circuit voltage (Uc)		V	~ 24...400		~ 12...72
Control voltage limits (≤ 50 °C)	For operation		0.85...1.1 Uc		0.85...1.1 Uc
	For drop-out		≤ 0.20 Uc		≤ 0.10 Uc
Average consumption at 20 °C and at Uc	Inrush		16 VA	23 VA	2.2 W
	Sealed		4.2 VA	4.9 VA	2.2 W
Heat dissipation		W	1.4	1.5	2.2
Operating time at 20 °C and at Uc	Between coil energisation and opening of the N/C contacts	ms	8...16		10...18
		ms	7...14		8...12
	Between coil de-energisation and opening of the N/O contacts	ms	6...8		4...6
		ms	8...10		6...8
Maximum operating rate	In operating cycles per hour		1200		1200
Mechanical durability at Uc in millions of operating cycles	50/60 Hz coil		10		—
	Standard ~ coil		—		10

Ref.



Control relays



# TeSys

## TeSys SK, SKE Mini-control relays

### Characteristics

Auxiliary contact characteristics of mini-control relays and instantaneous contact blocks														
Rated operational voltage (Ue)		V	Up to 690											
Rated insulation voltage (Ui)	Conforming to IEC 96047	V	690											
Conventional rated thermal current (Ith)	For ambient temperature ≤ 55 °C	A	10											
Frequency of the operational current		Hz	Up to 400											
Short-circuit protection	Conforming to IEC 60947, gl fuse	A	10											
Operational power of contacts conforming to IEC 60947														
		a.c. supply, category AC-15						d.c. supply, category DC-13						
		Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4).						Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.						
		V	24	48	110/127	220/230	380/400	440	V	24	48	110	220	440
1 million operating cycles		VA	48	96	240	440	800	880	W	120	80	60	52	51
3 million operating cycles		VA	17	34	86	158	288	317	W	55	38	30	28	26
10 million operating cycles		VA	7	14	36	66	120	132	W	15	11	9	8	7
Occasional making capacity		VA	1000	2050	5000	10000	14000	13 000	W	720	600	400	300	230

Ref.



Control  
relays



# TeSys

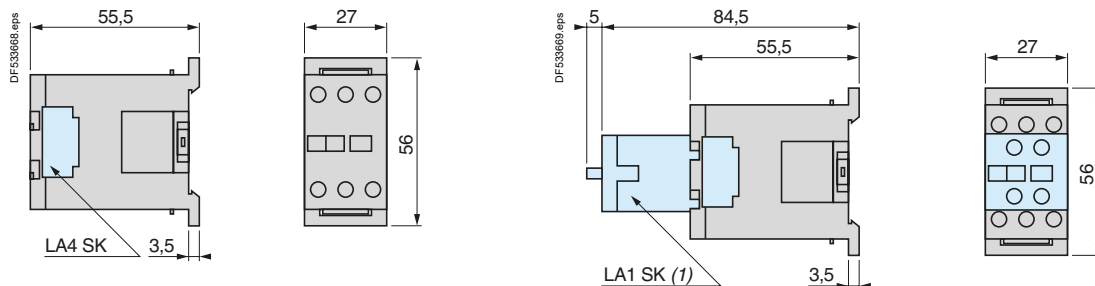
## TeSys SK, SKE Mini-control relays

### Dimensions and mounting

#### Dimensions

##### Mini-control relays

##### CA2SK and CA3SK



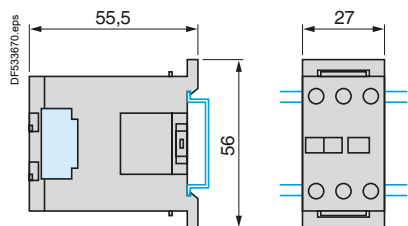
(1) Only on CA2SK20.

#### Mounting

##### Mini-control relays

##### CA2SK and CA3SK

On mounting rail NSYDR200BD or NSYDR200 (35 mm)

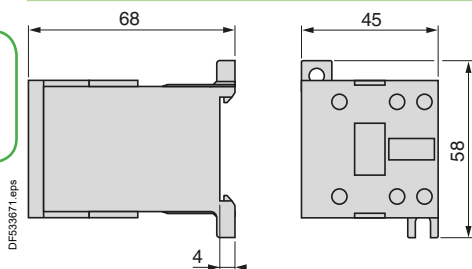


Ref.



#### Dimensions

##### CA2SKE



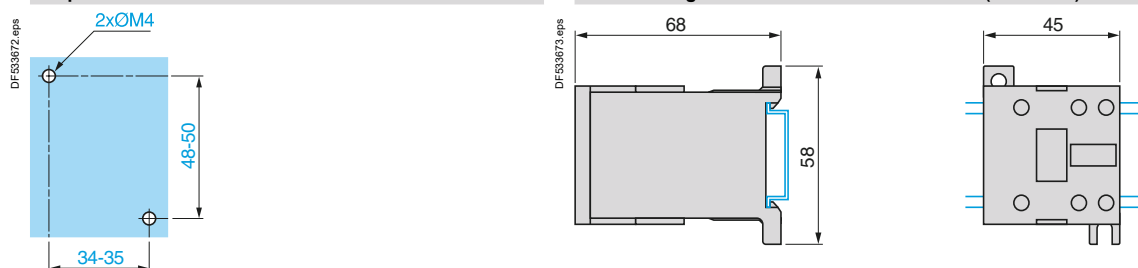
Control  
relays

#### Mounting

##### CA2SKE

On panel

On mounting rail NSYDR200BD or NSYDR200 (35 mm)

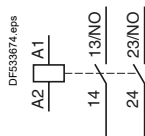




#### Schemes

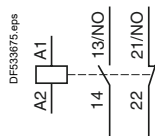
##### CA2SK20, CA3SK20

2 N/O



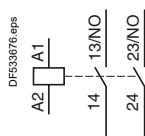
##### CA2SK11, CA3SK11

1 N/O + 1 N/C



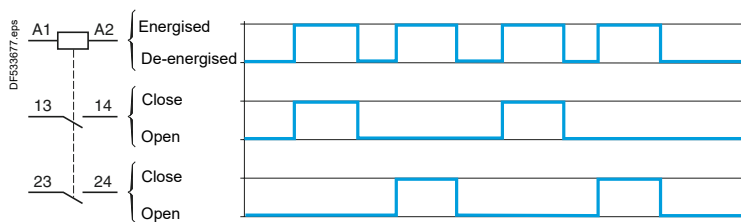
##### CA2SKE

2 N/O



##### CA2SKE

Function diagram



#### Instantaneous auxiliary contacts

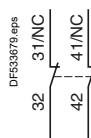
2 N/O

LA1SK20



2 N/C

LA1SK02



1 N/O + 1 N/C

LA1SK11



Ref.



Control  
relays

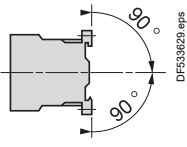
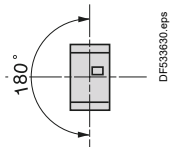
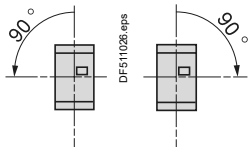


# TeSys

## TeSys K Control relays

### Characteristics

#### Environment

Conforming to standards			IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5																																														
Product certifications			UL, CSA, CCC, EAC, CB certification																																														
Operating positions			<div><div><div><b>Vertical axis</b></div><div></div><div>Without derating</div></div><div><div><b>Horizontal axis</b></div><div></div><div>Without derating</div></div><div><div></div><div>Possible positions for <b>CA2K</b> only, with derating, please consult your Regional Sales Office.</div></div></div>																																														
Connection			<table><tr><th></th><th></th><th>Min.</th><th>Max.</th><th>Max. to IEC 60947</th></tr><tr><td rowspan="3">Screw clamp connections</td><td>Solid cable</td><td>mm²</td><td>1 x 1.5</td><td>2 x 4</td><td>1 x 4 + 1 x 2.5</td></tr><tr><td>Flexible cable without cable end</td><td>mm²</td><td>1 x 0.75</td><td>2 x 4</td><td>2 x 2.5</td></tr><tr><td>Flexible cable with cable end</td><td>mm²</td><td>1 x 0.34</td><td>1 x 1.5 + 1 x 2.5</td><td>1 x 1.5 + 1 x 2.5</td></tr><tr><td rowspan="2">Spring terminals</td><td>Solid cable</td><td>mm²</td><td>1 x 0.75</td><td>1 x 1.5</td><td>2 x 1.5</td></tr><tr><td>Flexible cable without cable end</td><td>mm²</td><td>1 x 0.75</td><td>1 x 1.5</td><td>2 x 1.5</td></tr><tr><td>Faston connectors</td><td>Clip</td><td>mm</td><td colspan="3">2 x 2.8 or 1 x 6.35</td></tr><tr><td>Solder pins for printed circuit board</td><td>With locating device between power and control circuits</td><td></td><td colspan="3">4 mm x 35 microns</td></tr></table>					Min.	Max.	Max. to IEC 60947	Screw clamp connections	Solid cable	mm²	1 x 1.5	2 x 4	1 x 4 + 1 x 2.5	Flexible cable without cable end	mm²	1 x 0.75	2 x 4	2 x 2.5	Flexible cable with cable end	mm²	1 x 0.34	1 x 1.5 + 1 x 2.5	1 x 1.5 + 1 x 2.5	Spring terminals	Solid cable	mm²	1 x 0.75	1 x 1.5	2 x 1.5	Flexible cable without cable end	mm²	1 x 0.75	1 x 1.5	2 x 1.5	Faston connectors	Clip	mm	2 x 2.8 or 1 x 6.35			Solder pins for printed circuit board	With locating device between power and control circuits		4 mm x 35 microns		
		Min.	Max.	Max. to IEC 60947																																													
Screw clamp connections	Solid cable	mm²	1 x 1.5	2 x 4	1 x 4 + 1 x 2.5																																												
	Flexible cable without cable end	mm²	1 x 0.75	2 x 4	2 x 2.5																																												
	Flexible cable with cable end	mm²	1 x 0.34	1 x 1.5 + 1 x 2.5	1 x 1.5 + 1 x 2.5																																												
Spring terminals	Solid cable	mm²	1 x 0.75	1 x 1.5	2 x 1.5																																												
	Flexible cable without cable end	mm²	1 x 0.75	1 x 1.5	2 x 1.5																																												
Faston connectors	Clip	mm	2 x 2.8 or 1 x 6.35																																														
Solder pins for printed circuit board	With locating device between power and control circuits		4 mm x 35 microns																																														
Tightening torque			Philips head n° 2 and Ø6			N.m	0.8																																										
Terminal referencing			Conforming to standards EN 50005 and EN 50011				Up to 8 contacts																																										
Degree of protection			Conforming to IEC 60529				Protection against direct finger contact IP2x (devices with screw clamp terminals or pins for printed circuit board)																																										
Ambient air temperature around the device	Storage	°C	-50...+80																																														
	Operation	°C	-25...+50																																														
Maximum operating altitude	Without derating	m	2000																																														
Vibration resistance 5...300 Hz	Control relay open		2 gn																																														
	Control relay closed		4 gn																																														
Flame resistance	Conforming to IEC 60695-2-11		850 °C																																														
Shock resistance (1/2 sine wave, 11 ms)	Control relay open		10 gn																																														
	Control relay closed		15 gn																																														

#### Control circuit characteristics

Control relay type		CA2K	CA3K	CA4K
Rated control circuit voltage (Uc)	V	~ 12...690	~ 12...250	~ 12...120
Control voltage limits (y 50 °C) single voltage coil	For operation	0.8...1.15 Uc	0.8...1.15 Uc	0.7...1.3 Uc
	For drop-out	≤ 0.2 Uc	≤ 0.1 Uc	≤ 0.1 Uc
Mechanical durability at Uc In millions of operating cycles	50/60 Hz coil	10	—	—
	Standard ~ coil	—	20	—
	Wide range, low consumption ~ coil	—	—	30
Maximum operating rate	In operating cycles per hour	10 000	10 000	6000
Average consumption at 20 °C and at Uc	Inrush	30 VA	3 W	1.8 W
	Sealed	4.5 VA	3 W	1.8 W
Heat dissipation	W	1.3	3	1.8
Operating time at 20 °C and at Uc	Between coil energisation and opening of the N/C contacts	ms	5...15	25...35
		ms	10...20	30...40
	Between coil de-energisation and opening of the N/O contacts	ms	10...20	10...20
		ms	15...25	15...25
Maximum immunity to microbreaks	ms	2	2	2



#### Contact characteristics of control relays and instantaneous contact blocks

Number of auxiliary contacts	On <b>CA●K</b> On <b>LA1K</b>		4 2 or 4 for <b>CA2K</b> and <b>CA3K</b> , 2 for <b>CA4K</b>
Rated operational voltage (Ue)	Up to	V	690
Rated insulation voltage (Ui)	Conforming to IEC 60947	V	690
	Conforming to UL 60947-5-1, CSA C22.2 n° 60947-5-1	V	600
Conventional thermal current (Ith)	For ambient temperature ≤ 50 °C	A	10
Frequency of the operational current		Hz	Up to 400
Minimum switching capacity	U min	V	17
	I min	mA	5
Short-circuit protection	Conforming to IEC 60947, gG fuse	A	10
Rated making capacity	Conforming to IEC 60947 I rms	A	110
Short-time rating	Permissible for		
	1 s	A	80
	500 ms	A	90
Insulation resistance		MΩ	> 10
Non-overlap distance	CA●K and LA1K: linked contacts conforming to INRS, BIA and CNA specifications	mm	0.5 (see schemes page B7/21)

#### Operational power of contacts conforming to IEC 60947

##### a.c. supply, category AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current ( $\cos \phi 0.7$ ) = 10 times the power broken ( $\cos \phi 0.4$ )

##### d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

	V	24	48	110/ 127	220/ 230	380/ 400	440	600/ 690	V	24	48	110	220	440	600
1 million operating cycles	VA	48	96	240	440	800	880	1200	W	120	80	60	52	51	50
3 million operating cycles	VA	17	34	86	158	288	317	500	W	55	38	30	28	26	25
10 million operating cycles	VA	7	14	36	66	120	132	200	W	15	11	9	8	7	6
Occasional making capacity	VA	1000	2050	5000	10000	14000	13000	9000	W	720	600	400	300	230	200

#### 1 Breaking limit of contacts valid for:

- maximum of 50 operating cycles at 10 s intervals (power broken = making current x  $\cos \phi 0.7$ ).

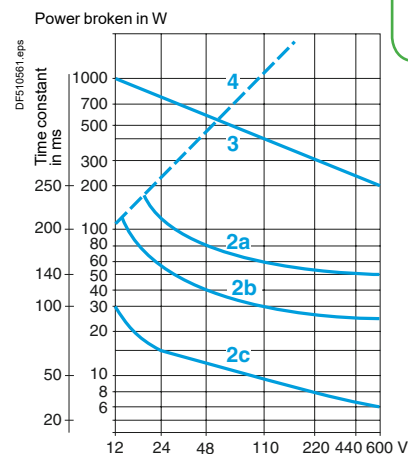
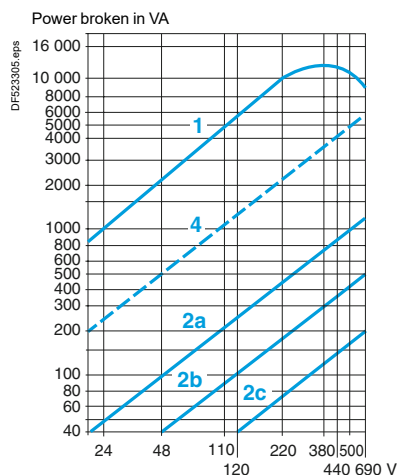
#### 2 Electrical durability of contacts for:

- 1 million operating cycles (2a)
- 3 million operating cycles (2b)
- 10 million operating cycles (2c).

#### 3 Breaking limit of contacts valid for:

- maximum of 20 operating cycles at 10 s intervals with current passing for 0.5 s per operating cycle.

#### 4 Thermal limit





# TeSys

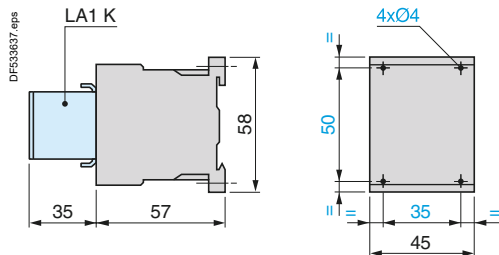
## TeSys K Control relays

### Dimensions and mounting

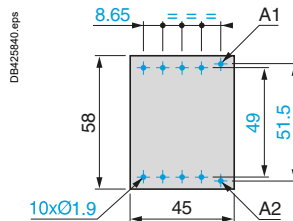
#### Control relays

##### CA2K, CA3K, CA4K

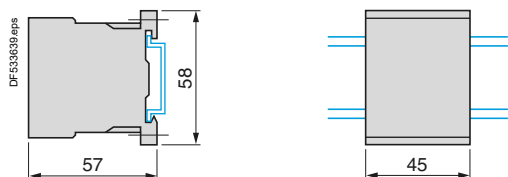
###### On panel



###### On printed circuit board

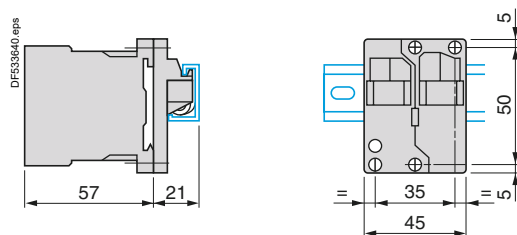


###### On mounting rail NSYDR200BD or NSYDR200 (L 35 mm)



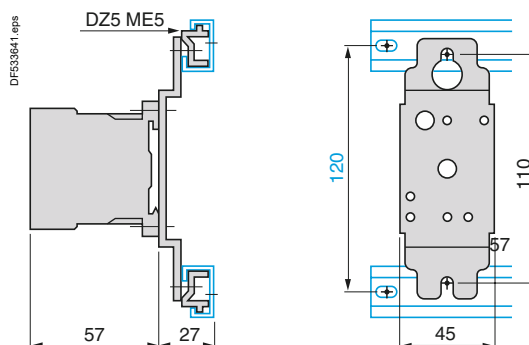
##### LA9D973

###### On asymmetrical rail with clip-on mounting plates



##### DX1AP25

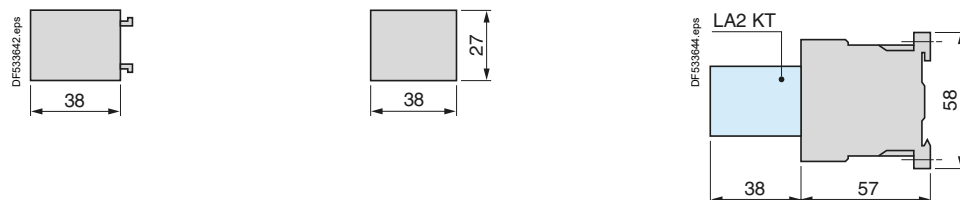
###### On asymmetrical rail with clip-on mounting plates



#### Electronic time delay contact blocks

##### LA2KT

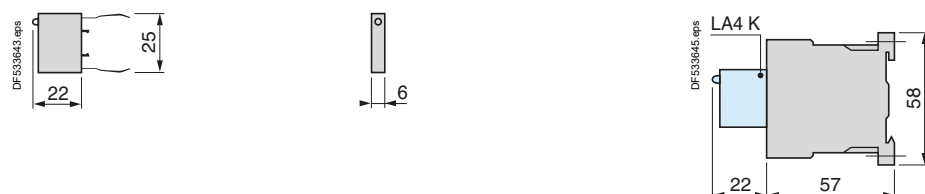
###### On control relay



#### Suppressor modules

##### LA4K

###### On control relay

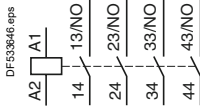




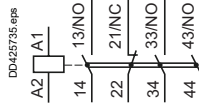
## Control relays

### CA2K, CA3K, CA4K

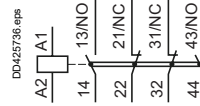
4 N/O



3 N/O + 1 N/C

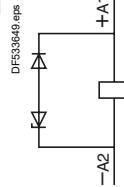


2 N/O + 2 N/C

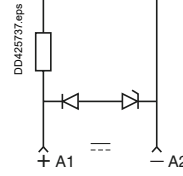


## With integral suppression device

### CA3K



### CA4K



## Instantaneous auxiliary contact blocks LA1K

### For CA2K, CA3K, CA4K

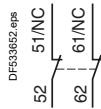
2 N/O

LA1KN20, LA1 KN207



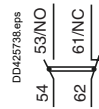
2 N/C

LA1KN02, LA1 KN027



1 N/O + 1 N/C

LA1KN11, LA1 KN117



### For CA2K, CA3K

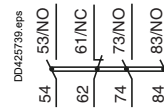
4 N/O

LA1KN40, LA1 KN407



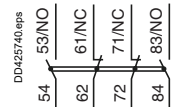
3 N/O + 1 N/C

LA1KN31, LA1 KN317



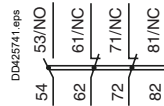
2 N/O + 2 N/C

LA1KN22, LA1KN227



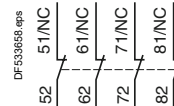
1 N/O + 3 N/C

LA1KN13, LA1KN137



4 N/C

LA1KN04, LA1KN047

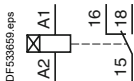


## Electronic time delay contact blocks LA2KT

### For CA2K, CA3K, CA4K

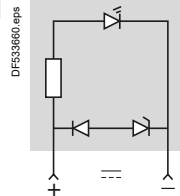
1 C/O

LA2KT2

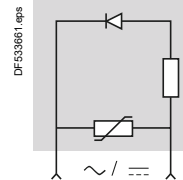


## Suppressor modules

### LA4KC



### LA4KE



Ref.



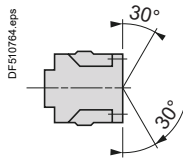
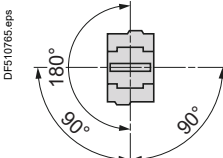
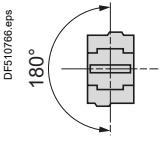


Control  
relays



# TeSys

## TeSys D Control relays

### Characteristics

Environment					
Control relay type			CAD ~	CAD ---	CAD --- low consumption
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1 Overvoltage category III and degree of pollution 3	V	690	690	690
	Conforming to UL, CSA	V	600	600	600
Rated impulse withstand voltage (Uimp)	Conforming to IEC 60947	kV	6	6	6
Separation of electrical circuits	Conforming to IEC 60536		Reinforced insulation up to 400 V		
Conforming to standards			IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5		
Product certifications			UL, CSA, CCC, EAC, CB certification, EU-MR-RO by DNV-GL		
Degree of protection	Conforming to IEC 60529		Front face protected against direct finger contact IP 2X		Protection against direct finger contact IP 2X
Ambient air temperature around the device	Storage	°C	-60...+80		
	Operation <sup>(1)</sup>	°C	-40...+60		
	Allowed <sup>(1)</sup>	°C	+60...+70 at Uc to 1,●● x Uc		
Maximum operating altitude	Without derating	m	3000	3000	3000
Operating positions	Without derating in the following positions				
	Positions that are not allowed				
Shock resistance <sup>(2)</sup> half sine wave for 11ms	Control relay open		10 gn	10 gn	10 gn
	Control relay closed		15 gn	15 gn	15 gn
Vibration resistance <sup>(2)</sup> 5...300 Hz	Control relay open		2 gn	2 gn	2 gn
	Control relay closed		4 gn	4 gn	4 gn
Screw clamp connections	Flexible conductor without cable end	1 conductor	mm <sup>2</sup>	1...4	1...4
		2 conductors	mm <sup>2</sup>	1...4	1...4
	Flexible conductor with cable end	1 conductor	mm <sup>2</sup>	1...4	1...4
		2 conductors	mm <sup>2</sup>	1...2.5	1...2.5
	Solid conductor without cable end	1 conductor	mm <sup>2</sup>	1...4	1...4
		2 conductors	mm <sup>2</sup>	1...4	1...4
	Tightening torque	N.m	1.7	1.7	1.7
Spring terminal connections	1 or 2 flexible or rigid conductors without cable end	mm <sup>2</sup>	1...2.5	1...2.5	1...2.5

(1) As per IEC60947-1, operating time and drop out voltage given and tested for -5...+40 °C.  
 (2) In the least favourable direction, without change of contact state, with coil supplied at Uc.



# TeSys

## TeSys D Control relays

### Characteristics

Control circuit characteristics					
Control relay type			CAD ~	CAD ≡	CAD low consumption
Rated control circuit voltage (Uc)		V	12...690	12...440	≡ 5...72
Control voltage limits					
Operation	With coil 50/60 Hz		0.8...1.1 Uc at 50 Hz	—	—
			0.85...1.1 Uc at 60 Hz	—	—
	With standard coil, wide range		—	0.7...1.25 Uc	0.7...1.25 Uc
Drop-out			0.3...0.6 Uc	0.1...0.25 Uc	0.1...0.25 Uc
Average consumption at 20 °C and at Uc		~ 50/60 Hz (at 50 Hz)	VA	Inrush: 70	—
				sealed: 8	—
	With standard coil	W	—	Inrush or sealed: 5.4	Inrush or sealed: 2.4
Operating time (at rated control circuit voltage and at 20 °C)	Between coil energisation and - opening of the N/C contacts	ms	4...19	55 ± 15 %	67 ± 15 %
	- closing of the N/O contacts	ms	12...22	63 ± 15 %	77 ± 15 %
	Between coil de-energisation and - opening of the N/O contacts	ms	4...12	20 ± 20 %	27 ± 20 %
	- closing of the N/C contacts	ms	6...17	25 ± 20 %	35 ± 20 %
Short supply failure	Maximum duration without affecting hold-in of the device	ms	2	2	2
Maximum operating rate	In operating cycles per second		3	3	3
Mechanical durability In millions of operating cycles	With coil 50/60 Hz (at 50 Hz)		30	—	—
	With standard coil ≡ wide range		—	30	30
Time constant L/R		ms	—	28	40

Ref.



Control relays



Characteristics of instantaneous contacts incorporated in the control relay				
Number of contacts				5
Rated operational voltage (Ue)	Up to	<b>V</b>		690
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1	<b>V</b>		690
	Conforming to UL, CSA	<b>V</b>		600
Conventional thermal current (Ith)	For ambient temperature ≤ 60 °C	<b>A</b>		10
Frequency of the operational current		<b>Hz</b>		25...400
Minimum switching capacity	U min	<b>V</b>		17
	I min	<b>mA</b>		5
Short-circuit protection	Conforming to IEC 60947-5-1			gG fuse: 10 A
Rated making capacity	Conforming to IEC 60947-5-1	I rms		~ 140, --- 250
Short-time rating	Permissible for	1 s	<b>A</b>	100
		500 ms	<b>A</b>	120
		100 ms	<b>A</b>	140
Insulation resistance		<b>MΩ</b>		> 10
Non-overlap time	Guaranteed between N/C and N/O contacts	<b>ms</b>		1.5 (on energisation and on de-energisation)
Tightening torque	Philips head n° 2 and Ø6	<b>N.m</b>		1.7
Non-overlap distance				Linked contacts in association with auxiliary contacts LADN
Mechanically linked contacts	Conforming to IEC 60947-5-1			The 3 N/O contacts and the 2 N/C contacts of CAD N32 are linked mechanically by one mobile contact carrier.

Ref.



Control  
relays

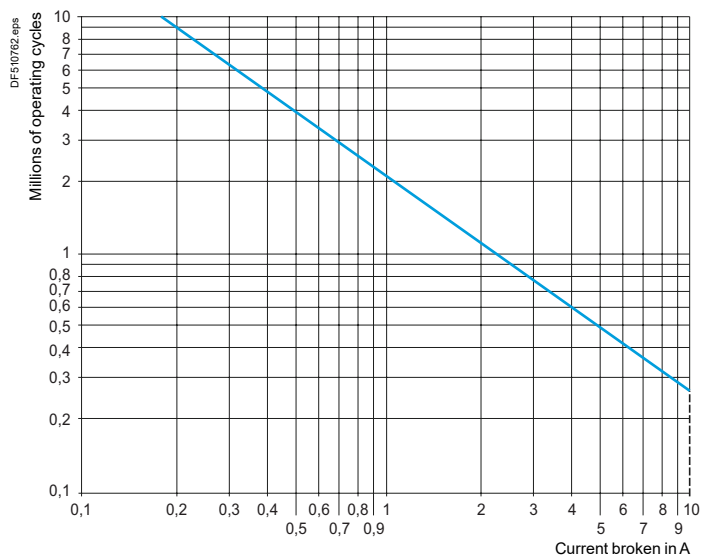


### Rated operational power of contacts (conforming to IEC 60947-5-1)

#### a.c. supply, categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet:  
making current ( $\cos \varphi 0.7$ ) = 10 times the power broken ( $\cos \varphi 0.4$ ).

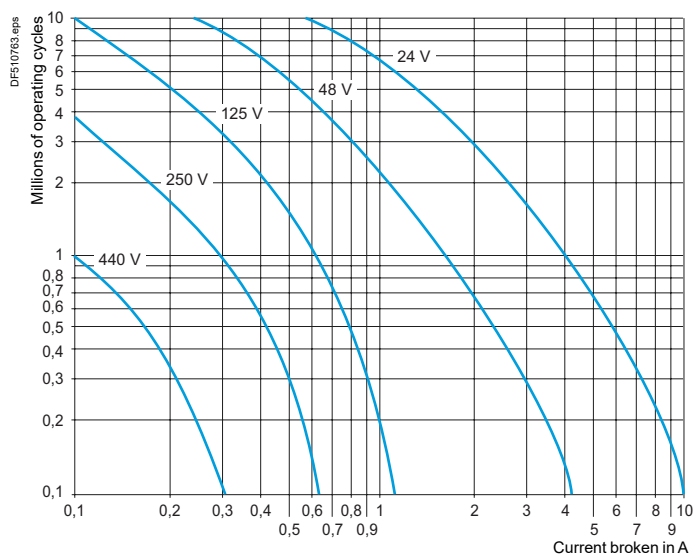
	V	24	48	115	230	400	440	600
1 million operating cycles	VA	60	120	280	560	960	1050	1440
3 million operating cycles	VA	16	32	80	160	280	300	420
10 million operating cycles	VA	4	8	20	40	70	80	100



#### d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the power.

Operating cycles	V	24	48	125	250	440
1 million	W	96	76	76	76	44
3 million	W	48	38	38	32	—
10 million	W	14	12	12	—	—





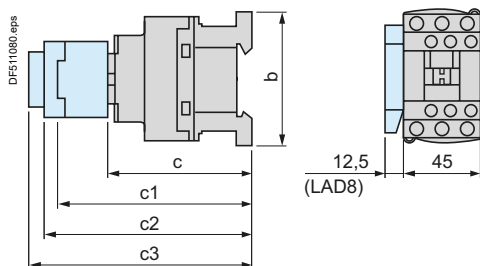
# TeSys

## TeSys D Control relays

### Dimensions and mounting

#### Dimensions

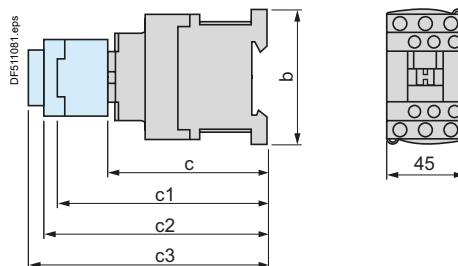
##### CAD ~



CAD	32 50	323 503
b	77	99
c without cover or add-on blocks	84	84
with cover, without add-on blocks	86	86
c1 with LADN or C (2 or 4 contacts)	117	117
c2 with LAD6K10	129	129
c3 with LADT, R, S	137	137
with LADT, R, S and sealing cover	141	141

Operating cycles	V	24	48	125	250	440
1 million	W	120	90	75	68	61
3 million	W	70	50	38	33	28
10 million	W	25	18	14	12	10

##### CAD --- or LC (low consumption)

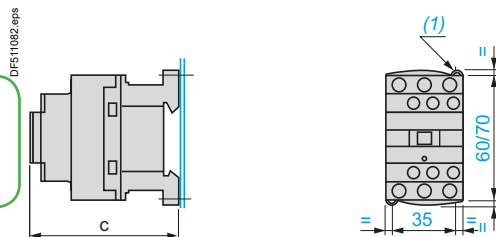


CAD	32 50	323 503
b	77	99
c without cover or add-on blocks	93	93
with cover, without add-on blocks	95	95
c1 with LADN or C (2 or 4 contacts)	126	126
c2 with LAD6K10	138	138
c3 with LADT, R, S	146	146
with LADT, R, S and sealing cover	150	150

#### Mounting

##### CAD

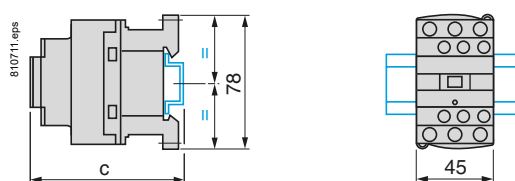
###### Panel mounted



	CAD ~	CAD --- or LC
c with cover	86	95

(1) 2 elongated holes 4.5 x 9.

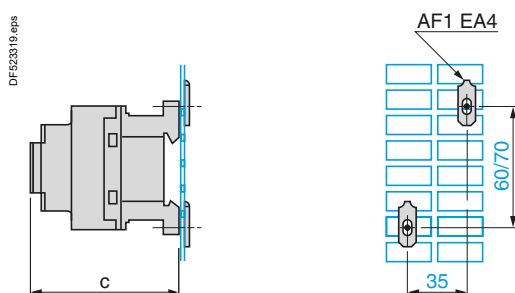
###### Mounted on rail NSYDR200BD or NSYDR200



	CAD ~	CAD --- or LC
c (NSYDR200BD) (2)	88	97
c (NSYDR200BD) (2)	96	105

(2) With cover.

###### Mounted on plate AM1P



	CAD ~	CAD --- or LC
c with cover	86	95

References:  
pages B7/9 to B7/11

Illustration:  
page B7/8

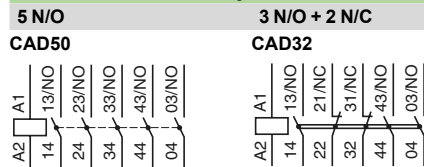
Characteristics:  
pages B7/22 to B7/24

Curves:  
page B7/25

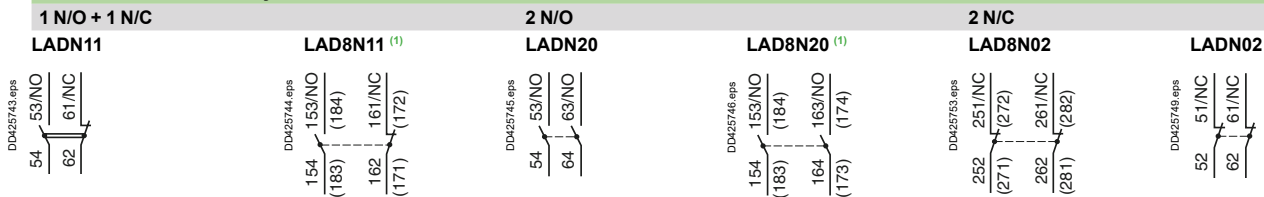
Schemes:  
page B7/27



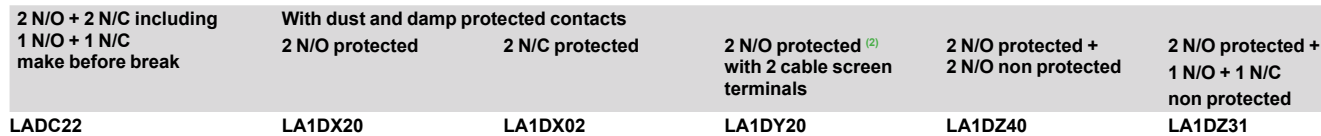
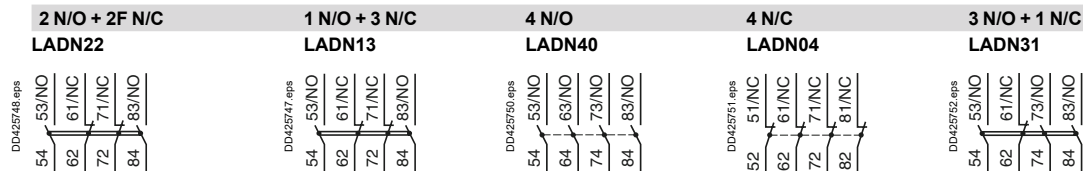
### Instantaneous auxiliary contacts



### Instantaneous auxiliary contact blocks

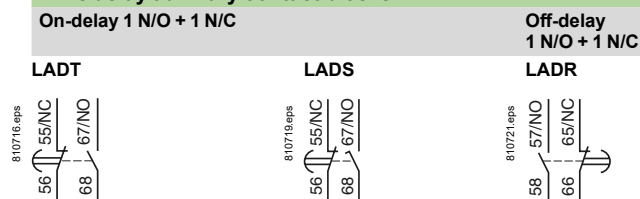


<sup>(1)</sup> The figures in brackets are for the device mounted on the RH side of the control relay.

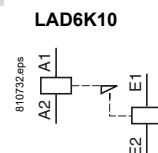


<sup>(2)</sup> Product fitted with 4 earth screen continuity terminals.

### Time delay auxiliary contact blocks



### Mechanical latch blocks





Control  
relays

B7/28

Life is On

Schneider  
Electric



TeSys D, D Green contactors			
Type of product	Range		Pages
AC/DC compatible coil contactors - TeSys D Green AC-3, AC-1, UL CSA	From 9 to 80 A		B8/2
AC-3 applications - 3-pole, 4-pole contactors	From 9 to 150 A		B8/8
AC-1 applications - 3-pole, 4-pole contactors	From 25 to 200 A		B8/9
UL CSA standards - 3-pole contactors	From 25 to 200 A		B8/14
Reversing, changeover pre-assembled contactors	From 9 to 150 A		B8/15
AC/DC compatible coil, reversing contactors - TeSys D Green	From 9 to 80 A		B8/17
Contactors for switching capacitor banks	From 12.5 to 60 kVAR		B8/20
Auxiliary contact blocks – accessories – spare coils for TeSys D, TeSys D Green			B8/22
TeSys SK, K Mini-contactors			
Mini-contactors TeSys SK	Up to 6 A		B8/37
Mini-contactors TeSys K	From 6 to 16 A		B8/39
Reversing pre-assembled mini-contactors TeSys K	From 6 to 16 A		B8/43
Auxiliary contact blocks - accessories			B8/48
	S207 Contactors for railways applications. Click on image to download.		
	S335 Contactors for electrodomestic application. Click on image to download.		
Contactors for use in modular enclosures / Din rail			
Mini-contactors TeSys SKGC	Up to 20 A		B8/51
Modular contactors TeSys GC	From 16 to 100 A		B8/53
Dual tariff contactors TeSys GY	16, 25, 40 or 100 A		B8/54
Impulse relay TeSys GF	Up to 16 A		B8/55
Auxiliary contact blocks - accessories TeSys GC, GY			B8/56
Technical Data for Designers			B8/57



# TeSys

## TeSys D Contactors

### Introduction

#### TeSys D Green, enriching TeSys D family

TeSys D conventional contactors 9 to 150 A, for motor control and other applications.

TeSys D Green delivers a consistent low consumption range of contactors from 9 A to 80 A, covering control voltage from 24 to 250 V, with same coils for AC and DC.



When implemented with other Schneider Electric products\*, TeSys D Green contactors are part of a comprehensive solution that is ideal for all types of industrial machines and processes.

#### TeSys LR9D

By combining a TeSys D Green contactor with our new TeSys LR9D electronic overload relay, you will have less heat generation, and further reduce energy consumption.



\* such as PLC I/O type M580, M340, M221 or M241 or extended I/O type Advantys STB range, or in association with electronic overload relays LR9D or TeSys T.



# TeSys

## TeSys D Contactors

### Introduction



### Highly competitive coil consumption

Small changes can generate big savings. The new TeSys D Green contactor is equipped with an innovative electronic coil. These electronic-coil contactors require **up to 80 % less energy** than electro-mechanical contactors. This innovation results in concrete values: for example, large plants can noticeably reduce their energy bills and heat dissipation in cabinet.

Available in



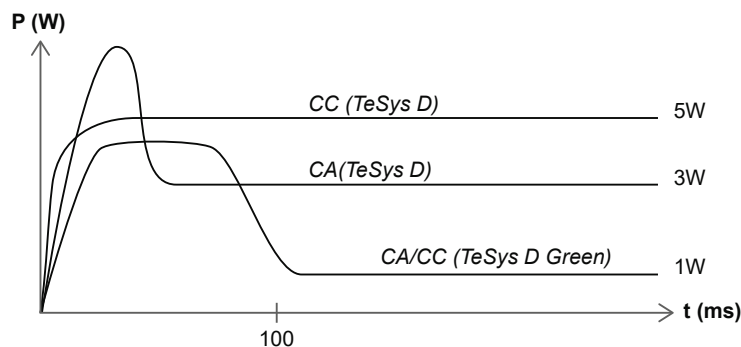
09-12-18 A

25-32-38 A

40-50-65-80 A

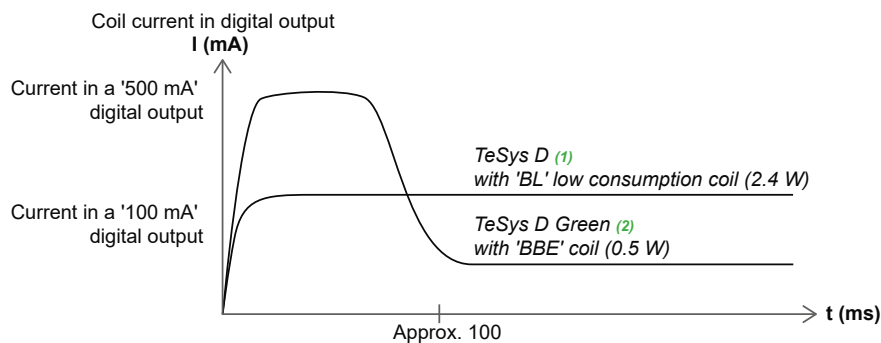
### Coil currents comparison

TeSys D Green (AC/DC coil) vs TeSys D (AC, DC coils)



TeSys D Green brings a significant reduction of energy consumption.

### TeSys D Green ("BBE" coil) vs TeSys D (low consumption "BL" coil)



(1) Up to 38 A.  
(2) 40 to 80 A.

TeSys D Green is well adapted to direct control by PLC static outputs, even in its high ratings.



# TeSys

## TeSys D Green Contactors

### Product references



LC1D09...



LC1D40A...

TeSys D Green contactors have a dark grey casing and a 3-character code voltage.

### 3-pole contactors - Motor control up to 37 kW / 400 V - Category AC-3

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 ( $\theta \leq 60^\circ\text{C}$ )						Rated opera- tional current in AC-3 440 V up to	Instan- taneous auxiliary contacts	Basic reference, to be completed by adding the control voltage code	Weight
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V	A		Fixing <sup>(1)</sup>	

kW	kW	kW	kW	kW	kW	A			kg
----	----	----	----	----	----	---	--	--	----

#### Connection by screw clamp terminals

2.2	4	4	4	5.5	5.5	9	1	1	LC1D09...	0.368
3	5.5	5.5	5.5	7.5	7.5	12	1	1	LC1D12...	0.373
4	7.5	9	9	10	10	18	1	1	LC1D18...	0.378
5.5	11	11	11	15	15	25	1	1	LC1D25...	0.433
7.5	15	15	15	18.5	18.5	32	1	1	LC1D32...	0.438
9	18.5	18.5	18.5	18.5	18.5	38	1	1	LC1D38...	0.442

#### Power connections by EverLink® BTR <sup>(2)</sup> screw connectors and control by screw clamp terminal

11	18.5	22	22	22	30	40	1	1	LC1D40A...	0.992
15	22	25	30	30	33	50	1	1	LC1D50A...	0.997
18.5	30	37	37	37	37	65	1	1	LC1D65A...	1.002
22	37	37	37	37	37	66	1	1	LC1D80A...	1.002

#### Connection for lugs or bars <sup>(4)</sup>

For LC1D40A to LC1D80A, insert a figure 6 before the voltage code.

Example: LC1D40A... becomes LC1D40A6...

### Auxiliary contact blocks and add-on modules

See pages B8/22 to B8/28.

### Control voltage codes

#### AC/DC or 24 V DC supply

Volts	24 (DC only)	24-60	48-130	100-250
-------	--------------	-------	--------	---------

LC1D09 ... D38,  
LC1D40A ... D80A

U 0.85...1.1 Uc		BNE	EHE	KUE
-----------------	--	-----	-----	-----

LC1D09 ... D38

U 0.8 ... 1.2 Uc	BNE			
------------------	-----	--	--	--

LC1D40A ... D80A

U 0.8...1.2 Uc	BBE			
----------------	-----	--	--	--

<sup>(1)</sup> LC1D09 to D80A: clip-on mounting on 35 mm rail NSYSR or screw fixing.

<sup>(2)</sup> BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see B8/28).

<sup>(3)</sup> Please consult your Regional Sales Office.





# TeSys

## TeSys D Green Contactors

### Product references



LC1D09●●●



LC1D40A●●●



LC1DT60A●●●

TeSys D Green contactors have a dark grey casing and a 3-character code voltage.

### 3-pole contactors - Load control from 25 to 80 A - Category AC-1

Non inductive loads ( $\theta \leq 60^\circ\text{C}$ ) utilisation category AC-1	Number of poles	Instan- taneous auxiliary contacts	Partial reference, to be completed by adding the control voltage code	Weight
			Fixing <sup>(1)</sup>	

A kg

#### Connection by screw clamp terminals

25	3	1	1	LC1D09●●●	0.368
				or LC1D12●●●	0.373
32	3	1	1	LC1D18●●●	0.378
40	3	1	1	LC1D25●●●	0.433
50	3	1	1	LC1D32●●●	0.438
				or LC1D38●●●	0.442

#### Connection by EverLink®, BTR screw connectors <sup>(2)</sup>

60	3	1	1	LC1D40A●●●	0.992
80	3	1	1	LC1D50A●●●	0.997
				or LC1D65A●●● <sup>(3)</sup>	1.002
				or LC1D80A●●● <sup>(3)</sup>	1.002

#### Connection for lugs or bars

For LC1D40A to LC1D80A, insert a figure 6 before the voltage code.

Example: LC1D40A●●● becomes LC1D40A6●●●

### 4-pole contactors

#### Connection by EverLink®, BTR <sup>(2)</sup> screw connectors

60	4	1	1	LC1DT60A●●●	1.230
80	4	1	1	LC1DT80A●●●	1.290

#### Connection for lugs or bars

For LC1DT60A to LC1DT80A, insert a figure 6 before the voltage code.

Example: LC1DT60A●●● becomes LC1DT60A6●●●

### 4-pole changeover contactors

#### Connection by EverLink®, BTR <sup>(2)</sup> screw connectors

60	4	1	1	LC2DT60A●●●	2.460
80	4	1	1	LC2DT80A●●●	2.580

### Control voltage codes

#### AC/DC 24 V DC supply

Volts	24 (DC only)	24-60	48-130	100-250
LC1D09...D80A and LC●DT60A...DT80A				
U 0.85 .... 1.1 Uc		BNE	EHE	KUE
LC1D09 .... D38				
U 0.8 .... 1.2 Uc	BNE			
LC1D40 to LC1D80A, LC●DT60A to LC●DT80A				
U 0.8...1.2 Uc	BBE			

<sup>(1)</sup> LC1D09 to D80A, LC●DT60A and LC●DT80A: clip-on mounting on 35 mm rail NSYS DR or screw fixing.

<sup>(2)</sup> BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/28).

<sup>(3)</sup> Coordination tables according to the number of operation cycles, consult online datasheets for values.



# TeSys

## TeSys D Green Contactors

### Product references



LC1D09...



LC1D40A...



Contactors

TeSys D Green contactors have a dark grey casing and a 3-character code voltage.

### 3-pole contactors conforming to UL and CSA standards (North American market) - 25 to 80 A

Standard power ratings of motors 50/60 Hz						Associated cable type 75 °C-Cu	Continuous current	Type of contactor required Partial reference, to be completed by adding the control voltage code
Single-phase 1 Ø		3-phase 3 Ø						
115 V	230 V	200 V	230 V	460 V	575 V			
								Fixing, connection <sup>(1)</sup>

HP HP HP HP HP HP A

#### Connection by screw clamp terminals

1/3	1	2	2	5	7.5	AWG 18 - 10	25	LC1D09...
0.5	2	3	3	7.5	10	AWG 18 - 10	25	LC1D12...
1	3	5	5	10	15	AWG 18 - 8	32	LC1D18...
2	3	7.5	7.5	15	20	AWG 14 - 6	40	LC1D25...
2	5	10	10	20	25	AWG 14 - 6	50	LC1D32...

#### Power connections by EverLink® BTR <sup>(2)</sup> screw connectors and control by spring terminals

3	5	10	10	30	30	AWG 16 - 2	60	LC1D40A...
3	7.5	15	15	40	40	AWG 16 - 2	70	LC1D50A...
5	10	20	20	40	50	AWG 16 - 2	80	LC1D65A...
5	10	20	20	40	50	AWG 16 - 2	80	LC1D80A...

#### Connection for lugs or bars

For LC1D40A to LC1D80A, insert a figure 6 before the voltage code.

Example: LC1D40A... becomes LC1D40A6...

### Applications with High-Fault Short-Circuit Current ratings

High-fault short-circuit current ratings are: 100 kA at 600 V with Class J fuses and 85 kA (D09-38), 100 kA (D40A-65A) at 480 V and 50 kA at 600 V with circuit breakers.

### Control voltage codes

#### AC/DC 24 V DC supply

Volts	24 (DC only)	24-60	48-130	100-250
LC1D09 ... D32, LC1D40A ... D80A				
U 0.85 ... 1.1 Uc		BNE	EHE	KUE
LC1D09 ... D38				
U 0.8 ... 1.2 Uc		BNE		
LC1D40A ... D80A				
U 0.8...1.2 Uc		BBE		

<sup>(1)</sup> LC1D09 to D80: clip-on mounting on 35 mm rail NSYSR or screw fixing.

<sup>(2)</sup> BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/28).





TeSys D Green contactors - Coordination with PLC output modules  
(static/relay/triac)

### Selection of PLC coordinated contactors

Laboratory tests have been carried out in order to validate trouble free contactor closings and openings with different PLC output modules.  
The coil must be defined according to the contactor rating range and output module.  
See selection table below.

The PLC your are using				>>>	Compatible contactors <sup>(1)</sup>	Coil code
PLC type	Output type	Output I (A)	Output module commercial reference			
M221 / M241 / M251	Static output: 24 V DC	0.5	TM3DQ8●●● and Q16●●● (T, TG, U, UG)	>>>	LC1D09●● to LC1D38●●, LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●●	BL, BNE BBE
		0.3 (sealed) 0.8 (inrush)	TM3XTYS4	>>>	LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●●	BBE, BD, BNE
		0.1	TM3DQ16●● and Q32●● (TK, UK)	>>>	LC1D09●● to LC1D38●●	BL
	Relay output: 24 V DC / 230 V AC	2	TM3DQ8 and DQ16 (R,RG), TM3DM8 and DM24 (R,RG)	>>>	LC1D09●● to LC1D38●●, LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●●	Code of any DC coil up to 24 V or any AC coil up to 230 V
M340 / M580	Static output: 24 V DC	0.5	BMXDDO1602 and DM16022	>>>	LC1D09●● to LC1D38●●, LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●●	BL, BNE BBE
		0.1	BMXDDO3202, BMXDDM3202K, BMXDDO6402K	>>>	LC1D09●● to LC1D38●●	BL
	Relay output: 24 V DC / 230 V AC	2	BMXDRA0805 and DM16025	>>>	LC1D09●● to LC1D38●●, LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●●	Code of any DC coil up to 24 V or any AC coil up to 230 V
	Triac output: 230 V AC	0.6	BMXDAO1605	>>>	LC1D09●● to LC1D38●●, LC1D40●●● to LC1D80A●●●, LC1DT60A●●● to LC1DT80A●●●	Code of any AC coil up to 230 V (P7 code = 230 V)
ADVANTYS	Static output: 24 V DC	0.5	STBDDO3200	>>>	LC1D09●● to LC1D38●●, LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●●	BL, BNE BBE
	Triac output: 230 V AC	2	STBDAO8210	>>>	LC1D09●● to LC1D38●●, LC1D40A●●● to LC1D80A, LC1DT60A●●● to LC1DT80A●●●	Code of any AC coil up to 230 V (P7 code = 230 V AC)

### Coils consumption characteristics

Coil type	Uc DC - min -max	Average consumption at UC DC / 20 °C	
		Inrush	Sealed
BL	24 V - 0.8 Uc to 1.1 Uc	2.4 W - 2.4 VA	2.4 W - 2.4 VA
BNE		14 W - 14 VA	0.7 W - 0.7 VA
BBE		11 W - 11 VA	0.5 W - 0.5 VA

(1) Replace dot by coil code. Ex LC1D09●● becomes LC1D09BL.



# TeSys

## TeSys D Contactors

### Product references



LC1D09●●



LC1D25●●



LC1D80A●●



LC1D95●●



LC1D115●●

### 3-pole contactors - Motor control up to 75 kW at 400 V, in category AC-3

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 (θ ≤ 60 °C)							Rated opera- tional current in AC-3 440 V up to			Basic reference, to be completed by adding the control voltage code	Weight ( <sup>2</sup> )
										Fixing <sup>(1)</sup>	
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V	1000 V					
kW	kW	kW	kW	kW	kW	kW	A				kg
Connection by screw clamp terminals											
2.2	4	4	4	5.5	5.5	–	9	1	1	LC1D09●●	0.320
3	5.5	5.5	5.5	7.5	7.5	–	12	1	1	LC1D12●●	0.325
4	7.5	9	9	10	10	–	18	1	1	LC1D18●●	0.330
5.5	11	11	11	15	15	–	25	1	1	LC1D25●●	0.370
7.5	15	15	15	18.5	18.5	–	32	1	1	LC1D32●●	0.375
9	18.5	18.5	18.5	18.5	18.5	–	38	1	1	LC1D38●●	0.380
Power connections by EverLink® BTR screw connectors <sup>(3)</sup> and control by screw clamp terminal											
11	18.5	22	22	22	30	–	40	1	1	LC1D40A●●	0.850
15	22	25	30	30	33	–	50	1	1	LC1D50A●●	0.855
18.5	30	37	37	37	37	–	65	1	1	LC1D65A●●	0.860
22	37	37	37	37	37	–	66	1	1	LC1D80A●●	0.860
Connection by screw clamp terminals or connectors											
22	37	45	45	55	45	45	80	1	1	LC1D80●●	1.590
25	45	45	45	55	45	45	95	1	1	LC1D95●●	1.610
30	55	59	59	75	80	65	115	1	1	LC1D115●●	2.500
40	75	80	80	90	100	75	150	1	1	LC1D150●●	2.500

### Connection by lugs or bars

In the references selected above, insert a figure 6 before the voltage code.

Example: LC1D09●● becomes LC1D096●●.

### Separate components

**Auxiliary contact blocks and add-on modules:** see pages B8/22 to B8/28.

(<sup>1</sup>) LC1D09 to D80A: clip-on mounting on 35 mm rail NSYSR or screw fixing.

LC1D80 to D95 ~: clip-on mounting on 35 mm rail NSYSR or 75 mm rail AM1DL or screw fixing.

LC1D80 to D95 ~: clip-on mounting on 75 mm rail AM1DL or screw fixing.

LC1D115 and D150: clip-on mounting on 2 x 35 mm rails NSYSR or screw fixing.

### Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

#### a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
LC1D09...D150 (D115 and D150 coils with built-in suppression as standard, by bi-directional peak limiting diode).													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	S7
LC1D09...D65 (not available with "connection for lugs or bars")													
50 Hz	B5	D5	E5				P5						
LC1D80...D115													
50 Hz	B5	D5	E5	F5	FE5	M5	P5	U5	Q5	V5	N5	R5	S5
60 Hz	B6	—	E6	F6	—	M6	—	U6	Q6	—	—	R6	—

#### d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC1D09...D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.7...1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
LC1D40A...D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.75...1.25 Uc	JD	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	RD
LC1D80...D95											
U 0.85...1.1 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
U 0.75...1.2 Uc	JW	BW	CW	EW	—	SW	FW	—	MW	—	—
LC1D115 and D150 (coil with built-in suppression device as standard)											
U 0.75...1.2 Uc	—	BD	—	ED	ND	SD	FD	GD	MD	UD	RD

#### Low consumption

Volts	5	12	20	24	48	110	220	250
LC1D09...D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)								
U 0.8...1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL

#### a.c. / d.c. supply - low consumption

See TeSys D Green, page B8/4

For other voltages between 5 and 690 V, see pages B8/31 to B8/34.

(<sup>2</sup>) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from LC1D09 to D38, 0.075 kg from LC1D40A to D80A and 1 kg for LC1D80 and D95.

(<sup>3</sup>) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/28).

(<sup>4</sup>) For these coil voltages, choose from TeSys D Green contactors. Same product ref. radical, just add BBE coil voltage code for 24 V DC, BNE for 24-60V AC/DC, EHE for 48-130 V AC/DC, KUE for 100-250 V AC/DC. Example: LC1D40ABBE.





LC1D123●●



LCD80A3●●

### 3-pole contactors - Motor control up to 30 kW at 400 V, in category AC-3

Standard power ratings of 3-phase motors  
50-60 Hz in category AC-3  
( $\theta \leq 60^\circ\text{C}$ )

Rated  
operational  
current in  
AC-3 440 V  
up to

Instan-  
taneous  
auxiliary  
contacts

Basic reference,  
to be completed by adding  
the control voltage code

Fixing <sup>(1)</sup>

220 V 380 V 415 V 440 V 500 V 660 V 1000 V  
230 V 400 V 690 V

kW kW kW kW kW kW kW A

#### Power and control connections by spring terminals

2.2	4	4	4	5.5	5.5	9	1	1	LC1D093●●
3	5.5	5.5	5.5	7.5	7.5	12	1	1	LC1D123●●
4	7.5	9	9	10	10	18	1	1	LC1D183●●
5.5	11	11	11	15	15	25	1	1	LC1D253●●
7.5	15	15	15	18.5	18.5	32 <sup>(2)</sup>	1	1	LC1D323●●

#### Power connections by EverLink® BTR screw connectors <sup>(3)</sup> and control by spring terminals

11	18.5	22	22	22	30	40	1	1	LC1D40A3●●
15	22	25	30	30	33	50	1	1	LC1D50A3●●
18.5	30	37	37	37	37	65	1	1	LC1D65A3●●
22	37	37	37	37	37	66	1	1	LC1D80A3●●

#### Connection by Faston connectors

These contactors are fitted with Faston connectors: 2 x 6.35 mm on the power poles and 1 x 6.35 mm on the coil and auxiliary terminals.

For contactors LC1D09 and LC1D12 only, replace the figure 3 with a 9 in the references selected above.

Example: LC1D093●● becomes LC1D099●●.

### Separate components

**Auxiliary contact blocks and add-on modules:** see pages B8/22 to B8/28.

<sup>(1)</sup> LC1D09 to D32: clip-on mounting on 35 mm rail NSYSDR or screw fixing.

### Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

#### a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440
LC1D09...D80A												
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7

#### d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC1D09...D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.7...1.25 U <sub>c</sub>	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
LC1D40A...D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.75...1.25 U <sub>c</sub>	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD

#### Low consumption

Volts	5	12	20	24	48	110	220	250
LC1D09...D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)								
U 0.8...1.25 U <sub>c</sub>	AL	JL	ZL	BL	EL	FL	ML	UL

For other voltages between 5 and 690 V, see pages B8/31 to B8/34.

<sup>(2)</sup> Must be wired with 2 x 4 mm<sup>2</sup> cables in parallel on the upstream side. On the downstream side, outgoing terminal block LAD331 may be used (Quickfit technology, see page B1/18). When wired with a single cable, the product is limited to 25 A (11 kW/400 V motors).

<sup>(3)</sup> BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/28).



# TeSys

## TeSys D Contactors

### Product references

PB121364\_aps



LC1D09●●

PB120691\_aps



LC1D80A●●



Contactors

For other voltages between 5 and 690 V, see pages B8/31 to B8/34.

- (1) **LC1D09 to D80A**: clip-on mounting on 35 mm rail **NSYSR** or screw fixing.  
**LC1D80 and D95**: clip-on mounting on 35 mm rail **NSYSR** or 75 mm rail **AM1DL** or screw fixing.  
**LC1** or **LP1D80 to D95**: clip-on mounting on 75 mm rail **AM1DL** or screw fixing.  
**LC1D115 and D150**: clip-on mounting on 2 x 35 mm rails **NSYSR** or screw fixing.
- (2) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from **LC1D09** to **D38**, 0.075 kg from **LC1D40A** to **D80A** and 1 kg for **LC1D80** and **D95**.
- (3) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).
- (4) Coordination tables according to the number of operating cycles, see AC-1 curve, page A6/40.
- (5) 32 A with 2 x 4 mm<sup>2</sup> cables connected in parallel.
- (6) For these coil voltages, choose from TeSys D Green contactors. Same product ref. radical, just add BBE coil voltage code for 24 V DC, BNE for 24-60 V AC/DC, EHE for 48-130 V AC/DC, KUE for 100-250 V AC/DC. Example: **LC1D40ABBE**.

### 3-pole contactors - Load control from 25 to 200 A in category AC-1

Non inductive loads maximum current (θ ≤ 60 °C) utilisation category AC-1	Number of poles	Instantaneous auxiliary contacts	Basic reference, to be completed by adding the control voltage code	Weight <sup>(2)</sup>
			Fixing <sup>(1)</sup>	

A kg

#### Connection by screw clamp terminals

25	3	1	1	<b>LC1D09●●</b>	0.320
				or <b>LC1D12●●</b>	0.325
32	3	1	1	<b>LC1D18●●</b>	0.330
40	3	1	1	<b>LC1D25●●</b>	0.370
50	3	1	1	<b>LC1D32●●</b>	0.375
				or <b>LC1D38●●</b>	0.380

#### Connection by EverLink®, BTR screw connectors <sup>(3)</sup>

60	3	1	1	<b>LC1D40A●●</b>	0.850
80	3	1	1	<b>LC1D50A●●</b>	0.855
				or <b>LC1D65A●●</b> <sup>(4)</sup>	0.860
				or <b>LC1D80A●●</b> <sup>(4)</sup>	0.860

#### Connection by screw clamp terminals or connectors

125	3	1	1	<b>LC1D80●●</b>	1.590
				or <b>LC1D95●●</b> <sup>(4)</sup>	1.610
200	3	1	1	<b>LC1D115●●</b>	2.500
				or <b>LC1D150●●</b> <sup>(5)</sup>	2.500

### 3-pole contactors for connection by lugs

In the references selected above, insert a figure **6** before the voltage code.

Example: **LC1D09●●** becomes **LC1D096●●**.

### Standard control circuit voltages

(for other voltages, please consult your Regional Sales Office)

#### a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
<b>LC1D09...D150</b> (LC1D115 and D150 coils with built-in suppression device as standard)													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	S7
<b>LC1D09...D65</b> (not available with "connection for lugs or bars")													
50 Hz	B5	D5	E5				P5						

#### LC1D80...D150

50 Hz	B5	D5	E5	F5	FE5	M5	P5	U5	Q5	V5	N5	R5	S5
60 Hz	B6	—	E6	F6	—	M6	—	U6	Q6	—	—	R6	—

#### d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
<b>LC1D09...D38</b> (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.7...1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
<b>LC1D40A...D65A</b> (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.75...1.25 Uc	JD	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	RD
<b>LC1</b> or <b>LP1D80</b> and <b>D95</b>											
U 0.85...1.1 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
U 0.75...1.2 Uc	JW	BW	CW	EW	—	SW	FW	—	MW	—	—
<b>LC1D115</b> and <b>D150</b> (coils with built-in suppression device fitted as standard)											
U 0.75...1.2 Uc	—	BD	—	ED	ND	SD	FD	GD	MD	UD	RD

#### Low consumption

Volts	5	12	20	24	48	110	220	250
<b>LC1D09...D38</b> (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)								
U 0.8...1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL





LC1D123●●



LC1D80A3●●

### 3-pole contactors - Load control from 16 to 80 A in category AC-1

Non inductive loads maximum current ( $\theta \leq 60^\circ\text{C}$ ) utilisation category AC-1	Number of poles	Instantaneous auxiliary contacts	Basic reference, to be completed by adding the control voltage code	Weight <sup>(2)</sup>
			Fixing <sup>(1)</sup>	
<b>Connection by spring terminals</b>				<b>kg</b>
16	3	1 1	LC1D093●● <sup>(3)</sup> or LC1D123●● <sup>(3)</sup>	0.320 0.325
25	3	1 1	LC1D183●● <sup>(4)</sup> or LC1D253●● <sup>(5)</sup> or LC1D323●● <sup>(5)</sup>	0.335 0.325 0.325

### Power connections by EverLink® BTR screw connectors <sup>(6)</sup> and control by spring terminals

60	3	1 1	LC1D40A3●●	0.850
80	3	1 1	LC1D50A3●● <sup>(7)</sup> or LC1D65A3●● <sup>(7)</sup> or LC1D80A3●● <sup>(7)</sup>	0.855 0.860 0.860

### 3-pole contactors for connection by Faston connectors

These contactors are fitted with Faston connectors: 2 x 6.35 mm on the power poles and 1 x 6.35 mm on the coil terminals. For contactors LC1D09 and LC1D12 only, in the references selected from the previous page, insert a figure **9** before the voltage code. Example: **LC1D09●●** becomes **LC1D099●●**.

### Separate components

Auxiliary contact blocks and add-on modules: see pages B8/22 to B8/28.

### Standard control circuit voltages

(for other voltages, please consult your Regional Sales Office)

#### a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
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#### LC1D09...D80A

50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	S7
----------	----	----	----	----	-----	----	----	----	----	----	----	----	----

#### d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
-------	----	----	----	----	----	----	-----	-----	-----	-----	-----

**LC1D09...D32** (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)

U 0.7...1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
-----------------	----	----	----	----	----	----	----	----	----	----	----

**LC1D40A...D65A** (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)

U 0.75...1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
------------------	----	----	----	----	----	----	----	----	----	----	----

#### Low consumption

Volts	5	12	20	24	48	110	220	250
-------	---	----	----	----	----	-----	-----	-----

**LC1D09...D32** (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)

U 0.8...1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL
-----------------	----	----	----	----	----	----	----	----

For other voltages between 5 and 690 V, see pages B8/31 to B8/34.

(1) **LC1D09** to **D80A**: clip-on mounting on 35 mm rail NSYSDR or screw fixing.

(2) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from **LC1D09** to **D38** and 0.075 kg from **LC1D40A** to **D80A**.

(3) 20 A with 2 x 2.5 mm<sup>2</sup> cables connected in parallel.

(4) 32 A with 2 x 4 mm<sup>2</sup> cables connected in parallel.

(5) 40 A with 2 x 4 mm<sup>2</sup> cables connected in parallel.

(6) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).

(7) Coordination tables according to the number of operating cycles, see AC-1 curve, page A6/40.





# TeSys

## TeSys D Contactors

### Product references



LC1DT20●●



LC1DT80A●●



LC1D65008●●

#### 4-pole contactors - Load control, 20 to 200 A in category AC-1

Non inductive loads maximum current ( $\theta \leq 60^\circ\text{C}$ ) utilisation category AC-1	Number of poles	Instantaneous auxiliary contacts	Basic reference, to be completed by adding the control voltage code Fixing <sup>(1)</sup>	Weight <sup>(2)</sup>

A kg

#### Connection by screw clamp terminals

20	4	—	1	1	LC1DT20●●	0.365
	2	2	1	1	LC1D098●●	0.365
25	4	—	1	1	LC1DT25●●	0.365
	2	2	1	1	LC1D128●●	0.365
32	4	—	1	1	LC1DT32●●	0.425
	2	2	1	1	LC1D188●●	0.425
40	4	—	1	1	LC1DT40●●	0.425
	2	2	1	1	LC1D258●●	0.425

#### Connection by EverLink®, BTR screw connectors

60	4	—	1	1	LC1DT60A●●	1.090
80	4	—	1	1	LC1DT80A●●	1.150

#### Connection by screw clamp terminals or connectors

60	2	2	—	—	LC1D40008●● or LP1D40008●●	1.440 2.210
80	2	2	—	—	LC1D65008●● or LP1D65008●●	1.450 2.220
125	4	—	—	—	LC1D80004●● or LP1D80004●●	1.760 2.685
	2	2	—	—	LC1D80008●● or LP1D80008●●	1.840 2.910
200	4	—	—	—	LC1D115004●●	2.860

#### 4-pole contactors for connection by lugs or bars

In the references selected above, insert a figure 6 before the voltage code.

Example: LC1DT20●● becomes LC1DT206●●.

#### Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

##### a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
LC1D09...D150 and LC1DT20...DT80A (LC1D115 and D150 coils with built-in suppression device as standard)													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	—
LC1D80...D115													
50 Hz	B5	D5	E5	F5	FE5	M5	P5	U5	Q5	V5	N5	R5	S5
60 Hz	B6	—	E6	F6	—	M6	—	U6	Q6	—	—	R6	—

##### d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC1D09...D25 and LC1DT20...DT40 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.75...1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
LC1DT60A ...DT80A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.75...1.25 Uc	JD	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	RD
LP1D40...D80											
U 0.85...1.1 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
U 0.75...1.2 Uc	JW	BW	CW	EW	—	SW	FW	—	MW	—	—
LC1D115 (coil with built-in suppression device as standard)											
U 0.75...1.2 Uc	—	BD	—	ED	ND	SD	FD	GD	MD	UD	RD

##### Low consumption

Volts	5	12	20	24	48	110	220	250
LC1D09...D25 and LC1DT20...DT40 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)								
U 0.8...1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL

For other voltages between 5 and 690 V, see pages B8/31 to B8/34.

(1) LC1D09 to D38 and LC1DT20 to DT80A: clip-on mounting on 35 mm rail NSYSR or screw fixing.

LC1D80 ~: clip-on mounting on 35 mm rail NSYSR or 75 mm rail AM1DL or screw fixing.

LC1 or LP1D80 ~: clip-on mounting on 75 mm rail AM1DL or screw fixing.

LC1D115 and D150: clip-on mounting on 2 x 35 mm rails NSYSR or screw fixing.

(2) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from LC1D09 to D38, 0.075 kg from LC1DT60A and D80A and 1 kg for LC1D80.

(3) For these coil voltages, choose from TeSys D Green contactors. Same product ref. radical, just add BBE coil voltage code for 24 V DC, BNE for 24-60 V AC/DC, EHE for 48-130 V AC/DC, KUE for 100-250 V AC/DC. Example: LC1DT60ABBE.





LC1DT253●●



LC1DT80A3●●

#### 4-pole contactors - Load control, 20 to 80 A in category AC-1

Non inductive loads maximum current ( $\theta \leq 60^\circ\text{C}$ ) utilisation category AC-1	Number of poles	Instantaneous auxiliary contacts	Basic reference, to be completed by adding the voltage code	Weight <sup>(2)</sup>
			Fixing <sup>(1)</sup>	

A					kg
<b>Connection by spring terminals</b>					
20	4	—	1	1	LC1DT203●● 0.380
	2	2	1	1	LC1D0983●● 0.380
25	4	—	1	1	LC1DT253●● 0.380
	2	2	1	1	LC1D1283●● 0.380
32	4	—	1	1	LC1DT323●● 0.425
	2	2	1	1	LC1D1883●● 0.425
40	4	—	1	1	LC1DT403●● 0.425
	2	2	1	1	LC1D2583●● 0.425

#### Connection by EverLink®, BTR screw connectors and control circuit by spring terminals

60	4	—	1	1	LC1DT60A3●● 1.090
80	4	—	1	1	LC1DT80A3●● 1.150

#### Separate components

Auxiliary contact blocks and add-on modules: see pages B8/22 to B8/28.

#### Standard control circuit voltages

(for other voltages, please consult your Regional Sales Office)

##### a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
-------	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

LC1D09...D25 and LC1DT20...DT80A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)

50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	—
----------	----	----	----	----	-----	----	----	----	----	----	----	----	---

##### d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
-------	----	----	----	----	----	----	-----	-----	-----	-----	-----

LC1D09...D25 and LC1DT20...DT40 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)

U 0.7...1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
-----------------	----	----	----	----	----	----	----	----	----	----	----

LC1DT60A...80A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)

U 0.75...1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
------------------	----	----	----	----	----	----	----	----	----	----	----

##### Low consumption

Volts	5	12	20	24	48	110	220	250
-------	---	----	----	----	----	-----	-----	-----

LC1D09...D25 and LC1DT20...DT40 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)

U 0.8...1.25 Uc	AL	JL	ZL	BL	EL	FL	ML	UL
-----------------	----	----	----	----	----	----	----	----

For other voltages between 5 and 690 V, see pages B8/31 to B8/34.

(1) LC1D09 to D38 and LC1DT20 to DT80A: clip-on mounting on 35 mm rail NSYS DR or screw fixing.

(2) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.160 kg from LC1D09 to D38, 0.075 kg for LC1DT60A and DT80A.







LC1D09●●



LC1D25●●



LC1D80A●●



LC1D95●●

## Contactors conforming to UL and CSA standards (North American market) - 25 to 160 A

Standard power ratings of motors 50/60 Hz						Associated cable type 75 °C-Cu	UL continuous current	Type of contactor required Basic reference, to be completed
Single-phase 1 Ø	3-phase 3 Ø	120 V	240 V	208 V	240 V	480 V	600 V	
HP	HP	HP	HP	HP	HP	HP	HP	Fixing, connection <sup>(1)</sup>

### Connection by screw clamp terminals

1/3	1	2	2	5	7.5	AWG 18 - 10	25	LC1D09●●
0.5	2	3	3	7.5	10	AWG 18 - 10	25	LC1D12●●
1	3	5	5	10	15	AWG 18 - 8	32	LC1D18●●
2	3	7.5	7.5	15	20	AWG 14 - 6	40	LC1D25●●
2	5	10	10	20	25	AWG 14 - 6	50	LC1D32●● <sup>(2)</sup>
2	5	10	10	20	25	AWG 14 - 6	50	LC1D38●● <sup>(2)</sup>

### Power connections by EverLink® BTR screw connectors and control by spring terminals

3	5	10	10	30	30	AWG 16 - 2	60	LC1D40A●●
3	7.5	15	15	40	40	AWG 16 - 2	70	LC1D50A●●
5	10	20	20	40	50	AWG 16 - 2	80	LC1D65A●●
5	10	20	20	40	50	AWG 16 - 2	80	LC1D80A●●

### Connection by screw clamp terminals or connectors

7.5	15	25	30	60	60	AWG 10 - 2	110	LC1D80●●
7.5	15	25	30	60	60	AWG 10 - 2	110	LC1D95●●
—	—	30	40	75	100	AWG 8-1/0	160	LC1D115●●
—	—	40	50	100	125	AWG 8-1/0	160	LC1D150●●

## Applications with High-Fault Short-Circuit ratings

High-fault short-circuit current ratings are: 100 kA (D09-80, D115-150) at 600 V with Class J fuses and 85 kA (D09-38), 100 kA (D40A-80, D115-150) at 480 V and 50 kA (D09-80, D115-150) at 600 V with circuit breakers.

### Application example

For a 15 HP-230 V motor

Select a contactor type **LC1D50A**.

Information: the contactor rating selected corresponds to "size 2", the associated cable is type AWG3 75 °C-Cu.

## Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

### a.c. supply

Volts	24	42	48	110	115	120	208	220	230	240	380	400	415	440	480	500
LC1D09...D150 (D115 and D150 coils with built-in suppression device as standard)																
50/60 Hz	B7	D7	E7	F7	FE7	G7 <sup>(3)</sup>	LE7 <sup>(3)</sup>	M7	P7	U7	Q7	V7	N7	R7	T7 <sup>(3)</sup>	S7
LC1D09...D65 (not available with "connection for lugs or bars")																
50 Hz	B5	D5	E5						P5							
LC1D80...D115																
50 Hz	B5	D5	E5	F5	FE5	G5	—	M5	P5	U5	Q5	V5	N5	R5	—	S5
60 Hz	B6	—	E6	F6	—	G6	L6	M6	—	U6	Q6	—	—	R6	T6	—

### d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC1D09...D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.7...1.25 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
LC1D40A...D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.75...1.25 Uc	JD	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	RD
LC1D80 and D95											
U 0.85...1.1 Uc	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
U 0.75...1.2 Uc	JW	BW	CW	EW	—	SW	FW	—	MW	—	—
LC1D115 and D150 (coils with built-in suppression device as standard)											
U 0.75...1.2 Uc	—	BD	—	ED	ND	SD	FD	GD	MD	UD	RD

### Low consumption

Volts	5	12	20	24	48	72	110	220	250
LC1D09...D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)									
U 0.8...1.25 Uc	AL	JL	ZL	BL	EL	SL	FL	ML	UL

<sup>(1)</sup> LC1D09 to D65A: clip-on mounting on 35 mm L rail NSYSR or screw fixing.

LC1D80 and LC1D95: clip-on mounting on 35 mm L rail NSYSR or 75 mm L rail AM1DL or screw fixing.

LC1D115 and D150: clip-on mounting on 2 x 35 mm L rails NSYSR or screw fixing.

<sup>(2)</sup> Versions with spring terminals LC1D323 and LC1D383 are not certified UL/CSA.

<sup>(3)</sup> Contactors LC1D40A, 50A, 65A, 80A: for this coil voltage use is only on 60 Hz.

<sup>(4)</sup> For these coil voltages, choose from TeSys D Green contactors. Same product ref. radical, just add BBE coil voltage code for 24 V DC, BNE for 24-60 V AC/DC, EHE for 48-130 V AC/DC, KUE for 100-250 V AC/DC. Example: LC1D40ABBE.



# TeSys

## TeSys D Reversing contactors

### Product references



LC2D12●●



LC2D65A●●



LC2D1156●●

### 3-pole reversing contactors - Motors up to 75 kW / 400 V in category AC-3

Horizontally mounted - Pre-wired power connections.

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 ( $\theta \leq 60^\circ\text{C}$ )							Rated opera- tional current in AC-3 440 V up to	Instan- taneous auxiliary contacts per contactor	Contactors supplied with coil Basic reference, to be completed by adding the control voltage code		Weight ( <sup>2</sup> )
220 V	380 V	415 V	440 V	500 V	660 V	1000 V	A		Fixing ( <sup>1</sup> )		kg
230 V	400 V				690 V						

With mechanical interlock, without electrical interlocking, for connection by screw clamp terminals or connectors

2.2	4	4	4	5.5	5.5	—	9	1	1	LC2D09●● ( <sup>3</sup> )	0.687
3	5.5	5.5	5.5	7.5	7.5	—	12	1	1	LC2D12●● ( <sup>3</sup> )	0.697
4	7.5	9	9	10	10	—	18	1	1	LC2D18●● ( <sup>3</sup> )	0.707
5.5	11	11	11	15	15	—	25	1	1	LC2D25●● ( <sup>3</sup> )	0.787
7.5	15	15	15	18.5	18.5	—	32	1	1	LC2D32●● ( <sup>3</sup> )	0.797
9	18.5	18.5	18.5	18.5	18.5	—	38	1	1	LC2D38●● ( <sup>3</sup> )	0.807
11	18.5	22	22	22	30	—	40	1	1	LC2D40A●●	1.870
15	22	25	30	30	33	—	50	1	1	LC2D50A●●	1.880
18.5	30	37	37	37	37	—	65	1	1	LC2D65A●●	1.890
22	37	45	45	55	45	—	80	1	1	LC2D80●●	3.200
25	45	45	45	55	45	—	95	1	1	LC2D95●●	3.200

With mechanical interlock and electrical interlocking, for connection by screw clamp terminals or connectors

30	55	59	59	75	80	65	115	1	1	LC2D115●●	6.350
40	75	80	80	90	100	75	150	1	1	LC2D150●●	6.400

Connection by lugs or bars

For reversing contactors LC2D09 to LC2D38, LC2D115 and LC2D150, in the references selected above, insert a figure 6 before the voltage code. Example: **LC2D09●●** becomes **LC2D096●●**.

To build a 40 to 65 A reversing contactor, for connection by lugs, order 2 contactors **LC1D●●A6** and mechanical interlock **LAD4CM** (see page B8/29).

### Component parts

**Auxiliary contact blocks and add-on modules:** see pages B8/22 to B8/28.

(<sup>1</sup>) LC2D09 to D65A: clip-on mounting on 35 mm rail **NSYS DR** or screw fixing.

LC2D80 and D95: clip-on mounting on 35 mm rail **NSYS DR** or 75 mm rail **AM1 DL** or screw fixing.

LC2D115 and D150: clip-on mounting on 35 mm rail **NSYS DR** or screw fixing.

### Standard control circuit voltages (for other voltages, please consult your Regional Sales Office)

#### a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
LC2D09...D150 (D115 and D150 coils with built-in suppression device as standard)													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	S7
LC2D80...D115													
50 Hz	B5	D5	E5	F5	FE5	M5	P5	U5	Q5	V5	N5	R5	S5
60 Hz	B6	—	E6	F6	—	M6	—	U6	Q6	—	—	R6	—

#### d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC2D09...D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.7...1.25 U <sub>c</sub>	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
LC2D40A...D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.75...1.25 U <sub>c</sub>	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD

#### Low consumption

Volts	5	12	20	24	48	110	220	250
LC2D09...D38 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)								
U 0.8...1.25 U <sub>c</sub>	AL	JL	ZL	BL	EL	FL	ML	UL

For other voltages between 5 and 690 V, see pages B8/31 to B8/34.

(<sup>2</sup>) The weights indicated are for contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.330 kg for **LC2D09** to **D38**, 0.150 kg for **LC1D40A** to **D65A**.

(<sup>3</sup>) For reversing contactors with electrical interlocking pre-wired at the factory, add suffix **V** to the references selected above. Example: **LC2D09P7** becomes **LC2D09P7V**.

**Note:** when assembling a reversing contactor, it is good practice to incorporate a 50 ms time delay.





# TeSys

## TeSys D Reversing contactors

### Product references



LC2D123●●

### 3-pole reversing contactors - Motors up to 15 kW / 400 V in category AC-3

#### Pre-wired power connections.

Mechanical interlock without electrical interlocking.

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 ( $\theta \leq 60^\circ\text{C}$ )							Rated operational current in AC-3 440 V up to	Instantaneous auxiliary contacts per contactor	Contactors supplied with coil Basic reference, to be completed by adding the voltage code	Weight <sup>(2)</sup>
220 V 380 V 415 V 440 V 500 V 660 V 230 V 400 V									Fixing <sup>(1)</sup>	
kW	kW	kW	kW	kW	kW	A				kg
For connection by spring terminals										
2.2	4	4	4	5.5	5.5	9	1	1	LC2D093●●	0.687
3	5.5	5.5	5.5	7.5	7.5	12	1	1	LC2D123●●	0.697
4	7.5	9	9	10	10	18	1	1	LC2D183●●	0.707
5.5	11	11	11	15	15	25	1	1	LC2D253●●	0.787
7.5	15	15	15	18.5	18.5	32 <sup>(3)</sup>	1	1	LC2D323●●	0.797
Power connection by EverLink <sup>®</sup> , BTR screw connectors <sup>(4)</sup> and control by spring terminals										
11	18.5	22	22	22	30	40	1	1	LC2D40A3●●	1.870
15	22	25	30	30	33	50	1	1	LC2D50A3●●	1.880
18.5	30	37	37	37	37	65	1	1	LC2D65A3●●	1.890

#### For connection by Faston connectors

#### All power connections are to be made by the customer.

These contactors are fitted with Faston connectors: 2 x 6.35 mm on the power poles and 1 x 6.35 mm on the coil terminals.

For reversing contactors LC2D09 and LC2D12 only, in the references selected above, replace the figure 3 before the voltage code with a figure 9.

Example: LC2D093●● becomes LC2D099●●.

### Component parts

Auxiliary contact blocks and add-on modules: see pages B8/22 to B8/28.

<sup>(1)</sup> LC2D09 to D32: clip-on mounting on 35 mm  $\perp$  rail NSYSR or screw fixing.

### Standard control voltages (for other voltages, please consult your Regional Sales Office)

#### a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
LC2D09...D65A													
50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	S7

#### d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
LC2D09...D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)											
U 0.7...1.25 U <sub>c</sub>	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD

LC2D40A...D65A (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)

U 0.75...1.25 U <sub>c</sub>	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
------------------------------	----	----	----	----	----	----	----	----	----	----	----

#### Low consumption

Volts $\overline{\text{---}}$	5	12	20	24	48	110	220	250
LC2D09...D32 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)								
U 0.8...1.25 U <sub>c</sub>	AL	JL	ZL	BL	EL	FL	ML	UL

For other voltages between 5 and 690 V, see pages B8/31 to B8/34.

<sup>(2)</sup> The weights indicated are for reversing contactors with a.c. control circuit. For d.c. or low consumption control circuit, add 0.330 kg for LC2D09 to D38, 0.150 kg for LC1D40A to D65A.

<sup>(3)</sup> Must be wired with 2 x 4 mm<sup>2</sup> cables in parallel on the upstream side. On the downstream side, outgoing terminal block LAD331 may be used (Quickfit technology, see page B1/18). When wired with a single cable, the product is limited to 25 A (11 kW/400 V motors).

<sup>(4)</sup> BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/28).



# TeSys

## TeSys D Green Reversing contactors

### Product references



LC2D09...



LC2D40A...

TeSys D Green contactors have a dark grey casing and a 3-character code voltage.

### 3-pole reversing contactors - Motors up to 37 kW / 400 V in category AC-3

#### Pre-wired power connections

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 ( $\theta \leq 60^\circ\text{C}$ )						Rated operational current in AC-3 440 V up to	Instantaneous auxiliary contacts per contactor	Contactors supplied with coil Partial reference, to be completed by adding the control voltage code	Weight
220 V	380 V	415 V	440 V	500 V	660 V	A		Fixing <sup>(1)</sup>	kg
230 V	400 V				690 V				

kW	kW	kW	kW	kW	kW	A				kg
With mechanical interlock, without electrical interlocking, for connection by screw clamp terminals or Everlink BTR screw connectors <sup>(2) (3)</sup>										
2.2	4	4	4	5.5	5.5	9	1	1	LC2D09...	0.783
3	5.5	5.5	5.5	7.5	7.5	12	1	1	LC2D12...	0.793
4	7.5	9	9	10	10	18	1	1	LC2D18...	0.803
5.5	11	11	11	15	15	25	1	1	LC2D25...	0.913
7.5	15	15	15	18.5	18.5	32	1	1	LC2D32...	0.923
9	18.5	18.5	18.5	18.5	18.5	38	1	1	LC2D38...	0.933
11	18.5	22	22	22	30	40	1	1	LC2D40A... <sup>(2)</sup>	2.154
15	22	25	30	30	33	50	1	1	LC2D50A... <sup>(2)</sup>	2.164
18.5	30	37	37	37	37	65	1	1	LC2D65A... <sup>(2)</sup>	2.174
22	37	37	37	37	37	66	1	1	LC2D80A... <sup>(2)</sup>	2.174

#### Auxiliary contact blocks and add-on modules

See pages B8/22 to B8/28.

#### Coil voltage codes

##### AC/DC 24 V DC supply

Volts	24 (DC only)	24-60	48-130	100-250
LC2D09...D32, LC2D40A... D80A				
U 0.85...1.1 U <sub>c</sub>		BNE	EHE	KUE
LC2D09...D38				
U 0.8...1.2 U <sub>c</sub>	BNE			
LC2D40A...D80A				
U 0.8...1.2 U <sub>c</sub>	BBE			

<sup>(1)</sup> LC2D09 to D80A: clip-on mounting on 35 mm rail NSYSDR or screw fixing.

<sup>(2)</sup> BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference LADALLEN4, see page B8/28).

<sup>(3)</sup> Electrical interlocking is recommended when 2 orders (direct and reverse) could appeared in the same time.



# TeSys

## TeSys D Changeover contactors

### Product references



LC2DT20●●



LC2D115004●●



Contactors

#### 4-pole changeover contactor pairs - 20 to 200 A in category A-1

##### Pre-assembled. Pre-wired power connections

LC2DT20 to LC2DT40: mechanical interlock without electrical interlocking.

LC2D80004: order separately 2 auxiliary contact blocks LADN●1 to obtain electrical interlocking between the 2 contactors (see page B8/22).

For electrical interlocking incorporated in the mechanical interlock, please consult your Regional Sales Office.

LC2D115004: mechanical interlock with integral, pre-wired electrical interlocking.

##### For connection by screw clamp terminals or connectors

Utilisation category AC-1 Non-inductive loads Maximum rated operational current ( $\theta \leq 60^\circ\text{C}$ )	Instantaneous auxiliary contacts per contactor		Contactors supplied with coil Basic reference, to be completed by adding the voltage code <sup>(1)</sup> Fixing <sup>(2)</sup>	Weight
A				kg
20	1	1	LC2DT20●●	0.730
25	1	1	LC2DT25●●	0.730
32	1	1	LC2DT32●●	0.850
40	1	1	LC2DT40●●	0.850
125	–	–	LC2D80004●●	3.200
200	–	–	LC2D115004●●	7.400

##### For connection by lugs or bars

20	1	1	LC2DT206●●	0.730
25	1	1	LC2DT256●●	0.730
32	1	1	LC2DT326●●	0.850
40	1	1	LC2DT406●●	0.850

##### For customer assembly

##### For connection by screw clamp terminals or connectors

60	1	1	LC1DT60A●● <sup>(3)</sup>	–
80	1	1	LC1DT80A●● <sup>(3)</sup>	–

##### For connection by lugs or bars

60	1	1	LC1DT60A6●● <sup>(3)</sup>	–
80	1	1	LC1DT80A6●● <sup>(3)</sup>	–

**Auxiliary contact blocks and add-on modules:** see pages B8/22 to B8/28.

**Note:** when assembling changeover contactor pairs, it is good practice to incorporate a 50 ms time delay.

<sup>(1)</sup> See note <sup>(1)</sup> on next page.

<sup>(2)</sup> LC2DT20 to LC2DT80: clip-on mounting on 35 mm rail **NSYS DR** or screw fixing.

LC2D80: clip-on mounting on 35 mm rail **NSYS DR** or 75 mm rail **AM1 DL** or screw fixing.

LC2D115: clip-on mounting on 2 x 35 mm rails **NSYS DR** or screw fixing.

<sup>(3)</sup> For these operational currents, order 2 identical contactors and a mechanical interlock **LAD4 CM** (see page B8/29).







Example of necessary components for customer assembly:  
2 x LC1DT80A3 contactors + LAD4CM mechanical interlock

## 4-pole changeover contactor pairs for 20 to 80 A control in category AC-1

### Pre-assembled, for customer assembly

#### Pre-wired power connections, for connection by spring terminals.

Utilisation category AC-1 Non-inductive loads Maximum rated operational current ( $\theta \leq 60^\circ\text{C}$ )	Instantaneous auxiliary contacts per contactor	Contactors supplied with coil Basic reference, to be completed by adding the control voltage code Fixing <sup>(1)</sup>
<b>A</b>		
20	1 1	LC2DT203●●

#### Power connection by EverLink®, BTR screw connectors <sup>(2)</sup> and control by spring terminals

60	1 1	LC1DT60A3●● <sup>(3)</sup>
80	1 1	LC1DT80A3●● <sup>(3)</sup>

### Separate components

Auxiliary contact blocks and add-on modules: see pages B8/19 to B8/19.

#### Standard control circuit voltages

(for other voltages, please consult your Regional Sales Office)

##### a.c. supply

Volts	24	42	48	110	115	220	230	240	380	400	415	440	500
-------	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

##### LC2DT20...DT40, LC2DT60A...DT80A

50/60 Hz	B7	D7	E7	F7	FE7	M7	P7	U7	Q7	V7	N7	R7	—
----------	----	----	----	----	-----	----	----	----	----	----	----	----	---

##### LC2D80004...D115004

50 Hz	B5	D5	E5	F5	FE5	M5	P5	U5	Q5	V5	N5	R5	S5
-------	----	----	----	----	-----	----	----	----	----	----	----	----	----

60 Hz	B6	—	E6	F6	—	M6	—	U6	Q6	—	—	R6	—
-------	----	---	----	----	---	----	---	----	----	---	---	----	---

##### d.c. supply

Volts	12	24	36	48	60	72	110	125	220	250	440
-------	----	----	----	----	----	----	-----	-----	-----	-----	-----

LC2DT20...DT40, LC1DT60...DT80 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)

U 0.7...1.25 U <sub>c</sub>	JD	BD	CD	ED	ND	SD	FD	GD	MD	UD	RD
-----------------------------	----	----	----	----	----	----	----	----	----	----	----

##### Low consumption

Volts	5	12	20	24	48	110	220	250
-------	---	----	----	----	----	-----	-----	-----

LC2DT20...DT40 (coils with integral suppression device fitted as standard, by bi-directional peak limiting diode)

U 0.8...1.25 U <sub>c</sub>	AL	JL	ZL	BL	EL	FL	ML	UL
-----------------------------	----	----	----	----	----	----	----	----

For other voltages between 5 and 690 V, see pages B8/19 to B8/19.

<sup>(1)</sup> Clip-on mounting on 35 mm rail **NSYSDR** or screw fixing.

<sup>(2)</sup> BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/19).

<sup>(3)</sup> For these operational currents, order 2 identical contactors and a mechanical interlock **LAD4CM** (see page B8/19).





LC1DFK●●



LC1DGK●●, LC1DLK●●, LC1DMK●●



LC1DPK●●, LC1DTK●●



LC1DWK12●●

Dimensions, schemes:  
page B8/85

## Contactors for switching 3-phase capacitor banks (power factor correction)

Special contactors **LC1D●K** are designed for switching 3-phase, single or multiple-step capacitor banks (up to 6 steps). Over 6 steps, it is recommended to use chokes in order to limit the inrush current and thus improve the lifetime of the installation. The contactors conform to standards IEC 60070 and 60831, UL and CSA.

## Contactor applications

### Specification

Contactors fitted with a block of early make poles and damping resistors, limiting the value of the current on closing to 60 In max.

This current limitation increases the life of all the components of the installation, in particular that of the fuses and capacitors.

### Operating conditions

Short-circuit protection must be provided by gl type fuses rated at 1.7...2 In.

It will ensure the service continuity of the whole installation in case of a capacitor contactor end of life

### Maximum operational power

The power values given in the selection table below are for the following operating conditions:

Prospective peak current at switch-on	LC1D●K	200 In
Maximum operating rate	LC1DFK, DGK, DLK, DMK	240 operating cycles/hour
	LC1DPK, DTK, DWK	100 operating cycles/hour
Electrical durability at nominal load	All contactor ratings	400 V 300 000 operating cycles
		690 V 200 000 operating cycles

Operational power at 50/60 Hz <sup>(1)</sup> $\theta \leq 60^\circ\text{C}$ <sup>(2)</sup>				Instantaneous auxiliary contacts		Tightening torque on cable end	Basic reference, to be completed by adding the voltage code <sup>(3)</sup>	Weight
230 V	400 V	440 V	690 V	N/O	N/C	N.m		kg
kVAR	kVAR	kVAR	kVAR					
7	12.5	12.5	21	1	2	1.7	LC1DFK●●	0.430
9.5	16.7	16.7	28.5	1	2	2.5	LC1DGK●●	0.450
11	20	21	33	1	2	2.5	LC1DLK●●	0.600
14	25	27	42	1	2	2.5	LC1DMK●●	0.630
17	30	32	50	1	2	5	LC1DPK●●	1.300
22	40	43	67	1	2	5	LC1DTK●●	1.300
35	63	67	104	1	2	9	LC1DWK12●●	1.650

### Switching of multiple-step capacitor banks (with equal or different power ratings)

The correct contactor for each step is selected from the above table, according to the power rating of the step to be switched.

**Example:** 50 kVAR 3-step capacitor bank. Temperature: 50 °C and U = 400 V or 440 V.

One 25 kVAR step: contactor LC1DMK, one 15 kVAR step: contactor LC1DGK, and one 10 kVAR step: contactor LC1DFK.

<sup>(1)</sup> Operational power of the contactor according to the scheme on the page opposite.

<sup>(2)</sup> The average temperature over a 24-hour period, in accordance with standards IEC 60070 and 60831 is 45 °C.

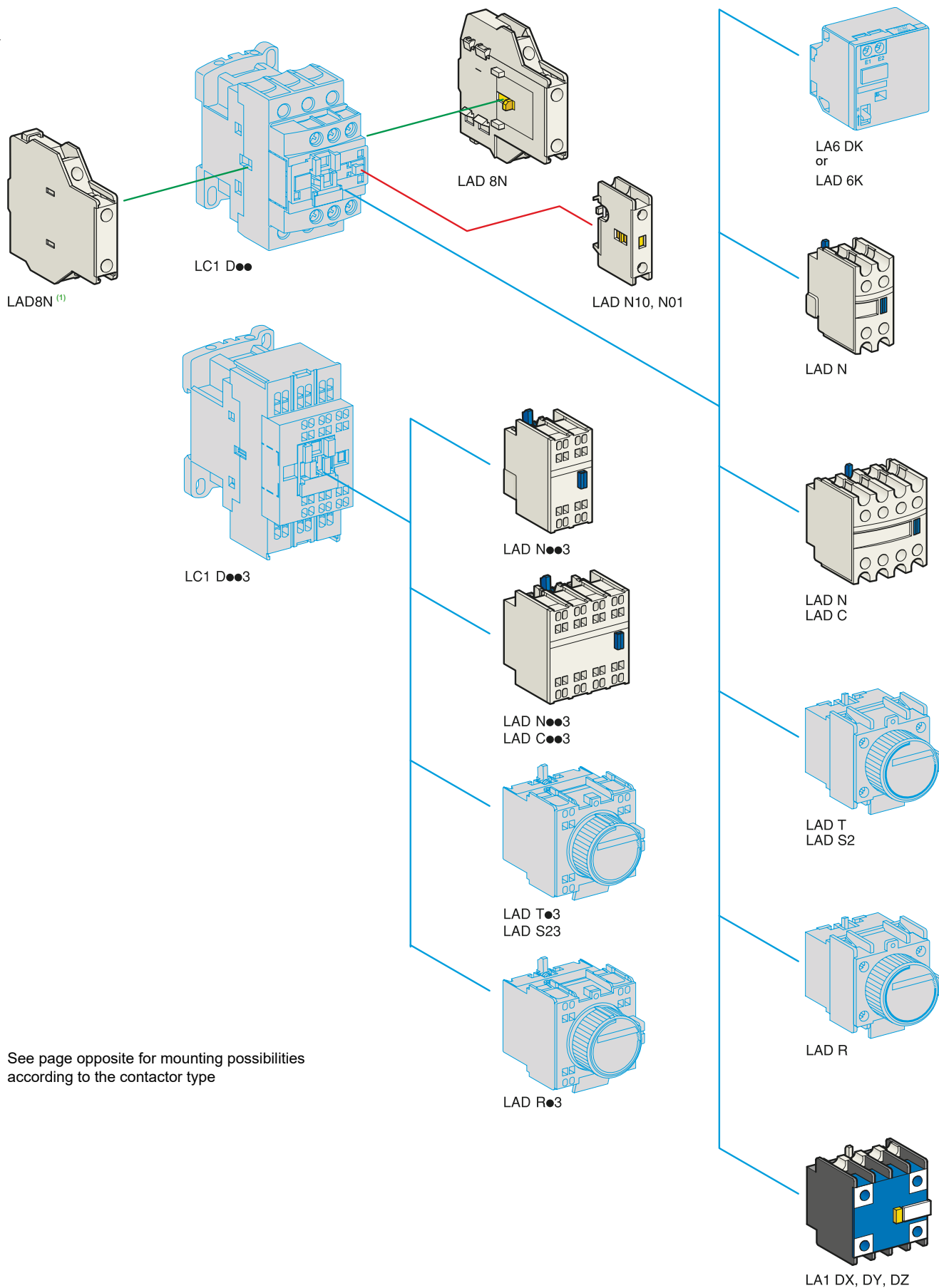
<sup>(3)</sup> Standard control circuit voltages (the delivery time is variable, please consult your Regional Sales Office):

Volts	24	48	110	120	220	230	240	380	400	415	440
50/60 Hz	B7	E7	F7	G7	M7	P7	U7	Q7	V7	N7	R7



Click [HERE](#) for access to online contactor selector





(1) No left side mounting on TeSys D Green contactors.



# TeSys

## TeSys D contactors - Auxilliary contact blocks

### Product references



LADN11








LAD8N11



LA1DX20, LA1DZ40

#### Instantaneous auxiliary contact blocks for connection by screw clamp terminals

For use in normal operating environments

Clip-on mounting	Number of contacts per block	Composition	Reference
		    	
Front	1	— — — 1 —	LADN10
		— — — — 1	LADN01
	2	— — — 1 1	LADN11
		— — — 2 —	LADN20
		— — — — 2	LADN02
	4	— — — 2 2	LADN22 LADN22S <sup>(4)</sup>
		— — — 1 3	LADN13
		— — — 4 —	LADN40
		— — — — 4	LADN04
		— — — 3 1	LADN31
	4 incl. 1 N/O & 1 N/C make before break	— — — 2 2	LADC22
Side	2	— — — 1 1	LAD8N11
(contact blocks compatible with AC coil contactors only)		— — — 2 —	LAD8N20
		— — — — 2	LAD8N02

#### For terminal referencing conforming to EN 50012

Front on 3P contactors and 4P contactors 20 to 80 A	2	— — — 1 1	LADN11G
Front on 4P contactors 125 to 200 A	4	— — — 2 2	LADN22G
	2	— — — 1 1	LADN11P
	4	— — — 2 2	LADN22P

#### With dust and damp protected contacts, for use in particularly harsh industrial environments

Front	2	— 2 — — —	LA1DX20
		1 1 — — —	LA1DX11
		2 — — — —	LA1DX02
		— 2 2 — —	LA1DY20 <sup>(2)</sup>
	4	— 2 — 2 —	LA1DZ40
		— 2 — 1 1	LA1DZ31

#### Instantaneous auxiliary contact blocks for connection by lugs

This type of connection is not possible for blocks with 1 contact or blocks with dust and damp protected contacts. For all other instantaneous auxiliary contact blocks, add the figure 6 to the end of the references selected above. Example: LADN11 becomes LADN116.

#### Instantaneous auxiliary contact blocks for connection by spring terminals

This type of connection is not possible for LAD8, LADN with 1 contact or blocks with dust and damp protected contacts. For all other contact blocks, add the figure 3 to the end of the references selected above. Example: LADN11 becomes LADN113.

#### Instantaneous auxiliary contact blocks for connection by Faston connectors

This type of connection is not possible for LAD8, LADN with 1 contact or blocks with dust and damp protected contacts. For all other contact blocks, add the figure 9 to the end of the references selected above. Example: LADN11 becomes LADN119.

Maximum number of auxiliary contacts that can be fitted:

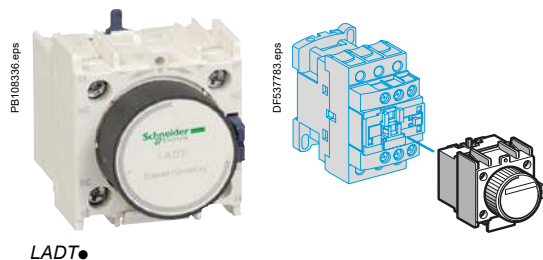
Contactors		Instantaneous auxiliary contacts				Time delay
Type	Number of poles and size	Side mounted	Front mounted			Front mounted
			1 contact	2 contacts	4 contacts	
AC	3P	LC1D09...D38	1 on LH or 1 on RH side <sup>(1)</sup> and	—	1	or 1
AC/DC		LC1D40A...D80A	1 on LH or 1 on RH side	and	—	or 1
		LC1D80 and D95 (50/60 Hz)	1 on each side	or	2	or 1
		LC1D80 and D95 (50 or 60 Hz)	1 on each side	and	2	or 1
		LC1D115 and D150	1 on LH side	and	—	or 1
	4P	LC1DT20...DT40	1 on LH side	and	—	or 1
		LC1DT60A and DT80A	1 on LH or 1 on RH side	and	—	or 1
		LC1D40008, D65008 and D80	1 on each side	or	1	or 1
		LC1D115	1 on each side	and	1	or 1
DC	3P	LC1D09...D38	—	—	1	or 1
		LC1D40A...D80A	—	—	1	or 1
		LC1D80 and D95	—	1	or 1	or 1
		LC1D115 and D150	1 on LH side	and	—	or 1
	4P	LC1DT20...DT40	—	—	1	or 1
		LC1DT60A and DT80A	—	—	1	or 1
		LC1D40008, D65008 and D80	—	2	and 1	or 1
		LC1D115	1 on each side	—	and 1	or 1
LC <sup>(3) (5)</sup>	3P	LC1D09...D38	—	—	1	—
	4P	LC1DT20...DT40	—	—	1	—

<sup>(1)</sup> 1 on LH side for AC coils - 1 on RH side for AC/DC coils. <sup>(4)</sup> With red front face - for safety chain indication.

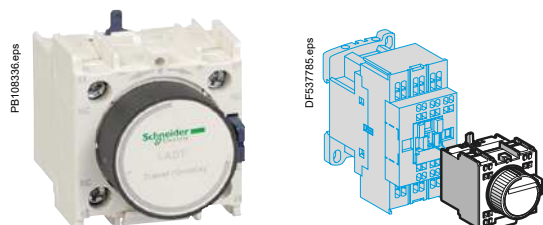
<sup>(2)</sup> Device fitted with 4 earth screen continuity terminals.

<sup>(3)</sup> LC: low consumption. <sup>(5)</sup> LA1D... dust & damp proof auxiliary contact blocks not allowed.

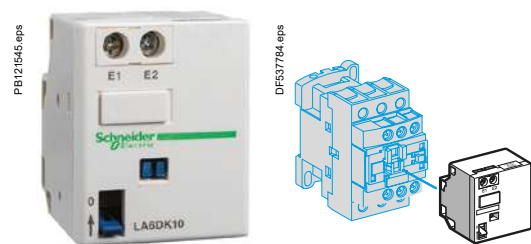




LADT●



LADT●.3



LAD6K10●

### Time delay auxiliary contact blocks for connection by screw clamp terminals

Maximum number of auxiliary contact blocks that can be fitted per contactor, see page B8/22.

Sealing cover to be ordered separately, see page B8/28.

LADT0 and LADR0: with extended scale from 0.1 to 0.6 s.

LADS2: with switching time of 40 ms ± 15 ms between opening of the N/C contact and closing of the N/O contact.

Clip-on mounting	Number of contacts	Time delay		Reference
		Type	Setting range	
Front	1 N/O + 1 N/C	On-delay	0...3 s	LADT0
			1...30 s	LADT2
			10...180 s	LADT4
			1...30 s	LADS2
		Off-delay	0...3 s	LADR0
			1...30 s	LADR2
			10...180 s	LADR4

### Time delay auxiliary contact blocks for connection by lugs

Add the figure 6 to the end of the references selected above. Example: LADT0 becomes LADT06.

### Time delay auxiliary contact blocks for connection by spring terminals

Add the figure 3 to the end of the references selected above. Example: LADT0 becomes LADT03.

### Time delay auxiliary contact blocks for connection by Faston connectors

Add the figure 9 to the end of the references selected above. Example: LADT0 becomes LADT09.

### Mechanical latch blocks <sup>(1)</sup>

Clip-on mounting	Unlatching control	For use on contactor	Basic reference, to be completed by adding the control voltage code <sup>(2)</sup>
Front	Manual or electric	LC1D09...D38 (∼ or ∴) <sup>(3)</sup>	LAD6K10●
		LC1DT20...DT40 (∼ or ∴)	
		LC1D40A...D80A (3 P ∼ or ∴)	LA6DK10●
		LC1DT60A and DT80A (4 P ∼ or ∴)	
		LC1D80...D150 (3 P ∼)	LA6DK20●
		LC1D80 and D115 (3 P ∴)	
		LC1D80 (4 P ∼)	
		LC1D80 and D115 (4 P ∼)	
		LP1D80 and LC1D115 (4 P ∴)	

<sup>(1)</sup> The mechanical latch block must not be powered up at the same time as the contactor. The duration of the control signal for the mechanical latch block and the contactor should be:

≥ 100 ms for a contactor operating on an a.c. supply,

≥ 250 ms for a contactor operating on a d.c. supply.

Maximum impulse duration for the LAD6K10● mechanical latch block: 10 seconds.

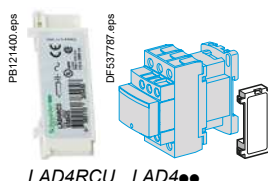
<sup>(2)</sup> Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	50/60 Hz	24	32/36	42/48	60/72	100	110/127	220/240	256/277	380/415
Code		B	C	E	EN	K	F	M	U	Q

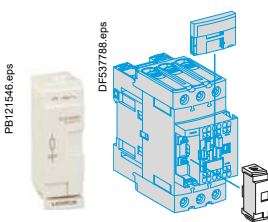
<sup>(3)</sup> The DC, low consumption contactors (coil code ●L) are not compatible with the mechanical latch blocks LAD6K10●.



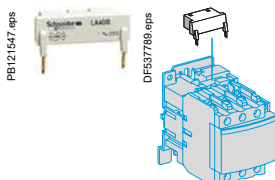




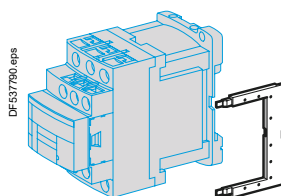
LAD4RCU LAD4●●



LAD4RC3●, LAD4V3●,  
LAD4D3U, LAD4T3●



LA4D●●



LAD4DDL or LAD4T●DL



LAD4DDL

### RC circuits (Resistor-Capacitor)

Effective protection for circuits highly sensitive to "high frequency" interference. For use only in cases where the voltage is virtually sinusoidal, i.e. less than 5 % total harmonic distortion. Voltage limited to 3 Uc max. and oscillating frequency limited to 400 Hz max. Slight increase in drop-out time (1.2 to 2 times the normal time).

Mounting	For use with contactor <sup>(1)</sup> Rating	Type		Reference
		V ~	V ---	
Clip-on side mounting <sup>(3) (5)</sup>	D09...D38 (3P) DT20...DT40	24...48	—	LAD4RCE
		50...127	—	LAD4RCG
		110...250	—	LAD4RCU
Clip-on front mounting <sup>(3) (5)</sup>	D40A...D65A (3P) DT60A...DT80A (4P)	24...48	—	LAD4RC3E
		50...127	—	LAD4RC3G
		110...240	—	LAD4RC3U
		380...415	—	LAD4RC3N
Screw fixing <sup>(4)</sup>	D80...D150 (3P) D40...D115 (4P)	24...48	—	LA4DA2E
		50...127	—	LA4DA2G
		110...240	—	LA4DA2U
		380...415	—	LA4DA2N

### Varistors (peak limiting)

Protection provided by limiting the transient voltage to 2 Uc max. Maximum reduction of transient voltage peaks. Slight increase in drop-out time (1.1 to 1.5 times the normal time).

Clip-on side mounting <sup>(3) (5)</sup>	D09...D38 (3P) DT20...DT40	24...48	—	LAD4VE
		50...127	—	LAD4VG
		110...250	—	LAD4VU
Clip-on front mounting <sup>(3) (5)</sup>	D40A...D65A (3P) DT60A...DT80A (4P)	24...48	24...48	LAD4V3E
		50...127	50...127	LAD4V3G
		110...250	110...250	LAD4V3U
Screw fixing <sup>(4)</sup>	D80...D115 (3P) D80...D115 (4P)	24...48	—	LA4DE2E
		50...127	—	LA4DE2G
		110...250	—	LA4DE2U
	D80...D95 (3P) D80 (4P)	—	24...48	LA4DE3E
		—	50...127	LA4DE3G
		—	110...250	LA4DE3U

### Flywheel diodes

No overvoltage or oscillating frequency. Increase in drop-out time (6 to 10 times the normal time). Polarised component.

Clip-on side mounting <sup>(5)</sup>	D09...D38 (3P), DT20...DT40	—	5...600	LAD4DDL
Clip-on front mounting <sup>(5)</sup>	D40A...D65A (3P), DT60A...DT80A (4P)	—	24...250	LAD4D3U
Screw fixing <sup>(4)</sup>	D80 and D95 (3P), D40...D80 (4P)	—	24...250	LA4DC3U

### Bidirectional peak limiting diodes

Protection provided by limiting the transient voltage to 2 Uc max. Maximum reduction of transient voltage peaks.

Clip-on side mounting <sup>(3)</sup>	D09...D38 (3P) DT20...DT40 (4P) <sup>(2)</sup>	24	—	LAD4TB
		—	24	LAD4TBDL
		72	—	LAD4TS
		—	72	LAD4TSDL
		—	125	LAD4TGD
		—	250	LAD4TUDL
Clip-on front mounting <sup>(3)</sup>	D40A...D65A (3P) DT60A...DT80A (4P) <sup>(2)</sup>	—	600	LAD4TXDL
		12...24	12...24	LAD4T3B
		25...72	25...72	LAD4T3S
		73...125	73...125	LAD4T3G
		126...250	126...250	LAD4T3U
		251...440	251...440	LAD4T3R
Screw fixing <sup>(4)</sup>	D80...D95 (3P) D40...D80 (4P)	12...24	—	LA4DB2B
		25...72	—	LA4DB2S
		—	24	LA4DB3B
		—	72	LA4DB3S
		—	—	—
		—	—	—

<sup>(1)</sup> For satisfactory protection, a suppressor module must be fitted across the coil of each contactor except for TeSys D Green (●●E coil), as surge protection is already embedded.

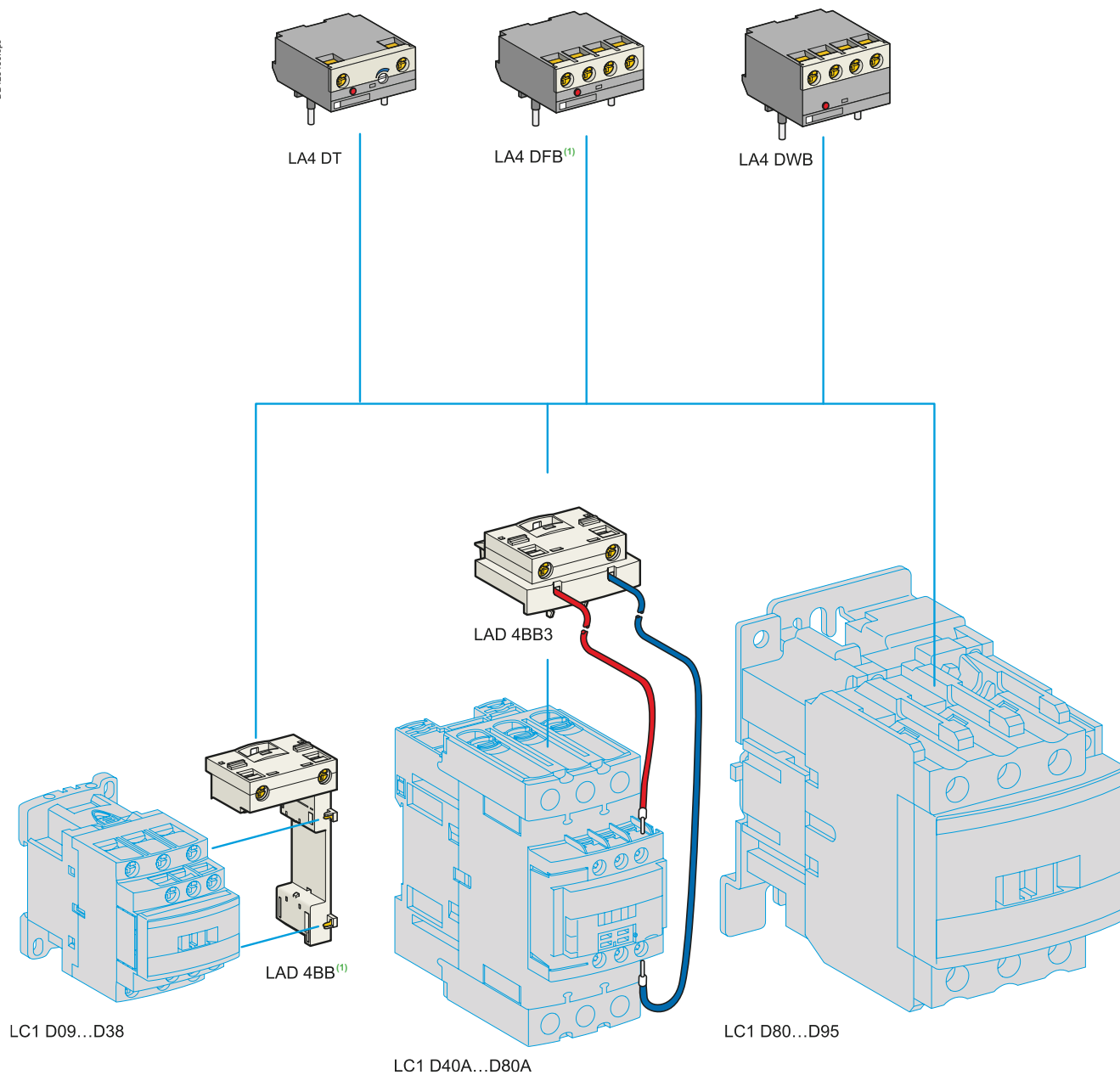
<sup>(2)</sup> From D09 to D65A and from LC1DT20 to DT80A, d.c., low consumption are fitted with a built-in bidirectional peak limiting diode suppressor as standard. This bidirectional peak limiting diode is removable and can therefore be replaced by the user. (See reference above). If a d.c. or low consumption contactor is used without suppression, the standard suppressor should be replaced with a blanking plug (reference LAD9DL for LC1D09 to D38 and LC1DT20 to DT40; reference LAD9DL3 for LC1D40A to D65A and LC1DT60A to DT80A).

<sup>(3)</sup> Clipping-on makes the electrical connection. The overall size of the contactor remains unchanged.

<sup>(4)</sup> Mounting at the top of the contactor on coil terminals A1 and A2.

<sup>(5)</sup> In order to install these accessories, the existing suppression device must first be removed.





See page opposite for mounting possibilities according to the contactor type.

<sup>(1)</sup> For TeSys D with AC coil only.





LA4DT00



LA4DFB



LA4DBL



LAD4BBVU

#### Electronic serial timer modules <sup>(1)</sup>

- 3-pole contactors LC1D09 to D38: mounted using adapter LAD4BB, to be ordered separately, see below.
- 3-pole contactors LC1D40A to D65A: mounted using adapter LAD4BB3, to be ordered separately, see below.
- 3-pole contactors LC1D80 to D150 and 4-pole contactors LC1D40 to D115: mounted directly across terminals A1 and A2 of the contactor.

#### On-delay type

Operational voltage ~		Time delay	Reference
24...250 V	100...250 V		
LC1D09...D80A (3P)	LC1D80...D150 (3P)	0.1...2 s	LA4DT0U
		1.5...30 s	LA4DT2U
		25...500 s	LA4DT4U

#### Interface modules

- 3-pole contactors LC1D09 to D38: mounted using adapter LAD4BB, to be ordered separately, see below.
- 3-pole contactors LC1D40A to D80A: mounted using adapter LAD4BB3, to be ordered separately, see below.

#### Relay interface

Operational voltage ~		Supply voltage E1-E2 (---)	Reference
24...250 V	100...250 V		
LC1D09...D150 (3P)		24 V	LA4DFB

#### Static relay interface

Operational voltage ~		Supply voltage E1-E2 (---)	Reference
24...250 V	100...250 V		
LC1D09...D80A (3P)	LC1D80...D115 (3P)	24 V	LA4DWB

#### Adapter kit for low control signal

For use on contactors	Composition	Reference
LC1D40A...D80A (3P) <sup>(2)</sup>	<ul style="list-style-type: none"> <li>■ 1 LAD4BB3 coil wiring adapter</li> <li>■ 1 LA4DFB relay interface module</li> </ul>	LA4DBL

#### Wiring adapters for coil retrofit of 3 pole contactors

##### For adapting existing wiring to a new product

For use on contactors		Reference	
LC1D09...D38	Without coil suppression		LAD4BB <sup>(3)</sup>
		~ 24...48 V	LAD4BBVE
		~ 50...127 V	LAD4BBVG
	With coil suppression	~ 110...250 V	LAD4BBVU
LC1D40A...80A		Without coil suppression	LAD4BB3

<sup>(1)</sup> For 24 V operation, the contactor must be fitted with a 21 V coil (code Z). See pages B8/31 to B8/34.

<sup>(2)</sup> The kit is compatible with a coil voltage of ~ 24 V to ~ 250 V (B7 to U7) and --- 24 V to --- 250 V (BD to UD).

<sup>(3)</sup> LAD4BB can not be used with 4 poles contactors.



# TeSys

## TeSys D contactors - Accessories

### Product references



LA9D3260



LA9D11550



LAD96570



LA9D11560



LA9D11570



LA9D80962



LA9D11567

#### Accessories for main pole and control connections

Description		For use with contactors LC1		Sold in lots of	Unit reference
		~	---		
Connectors for cable, size (1 connector)	4-pole 10 mm <sup>2</sup>	DT20, DT25	DT20, DT25	1	LA9D2560
	3-pole 25 mm <sup>2</sup>	D09...D38	D09...D38	1	LA9D3260
EverLink® terminal block	3-pole	D40A...D80A	D40A...D80A	1	LAD96560
Connectors for cables (2 connectors)	3-pole 120 mm <sup>2</sup>	D115, D150	D115, D150	1	LA9D115603
	4-pole 120 mm <sup>2</sup>	D115	D115	1	LA9D115604
Connectors for lug type terminals (2 connectors)	3-pole	D1156, D1506	D1156, D1506	1	LA9D115503
	4-pole	D1156	D1156	1	LA9D115504
Protective covers for connectors for lug type terminals	3-pole	D40A6...D80A6	D40A6...D80A6	1	LAD96570
		D1156, D1506	D1156, D1506	1	LA9D115703 <sup>(1)</sup>
	4-pole	D60A6...D80A6	D60A6...D80A6	1	LAD96580
		D1156, D1506	D1156, D1506	1	LA9D115704
IP 20 covers for lug type terminals (for mounting with circuit breakers GV3 P●●6 and GV3 L●●6)	3 poles	D40A6...D80A6	D40A6...D80A6	1	LAD96575
Links for parallel connection of	2 poles	D09...D38	D09...D38	10	LA9D2561
		DT20, DT25 (4P)	DT20, DT25 (4P)	10	LA9D1261
		DT32, DT40 (4P)	DT32, DT40 (4P)	10	LAD96061
		D40A...D80A	D40A...D80A	1	LAD9P32
		D80, D95	D80, D95	2	LA9D80961
	3 poles	D09...D38	D09...D38	10	LAD9P3 <sup>(2)</sup>
		D40A...D80A	D40A...D80A	1	LAD9P33
		D80, D95	D80, D95	1	LA9D80962
	4 poles	DT20, DT25	DT20, DT25	2	LA9D1263
		D80	D80	2	LA9D80963
Staggered coil connection	—		D80	10	LA9D09966
Control circuit take-off from main pole	D80, D95	D80, D95		10	LA9D8067
	D115, D150	D115, D150		10	LA9D11567
Spreaders for increasing the pole pitch to 45 mm	D115, D150	D115, D150		3	GV7AC03

<sup>(1)</sup> For 3-pole contactors: 1 set of 6 covers, for 4-pole contactors: 1 set of 8 covers.

<sup>(2)</sup> Separate connecting bar for connecting 2 poles in parallel.

Contactors



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GV2G245



GV1G09



GV3S



LA9D941



LAD9ET1



LAD9ET1S



LAD21...24



LAD90



LAD7X3

### Sets of contacts and arc chambers

Description	For contactor	Reference
Sets of contacts	3-pole	LC1D115
		LA5D1158031
	4-pole	LC1D150
		LA5D150803
Arc chambers	3-pole	LC1D115004
		LA5D115804
	4-pole	LC1D115
		LA5D11550
		LC1D150
		LA5D15050
		LC1D115004
		LA5D115450

### Power connection accessories

Terminal block	For supply to one or more GV2G busbar sets	GV1G09
Set of 63 A busbars	2 contactors LC1D09...D18 or D25...D38	GV2G245
Set of 115 A busbars for paralleling of contactors	4 contactors LC1D09...D18 or D25...D38	GV2G445
	2 contactors LC1D40A...D80A	GV3G264
	3 contactors LC1D40A...D80A	GV3G364 <sup>(1)</sup>
Set of S-shape busbars	For circuit breakers GV3P... and GV3L... <sup>(3)</sup> and contactors LC1D40A...D73A	GV3S

### Protection accessories

Description	Use	Sold in lots of	Reference
Miniature control circuit fuse holder	5 x 20 with 4 A-250 V fuse	1	LA9D941
Sealing cover	For LADT, LADR	1	LA9D901
Safety cover preventing access to the moving contact carrier	LC1D09...D80A and DT20...DT80A	1	LAD9ET1
	Red cover (for safety chain indication)	1	LAD9ET1S
	LC1D80 and D95	1	LAD9ET3
	Red cover (for safety chain indication)	1	LAD9ET3S
	LC1D115 and D150	1	LAD9ET4
	Red cover (for safety chain indication)	1	LAD9ET4S

### Marking accessories

Description	Use	Sold in lots of	Unit reference
Sheet of 64 blank legends, self-adhesive, 8 x 33 mm <sup>(2)</sup>	Contactors (except 4P) LC1D80...D115, LADN (4 contacts), LA6DK	10	LAD21
Sheet of 112 blank legends, self-adhesive, 8 x 12 mm <sup>(2)</sup>	LADN (2 contacts), LADT, LADR, LRD	10	LAD22
Sheet of 64 blank legends for marking using plotter or 8 x 33 mm engraver	Contactors (except 4P) LC1D80...D115, LAD (4 contacts), LA6DK	10	LAD23
Sheet of 440 blank legends for marking using plotter or 8 x 12 mm engraver	All products	35	LAD24
Marker holder snap-in, 8 x 22 mm	4-pole contactors, LC1D80...D115, LA6DK	100	LA9D92
Marker holder snap-in, 8 x 18 mm	LC1D09...D65A, LC1DT20...DT80A, LADN (4 contacts), LADT, LADR	100	LAD90
Bag of 300 blank legends self-adhesive, 7 x 21 mm	On holder LA9D92	1	LA9D93

### Mounting accessories

Retrofit plate for screw fixing	For replacement of LC1D40 to D80 with LC1D40A to D80A	1	LAD7X3
Mounting plate	For replacement of LC1F115 or F150 with LC1D115 or D150	1	LA9D730
Size 4 Allen key, insulated, 1000 V	For use on contactors LC1D40A to LC1D150	5	LADALLEN4

<sup>(1)</sup> With this set of busbars, any one contactor can be supplied directly by its EverLink® double cage power terminal block. The other two contactors are supplied by the busbar set. The 115 A limitation is therefore applied to these two contactors. Example: 1 LC1D65A supplied directly + 1 contactor LC1D65A and 1 contactor LC1D50A supplied via the busbar set = 115 A. This combination is compatible with busbar set GV3G364.

<sup>(2)</sup> These legends are for sticking onto the safety cover of the contactors or add-on block, if fitted.

<sup>(3)</sup> With 73 A current limit for GV3L73, GV3P73.



# TeSys

## TeSys D contactors - Assembly kits

### Product references

PB121375.eps



LAD9R1

PB121376.eps



LAD9R3

PB121377.eps



LA9D8069

PB114205.eps



LAD91217

PB121378.eps



LAD91218

### For 3-pole reversing contactors for motor control

Contactors with screw clamp terminals or connectors. Horizontally mounted, assembled by customer.

Description	For contactors <sup>(1)</sup> (2 identical contactors)	Reference
<b>Kits for assembly of reversing contactors</b>		
Kit comprising: ■ a mechanical interlock <b>LAD9V2</b> with electrical interlocking <b>LAD9V1</b> ■ a set of power connections <b>LAD9V5</b> (parallel) and <b>LAD9V6</b> (reversing).	LC1D09 to D38	<b>LAD9R1V</b>
Kit comprising: ■ a mechanical interlock <b>LAD9V2</b> without electrical interlocking ■ a set of power connections <b>LAD9V5</b> (parallel) and <b>LAD9V6</b> (reversing).	LC1D09 to D38	<b>LAD9R1</b>
Kit comprising: ■ a mechanical interlock <b>LAD4CM</b> ■ a set of power connections <b>LA9D65A69</b> .	LC1D40A to D80A	<b>LAD9R3</b>
<b>Mechanical interlocks</b>		
Mechanical interlock with integral electrical interlocking	LC1D80 and D95 (∼)	<b>LA9D4002</b>
	LC1D80 and D95 (≡)	<b>LA9D8002</b>
	LC1D115 and D150	<b>LA9D11502</b>
Mechanical interlock without integral electrical interlocking	LC1D09 to D38	<b>LAD9V2</b>
	LC1D40A to D80A	<b>LAD4CM</b>
	LC1D80 and D95 (∼)	<b>LA9D50978</b>
	LC1D80 and D95 (≡)	<b>LA9D80978</b>

### Sets of power connections

Comprising: ■ a set of parallel bars ■ a set of reverser bars.	LC1D09 to D38 with screw clamp terminals or connectors	<b>LAD9V5 + LAD9V6</b>
	LC1D09...D32 with spring terminal connections	<b>LAD9V12 + LAD9V13 <sup>(2)</sup></b>
	LC1D40A to D80A	<b>LA9D65A69</b>
	LC1D80 and D95 (∼)	<b>LA9D8069</b>
	LC1D80 and D95 (≡)	<b>LA9D8069</b>
	LC1D115 and D150	<b>LA9D11569</b>

### For low-speed/high-speed starter

Description	For LC1D09... D38 contactors with connection type	Reference
Connection kit enabling reversing of low and high speed directions using a reversing contactor and a 2N/O + 2N/C main pole contactor	Screw clamps or connectors	<b>LAD9PVG</b>
	Spring terminals	<b>LAD3PVG</b>

### For star-delta starter

Description	For contactors	Reference	Without timer LADS2
Mounting kit comprising: ■ 1 time delay contact block <b>LADS2</b> (LC1D09...D80), ■ power circuit connections (LC1D09...D80), ■ hardware required for fixing the contactors onto the mounting plate (LC1D80).	LC1D09 to D38 <sup>(3)</sup>	<b>LAD91217</b>	<b>LAD91218</b>
	LC1D09 to D38 <sup>(4)</sup>	<b>LAD93217</b>	<b>LAD93218</b>
	LC1D40A to D65A	<b>LAD9SD3</b>	—
	LC1D80	<b>LA9D8017</b>	—
Equipment mounting plates	LC1D09 to D38	<b>LA9D12974</b>	
	LC1D40A and D50A	—	
	LC1D80	<b>LA9D80973</b>	

<sup>(1)</sup> To order the 2 contactors: see pages B8/9 and B8/15.

<sup>(2)</sup> To assemble a reversing contactor with spring terminal connections, the following components must be ordered:

- 1 mechanical interlock **LAD9V2**,
- 1 upstream power connection kit and 1 downstream power connection kit.

Upstream power connection kit **LAD9V10**: installed in the Quickfit system with power connection module **LAD34**.

(If module **LAD34** is not used, replace **LAD9V10** with **LAD9V12**).

Downstream power connection kit **LAD9V11**: installed in the Quickfit system with outgoing terminal block **LAD331**.

(If **LAD331** is not used, replace **LAD9V11** with **LAD9V13**).

<sup>(3)</sup> For assembly of 3 contactors of the same physical size (depth).

<sup>(4)</sup> For assembly of 3 contactors with star contactor physically smaller (depth).

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# TeSys

## TeSys D contactors - Assembly kits

### Product references



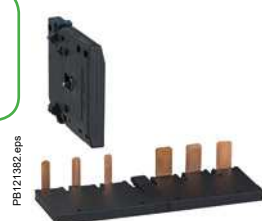
LADT9R1V



LA9D50978



LA9D8070



LAD9R3S

#### For 4-pole changeover contactor pairs (3-phase distribution + neutral)

Contactors with screw clamp terminals or connectors. Horizontally mounted, assembled by customer.

Description	For contactors <sup>(1)</sup> (2 identical contactors)	Reference
-------------	---	-----------

#### Kits for assembly of changeover contactor pairs

Kit comprising: ■ a mechanical interlock LAD9V2 with electrical interlocking LAD9V1, ■ a set of power connections (changeover) LAD9V7.	LC1DT20 to DT40 with screw clamps or connectors	LADT9R1V
--	---	----------

Kit comprising: ■ a mechanical interlock LAD9V2 without electrical interlocking, ■ a set of power connections (changeover) LAD9V7.	LC1DT20 to DT40 with screw clamps or connectors	LADT9R1
--	---	---------

#### Mechanical interlocks

With integral electrical interlocking	LC1D80004	LA9D4002
	LP1D80004	LA9D8002
	LC1D115004	LA9D11502
Without integral electrical interlocking	LC1DT20 to DT40 with screw clamps or connectors	LAD9V2 <sup>(2)</sup>
	LC1DT203 to DT403 with spring terminals	LAD9V2 <sup>(2)</sup>
	LC1DT60A and DT80A	LAD4CM
	LC1D80004	LA9D50978
	LP1D80004	LA9D80978

#### Sets of power connections

Comprising a set of parallel bars	LC1D80004	LA9D8070
	LP1D80004	LA9D8070
	LC1D115004	LA9D11570
	LC1DT203 to DT403 with spring terminals	LAD9V9
	LC1D80004	LA9D8070 <sup>(2)</sup>
	LP1D80004	LA9D8070 <sup>(2)</sup>

#### For 3-pole changeover contactor pairs

Contactors with screw clamp terminals or connectors. Horizontally mounted, assembled by customer.

Description	For contactors <sup>(1)</sup> (2 identical contactors)	Reference
-------------	---	-----------

#### Kits for assembly of changeover contactor pairs

Kit comprising: ■ a mechanical interlock LAD4CM ■ a set of parallel bars LA9D65A6	LC1D40A...D80A	LAD9R3S
---	----------------	---------

#### Mechanical interlocks

Without integral electrical interlocking	LC1D40A...D80A	LAD4CM
With integral electrical interlocking	LC1D115 and D150	LA9D11502

#### Sets of power connections

Comprising a set of parallel bars	LC1D40A...D80A	LA9D65A6
	LC1D115 and D150	LA9D11571

<sup>(1)</sup> To order the 2 contactors: see pages B8/9 and B8/15.

<sup>(2)</sup> Order 2 contact blocks LADN●1 to build the electrical interlock, see page B8/22.

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LXD1●●

## a.c coils for ~ contactors LC1D09...D38 and LC1DT20...DT40

### Specifications

Average consumption at 20 °C:

■ inrush ( $\cos \phi = 0.75$ ) 70 VA,

■ sealed ( $\cos \phi = 0.3$ ) 50 Hz: 7 VA, 60 Hz: 7.5 VA.

Operating range ( $\theta \leq 60$  °C): 50 Hz: 0.8...1.1 Uc, 60 Hz: 0.85...1.1 Uc.

Control circuit voltage Uc	Average resistance at 20 °C $\pm 10$ %	Inductance of closed circuit	Reference <sup>(1)</sup>
V	$\Omega$	H	
			50/60 Hz
12	1.33	0.05	LXD1J7
21 <sup>(2)</sup>	4.17	0.17	LXD1Z7
24	5.37	0.22	LXD1B7
32	10.1	0.39	LXD1C7
36	12.8	0.49	LXD1CC7
42	17	0.67	LXD1D7
48	21.7	0.87	LXD1E7
60	34.6	1.4	LXD1EE7
100	100.4	3.8	LXD1K7
110	124.1	4.6	LXD1F7
115	129.8	5	LXD1FE7
120	150.6	5.4	LXD1G7 <sup>(3)</sup>
127	158.5	6.1	LXD1FC7
200	410.7	15	LXD1L7
208	430.4	16	LXD1LE7 <sup>(3)</sup>
220	515.4	18	LXD1M7 <sup>(4)</sup>
230	538.6	20	LXD1P7
240	562.3	22	LXD1U7
277	800.7	29	LXD1W7 <sup>(3)</sup>
380	1551	55	LXD1Q7 <sup>(5)</sup>
400	1633	60	LXD1V7
415	1694	65	LXD1N7
440	1993	73	LXD1R7
480	2398	87	LXD1T7 <sup>(3)</sup>
500	2499	95	LXD1S7
575	3294	125	LXD1SC7
600	3810	136	LXD1X7
660	4656	165	LXD1YC7
690	5020	180	LXD1Y7

<sup>(1)</sup> The last 2 digits in the reference represent the voltage code.

<sup>(2)</sup> Voltage for special coils fitted in contactors with serial timer modules, with 24 V supply.

<sup>(3)</sup> Coil for use only on 60 Hz.

<sup>(4)</sup> Suitable for use on 230 V / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see page B8/60 and B8/62).

<sup>(5)</sup> Suitable for use on 400 V / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see page B8/60 and B8/62).





## a.c coils for ~ contactors LC1D40A...D80A, LC1DT60A and LC1DT80A

### Specifications

Average consumption at 20 °C:

■ inrush ( $\cos \phi = 0.75$ ) 160 VA,

■ sealed ( $\cos \phi = 0.3$ ) 50 Hz: 15 VA, 60 Hz: 15 VA.

Operating range ( $\theta \leq 60$  °C): 50 Hz: 0.8...1.1 Uc, 60 Hz: 0.85...1.1 Uc.

Control circuit voltage Uc	Average resistance at 20 °C $\pm 10\%$	Inductance of closed circuit	Reference <sup>(1)</sup>
V	$\Omega$	H	
12	0.49	0.03	<b>50/60 Hz</b> <b>LXD3J5</b> <sup>(2)</sup>
24	1.98	0.12	<b>LXD3B7</b>
32	3.76	0.22	<b>LXD3C7</b>
42	6.18	0.37	<b>LXD3D7</b>
48	7.97	0.48	<b>LXD3E7</b>
100	37.63	2.07	<b>LXD3K7</b>
110	42.28	2.50	<b>LXD3F7</b>
115	48.76	2.74	<b>LXD3FE7</b>
120	37.63	2.07	<b>LXD3G7</b> <sup>(5)</sup>
127	60.29	3.34	<b>LXD3FC7</b>
200	149	8.27	<b>LXD3L7</b>
208	105	6.22	<b>LXD3LE7</b> <sup>(5)</sup>
220	182	10	<b>LXD3M7</b> <sup>(3)</sup>
230	192	10.9	<b>LXD3P7</b>
240	202	11.9	<b>LXD3U7</b>
277	193	11	<b>LXD3W7</b> <sup>(5)</sup>
380	512	29.9	<b>LXD3Q7</b> <sup>(4)</sup>
400	607	33.1	<b>LXD3V7</b>
415	635	35.6	<b>LXD3N7</b>
440	682	40.1	<b>LXD3R7</b>
480	607	33.1	<b>LXD3T7</b> <sup>(5)</sup>
500	878	51.7	<b>LXD3S7</b>
575	1238	68.4	<b>LXD3SC7</b>
600	1304	74.5	<b>LXD3X7</b>
660	1593	90.1	<b>LXD3YC7</b>
690	1683	98.5	<b>LXD3Y7</b>

<sup>(1)</sup> The last 2 digits in the reference represent the voltage code.

<sup>(2)</sup> This coil can only be used on 50 Hz.

<sup>(3)</sup> Suitable for use on 230 V / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see page B8/60 and B8/62).

<sup>(4)</sup> Suitable for use on 400 V / 50 Hz. In this case, apply a coefficient of 0.6 to the mechanical durability of the contactor (see page B8/60 and B8/62).

<sup>(5)</sup> This coil can only be used on 60 Hz.



PS121355.eps



LX1D6●●

## a.c coils for 3 or 4-pole contactors LC1D40, D50, D65, D80, D95

### Specifications

Average consumption at 20 °C:

■ inrush ( $\cos \phi = 0.75$ ) 50 Hz: 200 VA, 60 Hz: 220 VA

■ sealed ( $\cos \phi = 0.3$ ) 50 Hz: 20 VA, 60 Hz: 22 VA.

Operating range ( $\theta \leq 55$  °C): 0.85... 1.1 Uc.

Control circuit voltage Uc	Average resistance at 20 °C $\pm 10$ %	Inductance of closed circuit H	Reference (1)	Average resistance at 20 °C $\pm 10$ %	Inductance of closed circuit H	Reference (1)
V	$\Omega$	H		$\Omega$	H	
			<b>50 Hz</b>			<b>60 Hz</b>
24	1.4	0.09	LX1D6B5	1.05	0.06	LX1D6B6
32	2.6	0.16	LX1D6C5	—	—	—
42	4.4	0.27	LX1D6D5	—	—	—
48	5.5	0.35	LX1D6E5	4.2	0.23	LX1D6E6
110	31	1.9	LX1D6F5	22	1.2	LX1D6F6
115	31	1.9	LX1D6FE5	—	—	—
120	—	—	—	28	1.5	LX1D6G6
127	41	2.4	LX1D6G5	—	—	—
208	—	—	—	86	4.3	LX1D6L6
220	—	—	—	98	4.8	LX1D6M6
220/230	127	7.5	LX1D6M5	—	—	—
230	133	8.1	LX1D6P5	—	—	—
240	152	8.7	LX1D6U5	120	5.7	LX1D6U6
256	166	10	LX1D6W5	—	—	—
277	—	—	—	157	8	LX1D6W6
380	—	—	—	300	14	LX1D6Q6
380/400	381	22	LX1D6Q5	—	—	—
400	411	25	LX1D6V5	—	—	—
415	463	26	LX1D6N5	—	—	—
440	513	30	LX1D6R5	392	19	LX1D6R6
480	—	—	—	480	23	LX1D6T6
500	668	38	LX1D6S5	—	—	—
575	—	—	—	675	33	LX1D6S6
600	—	—	—	775	36	LX1D6X6
660	1220	67	LX1D6Y5	—	—	—

### Specifications

Average consumption at 20 °C:

■ inrush ( $\cos \phi = 0.75$ ) 50/60 Hz: 245 VA at 50 Hz

■ sealed ( $\cos \phi = 0.3$ ) 50/60 Hz: 26 VA at 50 Hz.

Operating range ( $\theta \leq 55$  °C): 0.85... 1.1 Uc.

						<b>50/60 Hz</b>
24	—	—	—	1.22	0.08	LX1D6B7
42	—	—	—	3.5	0.25	LX1D6D7
48	—	—	—	5	0.32	LX1D6E7
110	—	—	—	26	1.7	LX1D6F7
115	—	—	—	—	—	LX1D6FE7
120	—	—	—	32	2	LX1D6G7
220/230 (2)	—	—	—	102	6.7	LX1D6M7
230	—	—	—	115	7.7	LX1D6P7
230/240 (3)	—	—	—	131	8.3	LX1D6U7
380/400 (4)	—	—	—	310	20	LX1D6Q7
400	—	—	—	349	23	LX1D6V7
415	—	—	—	390	24	LX1D6N7
440	—	—	—	410	27	LX1D6R7

(1) The last 2 digits in the reference represent the voltage code.

(2) For use on 230 V / 50 Hz, apply a coefficient of 0.6 to the mechanical durability of the contactor, see page B8/60 and B8/62. This coil can be used on 240 V at 60 Hz.

(3) This coil can be used on 220/240 V at 50 Hz and on 240 V only at 60 Hz.

(4) For use on 400 V / 50 Hz, apply a coefficient of 0.6 to the mechanical durability of the contactor, see page B8/60 and B8/62.



PB 121366 eps



LX1D8●●

## a.c coils for 3 or 4-pole contactors LC1D115

### Specifications

Average consumption at 20 °C:

■ inrush ( $\cos \phi = 0.8$ ) 50 or 60 Hz: 300 VA

■ sealed ( $\cos \phi = 0.3$ ) 50 or 60 Hz: 22 VA.

Operating range ( $\theta \leq 55$  °C): 0.85...1.1 Uc.

Control circuit voltage Uc	Average resistance at 20 °C $\pm 10$ %	Inductance of closed circuit	Reference (1)	Average resistance at 20 °C $\pm 10$ %	Inductance of closed circuit	Reference (1)
V	$\Omega$	H		$\Omega$	H	
			50 Hz			
24	1.24	0.09	LX1D8B5	0.87	0.07	LX1D8B6
32	2.14	0.17	LX1D8C5	—	—	—
42	3.91	0.28	LX1D8D5	—	—	—
48	4.51	0.36	LX1D8E5	3.91	0.28	LX1D8E6
110	26.53	2.00	LX1D8F5	19.97	1.45	LX1D8F6
115	26.53	2.00	LX1D8FE5	—	—	—
120	—	—	—	24.02	1.70	LX1D8G6
127	32.75	2.44	LX1D8FC5	—	—	—
208	—	—	—	67.92	5.06	LX1D8L6
220	104.77	7.65	LX1D8M5	79.61	5.69	LX1D8M6
230	104.77	8.29	LX1D8P5	—	—	—
240	125.25	8.89	LX1D8U5	97.04	6.75	LX1D8U6
277	—	—	—	125.75	8.89	LX1D8W6
380	338.51	22.26	LX1D8Q5	243.07	17.04	LX1D8Q6
400	368.43	25.55	LX1D8V5	—	—	—
415	368.43	27.65	LX1D8N5	—	—	—
440	441.56	30.34	LX1D8R5	338.51	22.26	LX1D8R6
480	—	—	—	368.43	25.55	LX1D8T6
500	566.62	38.12	LX1D8S5	—	—	—

## a.c coils for 3 or 4-pole contactors LC1D115, LC1D150

### Specifications

Average consumption at 20 °C:

■ inrush:  $\cos \phi = 0.9$  - 280 to 350 VA

■ sealed:  $\cos \phi = 0.9$  - 2 to 18 VA.

Operating range ( $\theta \leq 55$  °C): 0.8...1.15 Uc.

Coils with integral suppression device fitted as standard, class B.

Control circuit voltage Uc	Average resistance at 20 °C $\pm 10$ %	Inductance of closed circuit	Reference (1)	Average resistance at 20 °C $\pm 10$ %	Inductance of closed circuit	Reference (1)
V	$\Omega$	H		$\Omega$	H	
			50/60 Hz			
24	—	—	—	147	3.03	LX1D8B7
32	—	—	—	301	8.28	LX1D8C7
42	—	—	—	498	13.32	LX1D8D7
48	—	—	—	1061	24.19	LX1D8E7
110	—	—	—	4377	109.69	LX1D8F7
115	—	—	—	4377	109.69	LX1D8FE7
120	—	—	—	4377	109.69	LX1D8G7
127	—	—	—	6586	152.65	LX1D8FC7
208	—	—	—	10 895	260.15	LX1D8LE7
220	—	—	—	9895	210.72	LX1D8M7
230	—	—	—	9895	210.72	LX1D8P7
240	—	—	—	9895	210.72	LX1D8U7
277	—	—	—	21 988	533.17	LX1D8UE7
380	—	—	—	21 011	482.42	LX1D8Q7
400	—	—	—	21 011	482.42	LX1D8V7
415	—	—	—	21 011	482.42	LX1D8N7
440	—	—	—	21 501	507.47	LX1D8R7
480	—	—	—	32 249	938.41	LX1D8T7
500	—	—	—	32 249	938.41	LX1D8S7

(1) The last 2 digits in the reference represent the voltage code.



PB121387\_4998



LX4D7●D

### d.c. coils for 3-pole contactors LC1D80 or 4-pole contactors LP1D80

#### Specifications

Average consumption: 22 W.  
 Operating range: 0.85...1.1 Uc.

Control circuit voltage Uc	Average resistance at 20 °C ± 10%	Inductance of closed circuit	Reference <sup>(1)</sup>	Weight
V	Ω	H		kg
12	6.6	0.46	LX4D7JD	0.680
24	27	1.89	LX4D7BD	0.680
36	57	4	LX4D7CD	0.680
48	107	7.5	LX4D7ED	0.680
60	170	11.9	LX4D7ND	0.680
72	230	16.1	LX4D7SD	0.680
110	564	39.5	LX4D7FD	0.680
125	718	50.3	LX4D7GD	0.680
220	2215	155	LX4D7MD	0.680
250	2850	200	LX4D7UD	0.680
440	9195	640	LX4D7RD	0.680

<sup>(1)</sup> The last 2 digits in the reference represent the voltage code.



## d.c. coils for contactors LC1D115, D150

### Specifications

Consumption: inrush 270 to 365 W, sealed 2.4 to 5.1 W.

Operating range: 0.75...1.2 Uc.

Coils with integral suppression device fitted as standard, class B.

Control circuit voltage Uc	Average resistance at 20 °C ± 10 %	Inductance of closed circuit	Reference <sup>(1)</sup>	Weight
V	Ω	H		kg
24	147	3.03	<b>LX4D8BD</b>	0.300
48	1061	24.19	<b>LX4D8ED</b>	0.300
60	1673	38.44	<b>LX4D8ND</b>	0.300
72	2500	56.27	<b>LX4D8SD</b>	0.300
110	4377	109.69	<b>LX4D8FD</b>	0.300
125	6586	152.65	<b>LX4D8GD</b>	0.300
220	9895	210.72	<b>LX4D8MD</b>	0.300
250	18 022	345.40	<b>LX4D8UD</b>	0.300
440	21 501	684.66	<b>LX4D8RD</b>	0.300



LX4D8●D

## d.c. coils for 3-pole contactors LC1D80 or 4-pole contactors LP1D80

### Specifications

Wide range coils for specific applications

Average consumption: 23 W.

Operating range: 0.75 to 1.2 Uc.

Coils with "TH" treatment as standard.

Control circuit voltage Uc	Average resistance at 20 °C ± 10 %	Inductance of closed circuit	Reference <sup>(1)</sup>	Weight
V	Ω	H		kg
12	6.2	0.49	<b>LX4D7JW</b>	0.680
24	23.5	1.75	<b>LX4D7BW</b>	0.680
36	51.9	4.18	<b>LX4D7CW</b>	0.680
48	94.2	7	<b>LX4D7EW</b>	0.680
72	204	15.7	<b>LX4D7SW</b>	0.680
110	483	36	<b>LX4D7FW</b>	0.680
220	1922	144	<b>LX4D7MW</b>	0.680



LX4D7●●

<sup>(1)</sup> The last 2 digits in the reference represent the voltage code.



# TeSys

## TeSys SK Mini-contactors

### Product references



LC1SK06



LA1SK10

- Width of contactor 27 mm.
- Mounting on 35 mm rail.
- Screw clamp terminals.

#### Mini-contactors for motor in category AC-3

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 <sup>(1)</sup>				Rated operational voltage in AC-3 up to 400 V	Number of poles	Instantaneous auxiliary contacts	Basic reference. Complete with code indicating control circuit voltage <sup>(2)</sup>
220 V	380 V	660 V					
230 V	415 V	690 V					
kW	kW	kW	A				
1.1	2.2	2.2	6		2	–	LC1SK0600●●

#### Mini-contactors for motor in category AC-1

Non inductive loads maximum current ( $\theta \leq 55^\circ\text{C}$ ) utilisation category AC-1	Control circuit supply	Number of poles	Instantaneous auxiliary contacts	Basic reference. Complete with code indicating control circuit voltage <sup>(2)</sup>
<b>A</b>				
12	a.c.	2	–	LC1SK0600●●
	d.c.	2	–	LP1SK0600●●

#### Add-on block with 1 power pole (for 3-phase circuits)

For use on contactor	Number of poles	Instantaneous auxiliary contacts	Reference
LC1SK06 clip-on front mounting	1	1	LA1SK10
	1	–	LA1SK01

**Note:** Auxiliary contact blocks and coil suppressor module, see next page.

(1) For use in AC-3 category and 3-phase circuits, an **LA1SK●●** auxiliary contact block should be ordered separately for mounting on the contactor.

(2) Standard control circuit voltages (variable delivery times, please consult your Regional Sales Office):

#### Mini-contactors LC1SK

Volts ~ 50/60 Hz	24	48	110	120	220	230	240	380	400
Code	B7	E7	F7	G7	M7	P7	U7	Q7	V7

#### Mini-contactors LP1SK

Volts ~	12	24	36	48	72
Code	JD	BD	CD	ED	SD










LA1SK●●



LA4SK●1●





## Instantaneous auxiliary contact blocks

### Clip-on front mounting

For use on contactor	Maximum number of blocks per contactor	Composition	Reference
LC1SK06	1		LA1SK20
			LA1SK02
			LA1SK11

## Coil suppressor modules

**Clip-on fixing and electrical connection on right-hand side, without use of tools**

For use on contactors	Type	For voltages	Sold in lots of	Unit reference
LC1SK06 and LP1SK06	Varistor <sup>(1)</sup>	~ and  24 V...48 V	10	LA4SKE1E
		~ and  110 V...250 V	10	LA4SKE1U
	Diode <sup>(2)</sup>		10	LA4SKC1U
		 24 V...250 V		

(1) Protection provided by limiting the transient voltage to  $2 U_c$  max. Maximum reduction of transient voltage peaks. Slight increase in drop-out time (1.1 to 1.5 times the normal time).

(2) No overvoltage or oscillating frequency.

*Slight increase in drop-out time (1.1 to 1.5 times the normal time).*





LC1K0910●●



LC1K09103●●



LC1K09107●●



LC1K09105●●



LC7K0910●●

Mounting on 35 mm rail or Ø4 screw fixing.  
Screws in the open "ready-to-tighten" position.

Add-on auxiliary contact blocks and accessories, see pages B8/48 to B8/50.

### 3-pole contactors - Motor control 6 to 16 A in categories AC-3 AC-4 - a.c. coil

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3			Rated operational current in category AC-3 440 V up to	Instantaneous auxiliary contacts	Basic reference, to be completed by adding the voltage code <sup>(1)</sup>
220 V 230 V	380 V 415 V	440/500 V 660/690 V			
kW	kW	kW	A		
Screw clamp connections					
1.5	2.2	3	6	1 -	LC1K0610●●
				- 1	LC1K0601●●
2.2	4	4	9	1 -	LC1K0910●●
				- 1	LC1K0901●●
3	5.5	4 (> 440) 5.5 (440)	12	1 -	LC1K1210●●
				- 1	LC1K1201●●
4	7.5	4 (> 440) 5.5 (440)	16	1 -	LC1K1610●●
				- 1	LC1K1601●●

### Spring terminal connections <sup>(2)</sup>

For 6 to 12 A ratings only, in the references selected above, insert a figure **3** before the voltage code.  
Example: LC1K0610●● becomes LC1K06103●●.

### Faston connectors, 1 x 6.35 or 2 x 2.8

For 6 to 16 A ratings, in the references selected above, insert a figure **7** before the voltage code.  
Example: LC1K0610●● becomes LC1K06107●●.

### Solder pins for printed circuit boards

For 6 to 16 A ratings, in the references selected above, insert a figure **5** before the voltage code.  
Example: LC1K0610●● becomes LC1K06105●●.

### 3-pole silent contactors

Recommended for use in areas sensitive to noise, high interference mains supplies, etc.  
Coil with rectifier incorporated, suppressor fitted as standard.

### Screw clamp connections

1.5	2.2	3	6	1 -	LC7K0610●●
				- 1	LC7K0601●●
2.2	4	4	9	1 -	LC7K0910●●
				- 1	LC7K0901●●
3	5.5	4 (> 440) 5.5 (440)	12	1 -	LC7K1210●●
				- 1	LC7K1201●●

### Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure **7** before the voltage code.  
Example: LC7K0610●● becomes LC7K06107●●.

### Solder pins for printed circuit boards

In the references selected above, insert a figure **5** before the voltage code.  
Example: LC7K0610●● becomes LC7K06105●●.

### Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

#### Coil voltage codes - a.c. <sup>(3)</sup>

Contactors LC1K (0.8...1.15 Uc) (0.85...1.1 Uc)

Volts	12	20	24 <sup>(1)</sup>	36	42	48	110	115	120	127	200/208	220/230	230	230/240
50 Hz <sup>(4)</sup>			B5		D5	E5							P5	
50/60 Hz	J7	Z7	B7	C7	D7	E7	F7	FE7	G7	FC7	L7	M7	P7	U7
Volts	256	277	380/400		400	400/415	440	480	500	575	600	660/690		
50/60 Hz	W7	UE7	Q7	-	V7	N7		R7	T7	S7	SC7	X7	Y7	-

Up to and including 240 V, coil with integral suppression device available: add **2** to the code required. Example: **J72**.

Contactors LC7K (0.85...1.1 Uc)

Volts	24	42	48	110	115	220	230/240
50/60 Hz	B7	D7	E7	F7	FE7	M7	U7

<sup>(1)</sup> For mains supplies with a high level of interference (voltage surge > 800 V), use a suppressor module **LA4KE1FC** (50...129 V) or **LA4KE1UG** (130...250 V), see page B8/49.

<sup>(2)</sup> For **LC●K●●●●3 / LP●K●●●●3** with spring terminal, I<sub>th</sub> max = 10 A.

<sup>(3)</sup> (0.8...1.15 Uc) for single voltage coil; (0.85...1.1 Uc) for dual voltage coil, exemple 200/208 V AC.

<sup>(4)</sup> Only available for 'screw clamp terminals' versions.





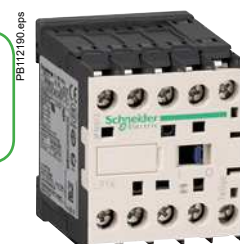
LP1K0910●●



LP1K09103●●



LP1K09107●●



LP1K09105●●



LP4K0910●●

Contactor selection according to utilisation category, see pages A6/34 to A6/39 and A6/42 to A6/45.  
Mounting on 35 mm rail or Ø4 screw fixing.  
Screws in the open "ready-to-tighten" position.

Add-on auxiliary contact blocks and accessories, see pages B8/48 to B8/50.

### 3-pole contactors - Motor control 6 to 12 A in categories AC-3 AC-4 - d.c. coil

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3			Rated operational current in category AC-3 440 V up to	Instantaneous auxiliary contacts	Basic reference, to be completed by adding the voltage code <sup>(1)</sup>
220 V	380 V	440/500 V			
230 V	415 V	660/690 V			
kW	kW	kW	A		
Screw clamp connections					
1.5	2.2	3	6	1 –	LP1K0610●●
				– 1	LP1K0601●●
2.2	4	4	9	1 –	LP1K0910●●
				– 1	LP1K0901●●
3	5.5	4 (> 440)	12	1 –	LP1K1210●●
		5.5 (440)		– 1	LP1K1201●●

### Spring terminal connections <sup>(2)</sup>

In the references selected above, insert a figure 3 before the voltage code.

Example: LP1K0610●● becomes LP1K06103●●.

### Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure 7 before the voltage code.

Example: LP1K0610●● becomes LP1K06107●●.

### Solder pins for printed circuit boards

In the references selected above, insert a figure 5 before the voltage code.

Example: LP1K0610●● becomes LP1K06105●●.

### 3-pole low consumption contactors

Compatible with programmable controller outputs.

Wide range coil (0.7...1.30 Uc), suppressor fitted as standard, consumption 1.8 W.

### Screw clamp connections

1.5	2.2	3	6	1 –	LP4K0610●●
				– 1	LP4K0601●●
2.2	4	4	9	1 –	LP4K0910●●
				– 1	LP4K0901●●
3	5.5	4 (> 440)	12	1 –	LP4K1210●●
		5.5 (440)		– 1	LP4K1201●●

### Spring terminal connections

In the references selected above, insert a figure 3 before the voltage code.

Example: LP4K0610●● becomes LP4K06103●●.

### Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure 7 before the voltage code.

Example: LP4K0610●● becomes LP4K06107●●.

### Solder pins for printed circuit boards

In the references selected above, insert a figure 5 before the voltage code.

Example: LP4K0610●● becomes LP4K06105●●.

### Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

d.c. supply (contactors LP1K: 0.8...1.15 Uc)

Volts	12	20	24 <sup>(1)</sup>	36	48	60	72	100	110	125	155	174	200	220	230	240	250
Code	JD	ZD	BD	CD	ED	ND	SD	KD	FD	GD	PD	QD	LD	MD	MPD	MUD	UD

Coil with integral suppression device available: add 3 to the code required. Example: JD3

### Low consumption (contactors LP4K: 0.7...1.3 Uc)

Volts	12	20	24	48	72	110	120
Code	JW3	ZW3	BW3	EW3	SW3	FW3	GW3

Coil with integral suppression device fitted as standard, by bi-directional peak limiting diode.

<sup>(1)</sup> For LP1K only, when connecting an electronic sensor or timer in series with the contactor coil, select a 20 V coil (~ control circuit voltage code Z7, ∞ control circuit voltage code ZD) so as to compensate for the incurred voltage drop.

<sup>(2)</sup> For LC●K●●●●●3 / LP●K●●●●●3 with spring terminal), I<sub>th</sub> max = 10 A.





LC1K09004●●



LC1K09103●●



LC1K09107●●



LC1K09004●●



Contactor selection according to utilisation category, see pages A6/40 and A6/41.

Mounting on 35 mm rail or Ø4 screw fixing.

Screws in the open "ready-to-tighten" position.

Add-on auxiliary contact blocks and accessories, see pages B8/48 to B8/50.

### 3 or 4-pole contactors - Load control up to 20 A in category AC-1 - a.c. coil <sup>(1)</sup>

Non-inductive loads Category AC-1 Maximum current at $\theta \leq 50\text{ }^{\circ}\text{C}$	Number of poles 	Instantaneous auxiliary contacts 	Basic reference, to be completed by adding the voltage code <sup>(2)</sup>		
A					
Screw clamp connections					
20	3	—	1	—	LC1K0910●●
	or LC1K1210●●				
	3	—	—	1	LC1K0901●●
	or LC1K1201●●				
	4	—	—	—	LC1K09004●●
or LC1K12004●●					
2	2	—	—		LC1K09008●●

### Spring terminal connections <sup>(3)</sup>

In the references selected above, insert a figure **3** before the voltage code.

Example: LC1K0910●● becomes LC1K09103●●.

### Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure **7** before the voltage code.

Example: LC1K0910●● becomes LC1K09107●●.

### Solder pins for printed circuit boards

In the references selected above, insert a figure **5** before the voltage code.

Example: LC1K0910●● becomes LC1K09105●●.

### 3 or 4-pole silent contactors <sup>(1)</sup>

Recommended for use in areas sensitive to noise, high interference mains supplies, etc.

Coil with rectifier incorporated, suppressor fitted as standard.

### Screw clamp connections

20	3	—	1	—	LC7K0910●● or LC7K1210●●
	3	—	—	1	LC7K0901●● or LC7K1201●●
	4	—	—	—	LC7K09004●● or LC7K12004●●
	2	2	—	—	LC7K09008●●

### Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure **7** before the voltage code.

Example: LC7K0910●● becomes LC7K09107●●.

### Solder pins for printed circuit boards

In the references selected above, insert a figure **5** before the voltage code.

Example: LC7K0910●● becomes LC7K09105●●.

<sup>(1)</sup> Coordination tables between 9 and 12 A ratings according to number of operating cycles, see AC-1 curve on page A6/40.

### Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

#### Coil voltage codes - a.c. <sup>(4)</sup>

Contactors LC1K (0.8...1.15 Uc) (0.85...1.1 Uc)

Volts	12	20	24 <sup>(2)</sup>	36	42	48	110	115	120	127	200/208	220/230	230	230/240
50 Hz <sup>(5)</sup>			B5		D5	E5							P5	
50/60 Hz	J7	Z7	B7	C7	D7	E7	F7	FE7	G7	FC7	L7	M7	P7	U7
Volts	256	277	380/400		400	400/415	440	480	500	575	600	660/690		
50/60 Hz	W7	UE7	Q7		V7	N7		R7	T7	S7	SC7	X7	Y7	

Up to and including 240 V, coil with integral suppression device available: add **2** to the code required. Example: **J72**.

Contactors LC7K (0.8...1.1 Uc)

Volts	24	42	48	110	115	220	230/240
50/60 Hz	B7	D7	E7	F7	FE7	M7	U7

<sup>(2)</sup> For mains supplies with a high level of interference (voltage surge > 800 V), use a suppressor module **LA4KE1FC** (50...129 V) or **LA4KE1UG** (130...250 V), see page B8/49.

<sup>(3)</sup> For **LC●K●●●●●3/LP●K●●●●●3** with spring terminal,  $I_{th\ max} = 10\text{ A}$ .

<sup>(4)</sup> (0.8...1.15 Uc) for single voltage coil; (0.85...1.1 Uc) for dual voltage coil, exemple 200/208 V AC.

<sup>(5)</sup> Only available for 'screw clamp terminals' versions.





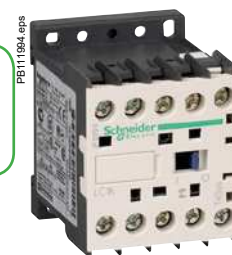
LC1K09004●●



LC1K09103●●



LC1K09105●●



LC1K09004●●

Contactor selection according to utilisation category, see pages A6/40 and A6/41.

Mounting on 35 mm rail or Ø4 screw fixing.

Screws in the open "ready-to-tighten" position.

Add-on auxiliary contact blocks and accessories, see pages B8/48 to B8/50.

### 3 and 4-pole contactors - Load control - 20 A in category AC-1 - d.c. coil <sup>(1)</sup>

Non-inductive loads Category AC-1 Maximum current at $\theta \leq 50^\circ\text{C}$	Number of poles	Instantaneous auxiliary contacts	Basic reference, to be completed by adding the voltage code <sup>(2)</sup>
<b>A</b>			
<b>Screw clamp connections</b>			
20	3	1	LP1K0910●● or LP1K1210●●
	3	1	LP1K0901●● or LP1K1201●●
	4	—	LP1K09004●● or LP1K12004●●
	2	2	LP1K09008●●

### Spring terminal connections <sup>(3)</sup>

In the references selected above, insert a figure 3 before the voltage code.

Example: LP1K0910●● becomes LP1K09103●●.

### Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure 7 before the voltage code.

Example: LP1K0910●● becomes LP1K09107●●.

### Solder pins for printed circuit boards

In the references selected above, insert a figure 5 before the voltage code.

Example: LP1K0910●● becomes LP1K09105●●.

### 3 or 4-pole 20 A / AC-1 - d.c. low consumption coil <sup>(1)</sup>

Compatible with programmable controller outputs.

Wide range coil (0.7...1.30 Uc), suppressor fitted as standard, consumption 1.8 W.

<b>Screw clamp connections</b>			
20	3	1	LP4K0910●●● or LP4K1210●●●
	3	1	LP4K0901●●● or LP4K1201●●●
	4	—	LP4K09004●●● or LP4K12004●●●
	2	2	LP4K09008●●●

### Spring terminal connections

In the references selected above, insert a figure 3 before the voltage code.

Example: LP4K0910●● becomes LP4K09103●●.

### Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure 7 before the voltage code.

Example: LP4K0910●● becomes LP4K09107●●.

### Solder pins for printed circuit boards

In the references selected above, insert a figure 5 before the voltage code.

Example: LP4K0910●● becomes LP4K09105●●.

<sup>(1)</sup> Coordination tables between 9 and 12 A ratings according to number of operating cycles, see AC-1 curve on page A6/40.

### Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

#### Coil voltage codes - d.c. (contactors LP1K: 0.8...1.15 Uc)

Volts ---	12	20	24 <sup>(2)</sup>	36	48	60	72	100	110	125	155	174	200	220	230	240	250
Code	JD	ZD	BD	CD	ED	ND	SD	KD	FD	GD	PD	QD	LD	MD	MPD	MUD	UD

Coil with integral suppression device available: add 3 to the code required. Example: JD3.

#### Coil voltage codes - low consumption d.c. (contactors LP4K: 0.7...1.3 Uc)

Volts ---	12	20	24	48	72	110	120
Code	JW3	ZW3	BW3	EW3	SW3	FW3	GW3

Coil with integral suppression device fitted as standard, by bi-directional peak limiting diode.

<sup>(2)</sup> For LP1K only, when connecting an electronic sensor or timer in series with the contactor coil, select a 20 V coil (~ control circuit voltage code Z7, --- control circuit voltage code ZD) so as to compensate for the incurred voltage drop.

<sup>(3)</sup> For LC●K●●●●3 / LP●K●●●●3 with spring terminal, I<sub>th</sub> max = 10 A.





LC2K0910●●



LC2K09105●●

Reversing contactor selection according to utilisation category, see pages A6/34 to A6/39 and A6/42 to A6/45. Integral mechanical interlock.

It is essential to link the contacts of the electrical interlock.

Pre-wired power circuit connections as standard on screw clamp versions.

Mounting on 35 mm rail or Ø4 screw fixing. Screws in the open "ready-to-tighten" position.

Add-on auxiliary contact blocks and accessories, see pages B8/48 to B8/50.

### 3-pole reversing contactors - Motor control 6 to 16 A in categories AC-3 AC-4 - a.c. coil

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3			Rated operational current in category AC-3 440 V up to	Instantaneous auxiliary contacts per contactor	Basic reference, to be completed by adding the voltage code <sup>(1)</sup>
220 V 230 V	380 V 415 V	440/500 V 660/690 V			
kW	kW	kW	A		
<b>Screw clamp connections</b>					
1.5	2.2	3	6	1 –	LC2K0610●●
				– 1	LC2K0601●●
2.2	4	4	9	1 –	LC2K0910●●
				– 1	LC2K0901●●
3	5.5	4 (> 440)	12	1 –	LC2K1210●●
		5.5 (440)		– 1	LC2K1201●●
4	7.5	4 (> 440)	16	1 –	LC2K1610●●
		5.5 (440)		– 1	LC2K1601●●

#### Spring terminal connections <sup>(2)</sup>

For 6 to 12 A ratings only, in the references selected above, insert a figure **3** before the voltage code.

Example: LC2K0610●● becomes LC2K06103●●.

#### Faston connectors, 1 x 6.35 or 2 x 2.8

For 6 to 16 A ratings, in the references selected above, insert a figure **7** before the voltage code.

Example: LC2K0610●● becomes LC2K06107●●.

#### Solder pins for printed circuit boards

For 6 to 16 A ratings, in the references selected above, insert a figure **5** before the voltage code.

Example: LC2K0610●● becomes LC2K06105●●.

### 3-pole silent reversing contactors - 6 to 16 A categories AC-3 AC-4 - a.c. coil

Recommended for use in areas sensitive to noise, high interference mains supplies, etc.

Coil with rectifier incorporated, suppressor fitted as standard.

<b>Screw clamp connections</b>					
1.5	2.2	3	6	1 –	LC8K0610●●
				– 1	LC8K0601●●
2.2	4	4	9	1 –	LC8K0910●●
				– 1	LC8K0901●●
3	5.5	4 (> 440)	12	1 –	LC8K1210●●
		5.5 (440)		– 1	LC8K1201●●

#### Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure **7** before the voltage code.

Example: LC8K0610●● becomes LC8K06107●●.

#### Solder pins for printed circuit boards

In the references selected above, insert a figure **5** before the voltage code.

Example: LC8K0610●● becomes LC8K06105●●.

### Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

#### Coil voltage codes - a.c. <sup>(3)</sup>

Reversing contactors LC2K (0.8...1.15 Uc) (0.85...1.1 Uc)													
Volts	12	20	24 <sup>(1)</sup>	36	42	48	110	115	120	127	200/208	220/230	230 230/240
50/60 Hz	J7	Z7	B7	C7	D7	E7	F7	FE7	G7	FC7	L7	M7	P7 U7
Volts	256	277	380/400	400	400/415	440	480	500	575	600	660/690		
50/60 Hz	W7	UE7	Q7		V7	N7		R7	T7	S7	SC7	X7	Y7

Up to and including 240 V, coil with integral suppression device available: add **2** to the code required. Example: **J72**.

#### Reversing contactors LC8K (0.8...1.1 Uc)

Volts	24	42	48	110	115	220	230/240
50/60 Hz	B7	D7	E7	F7	FE7	M7	U7

<sup>(1)</sup> For mains supplies with a high level of interference (voltage surge > 800 V), use a suppressor module **LA4KE1FC** (50...129 V) or **LA4KE1UG** (130...250 V), see page B8/49.

<sup>(2)</sup> For **LC●K●●●●3 / LP●K●●●●3** with spring terminal, I<sub>th</sub> max = 10 A.

<sup>(3)</sup> (0.8...1.15 Uc) for single voltage coil; (0.85...1.1 Uc) for dual voltage coil, exemple 200/208 V AC.



Reversing contactor selection according to utilisation category, see pages A6/34 to A6/39 and A6/42 to A6/45.  
Integral mechanical interlock.  
It is essential to link the contacts of the electrical interlock.  
Pre-wired power circuit connections as standard on screw clamp versions.  
Mounting on 35 mm rail or Ø4 screw fixing.  
Screws in the open "ready-to-tighten" position.  
Add-on auxiliary contact blocks and accessories, see pages B8/48 to B8/50.

### 3-pole reversing contactors - Motor control 6 to 12 A in categories AC-3 AC-4 - d.c. coil

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3			Rated operational current in category AC-3 440 V up to	Instantaneous auxiliary contacts per contactor	Basic reference, to be completed by adding the voltage code <sup>(1)</sup>
220 V	380 V	440/500 V			
230 V	415 V	660/690 V			
kW	kW	kW	A		
<b>Screw clamp connections</b>					
1.5	2.2	3	6	1 –	LP2K0610●●
				– 1	LP2K0601●●
2.2	4	4	9	1 –	LP2K0910●●
				– 1	LP2K0901●●
3	5.5	4 (> 440)	12	1 –	LP2K1210●●
		5.5 (440)		– 1	LP2K1201●●

#### Spring terminal connections<sup>(2)</sup>

In the references selected above, insert a figure **3** before the voltage code.  
Example: LP2K0610●● becomes LP2K06103●●.

#### Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure **7** before the voltage code.  
Example: LC2K0610●● becomes LC2K06107●●.

#### Solder pins for printed circuit boards

For 6 to 16 A ratings, in the references selected above, insert a figure **5** before the voltage code.  
Example: LC2K0610●● becomes LC2K06105●●.

### 3-pole low consumption reversing contactors

Compatible with programmable controller outputs.  
Wide range coil (0.7...1.30 Uc), suppressor fitted as standard, consumption 1.8 W.

#### Screw clamp connections

1.5	2.2	3	6	1 –	LP5K0610●●
				– 1	LP5K0601●●
2.2	4	4	9	1 –	LP5K0910●●
				– 1	LP5K0901●●
3	5.5	4 (> 440)	12	1 –	LP5K1210●●
		5.5 (440)		– 1	LP5K1201●●

#### Spring terminal connections

In the references selected above, insert a figure **3** before the voltage code.  
Example: LP5K0610●● becomes LP5K06103●●.

#### Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure **7** before the voltage code.  
Example: LP5K0610●● becomes LP5K06107●●.

#### Solder pins for printed circuit boards

In the references selected above, insert a figure **5** before the voltage code.  
Example: LP5K0610●● becomes LP5K06105●●.

### Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

#### Coil voltage codes - d.c.

Reversing contactors LP2K (0.8...1.15 Uc)

Volts	12	20	24 <sup>(1)</sup>	36	48	60	72	100	110	125	155	174	200	220	230	240	250
Code	JD	ZD	BD	CD	ED	ND	SD	KD	FD	GD	PD	QD	LD	MD	MPD	MUD	UD

Coil with integral suppression device available: add **3** to the code required. Example: **JD3**.

#### Coil voltage codes - low consumption d.c.

Reversing contactors LP5K (0.7...1.3 Uc)

Volts	12	20	24	48	72	110	120
Code	JW3	ZW3	BW3	EW3	SW3	FW3	GW3

Coil with integral suppression device fitted as standard, by bi-directional peak limiting diode.

<sup>(1)</sup> For LP2K only, when connecting an electronic sensor or timer in series with the contactor coil, select a 20 V coil (~ control circuit voltage code Z7, ∴ control circuit voltage code ZD) so as to compensate for the incurred voltage drop.

<sup>(2)</sup> For LC●K●●●●●3 / LP●K●●●●●3 with spring terminal, I<sub>th</sub> max = 10 A.



# TeSys

## TeSys K Reversing contactors

### Product references



LC2K0910●●



LC2K09105●●



LC2K09107●●

**Warning: reversing contactors LC2K0910●● and LC2K0901●● are pre-wired for reverse motor operation as standard.**

Reversing contactor selection according to utilisation category, see pages A6/40 and A6/41.

Integral mechanical interlock.

**It is essential to link the contacts of the electrical interlock.**

Mounting on 35 mm rail or Ø4 screw fixing.

Screws in the open "ready-to-tighten" position.

Add-on auxiliary contact blocks and accessories, see pages B8/48 to B8/50.

### 3 or 4-pole reversing contactors - Load control - 20 A in category AC-1 - a.c. coil <sup>(1)</sup>

Non-inductive loads Category AC-1 Maximum current at $\theta \leq 50^\circ\text{C}$	Number of poles	Instantaneous auxiliary contacts per contactor	Basic reference, to be completed by adding the voltage code <sup>(2)</sup>

Screw clamp connections				
20	3	—	1	—
				or
	3	—	—	1
				or
	4	—	—	—
				or

### Spring terminal connections <sup>(3)</sup>

In the references selected above, insert a figure 3 before the voltage code.

Example: LC2K0910●● becomes LC2K09103●●.

### Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure 7 before the voltage code.

Example: LC2K0910●● becomes LC2K09107●●.

### Solder pins for printed circuit boards

In the references selected above, insert a figure 5 before the voltage code.

Example: LC2K0910●● becomes LC2K09105●●.

### 3 or 4-pole silent reversing contactors - 20 A / AC-1 - a.c. coil <sup>(1)</sup>

Recommended for use in areas sensitive to noise, high interference mains supplies, etc.

Coil with rectifier incorporated, suppressor fitted as standard.

Screw clamp connections				
20	3	—	1	—
				or
	3	—	—	1
				or
	4	—	—	—
				or

### Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure 7 before the voltage code.

Example: LC8K0910●● becomes LC8K09107●●.

### Solder pins for printed circuit boards

In the references selected above, insert a figure 5 before the voltage code.

Example: LC8K0910●● becomes LC8K09105●●.

<sup>(1)</sup> Coordination tables between 9 and 12 A ratings according to number of operating cycles, see AC-1 curve on page A6/40.

### Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

#### Coil voltage codes - a.c. <sup>(4)</sup>

Reversing contactors LC2K (0.8...1.15 Uc) (0.85...1.1 Uc)

Volts	12	20	24 <sup>(2)</sup>	36	42	48	110	115	120	127	200/208	220/230	230	230/240
50/60 Hz	J7	Z7	B7	C7	D7	E7	F7	FE7	G7	FC7	L7	M7	P7	U7
Volts	256	277	380/400	400	400/415	440	480	500	575	600	660/690			
50/60 Hz	W7	UE7	Q7	V7	N7	R7	T7	S7	SC7	X7	Y7			

Up to and including 240 V, coil with integral suppression device available: add 2 to the code required. Example: J72.

Reversing contactors LC8K (0.8...1.1 Uc)

Volts	24	42	48	110	115	220	230/240
50/60 Hz	B7	D7	E7	F7	FE7	M7	U7

<sup>(2)</sup> For mains supplies with a high level of interference (voltage surge > 800 V), use a suppressor module LA4KE1FC (50...129 V) or LA4KE1UG (130...250 V), see page B8/49.

<sup>(3)</sup> For LC●K●●●●3 / LP●K●●●●3 with spring terminal, I<sub>th</sub> max = 10 A.

<sup>(4)</sup> (0.8...1.15 Uc) for single voltage coil; (0.85...1.1 Uc) for dual voltage coil, exemple 200/208 V AC.



**Warning:** reversing contactors LP2K0910●● and LP2K0901●● are pre-wired for reverse motor operation as standard.

Reversing contactor selection according to utilisation category, see pages A6/40 and A6/41.

Integral mechanical interlock.



**It is essential to link the contacts of the electrical interlock.**

Mounting on 35 mm rail or Ø4 screw fixing.

Screws in the open "ready-to-tighten" position.

Add-on auxiliary contact blocks and accessories, see pages B8/48 to B8/50.

### 3 or 4-pole reversing contactors - Load control - 20 A in category AC-1 - d.c. coil <sup>(1)</sup>

Non-inductive loads Category AC-1 Maximum current at $\theta \leq 50^\circ\text{C}$	Number of poles	Instantaneous auxiliary contacts per contactor	Basic reference, to be completed by adding the voltage code <sup>(2)</sup>
			
<b>A</b>			
<b>Screw clamp connections</b>			
20	3	1	LP2K0910●● or LP2K1210●●
	3	1	LP2K0901●● or LP2K1201●●
	4	—	LP2K09004●● or LP2K12004●●

#### Spring terminal connections <sup>(3)</sup>

In the references selected above, insert a figure **3** before the voltage code.

Example: LP2K0910●● becomes LP2K09103●●.

#### Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure **7** before the voltage code.

Example: LP2K0910●● becomes LP2K09107●●.

#### Solder pins for printed circuit boards

In the references selected above, insert a figure **5** before the voltage code.

Example: LP2K0910●● becomes LP2K09105●●.

### 3 or 4-pole reversing contactors - 20 A / AC-1 - d.c. low consumption coil <sup>(1)</sup>

Compatible with programmable controller outputs.

Wide range coil (0.7...1.30 U<sub>c</sub>), suppressor fitted as standard, consumption 1.8 W.

#### Screw clamp connections

20	3	1	LP5K0910●●● or LP5K1210●●●
	3	1	LP5K0901●●● or LP5K1201●●●
	4	—	LP5K09004●●● or LP5K12004●●●

#### Spring terminal connections

In the references selected above, insert a figure **3** before the voltage code.

Example: LP5K0910●● becomes LP5K09103●●.

#### Faston connectors, 1 x 6.35 or 2 x 2.8

In the references selected above, insert a figure **7** before the voltage code.

Example: LP5K0910●● becomes LP5K09107●●.

#### Solder pins for printed circuit boards

In the references selected above, insert a figure **5** before the voltage code.

Example: LP5K0910●● becomes LP5K09105●●.

<sup>(1)</sup> Coordination tables between 9 and 12 A ratings according to number of operating cycles, see AC-1 curve on page A6/40.

### Standard control circuit voltages (for other voltages, please consult your Regional Sales office)

#### Coil voltage codes - d.c. (reversing contactors LP2K: 0.8...1.15 U<sub>c</sub>)

Volts ∴	12	20	24 <sup>(2)</sup>	36	48	60	72	100	110	125	155	174	200	220	230	240	250
Code	JD	ZD	BD	CD	ED	ND	SD	KD	FD	GD	PD	QD	LD	MD	MPD	MUD	UD

Coil with integral suppression device available: add **3** to the code required. Example: **JD3**.

#### Coil voltage codes - low consumption d.c. (reversing contactors LP5K: 0.7...1.3 U<sub>c</sub>)

Volts ∴	12	20	24	48	72	110	120
Code	JW3	ZW3	BW3	EW3	SW3	FW3	GW3

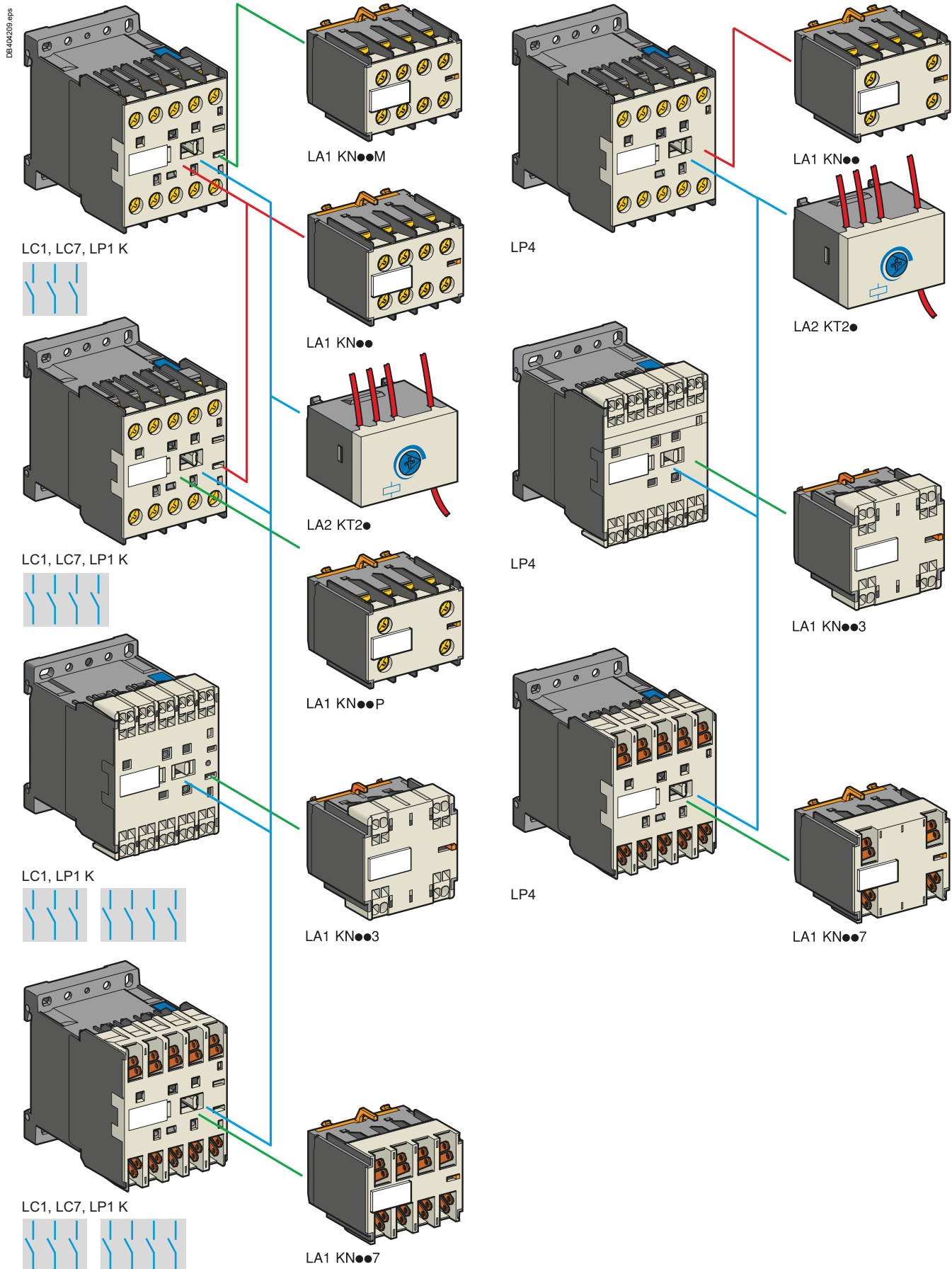
Coil with integral suppression device fitted as standard, by bi-directional peak limiting diode.

<sup>(2)</sup> For LP2K only, when connecting an electronic sensor or timer in series with the contactor coil, select a 20 V coil (~ control circuit voltage code Z7, ∴ control circuit voltage code ZD) so as to compensate for the incurred voltage drop.

<sup>(3)</sup> For LC●K●●●●3 / LP●K●●●●3 with spring terminal, I<sub>th</sub> max = 10 A.









# TeSys

## TeSys K contactors - Auxiliary contacts blocks

### Product references



LA1KN22



LA1KN23



LA1KN27



Contactors

#### Instantaneous auxiliary contact blocks

Recommended for standard applications. Clip-on front mounting, 1 block per contactor

Connection	For use on contactors	Composition		Reference
Screw clamp terminals	All products with screw clamp terminals	2	—	LA1KN20
		—	2	LA1KN02
		1	1	LA1KN11
	All products with screw clamp terminals except low consumption	4	—	LA1KN40
		3	1	LA1KN31
		2	2	LA1KN22
		1	3	LA1KN13
		—	4	LA1KN04
Spring terminals	All products with spring terminals	2	—	LA1KN203
		—	2	LA1KN023
		1	1	LA1KN113
	All products with spring terminals except low consumption	4	—	LA1KN403
		3	1	LA1KN313
		2	2	LA1KN223
		1	3	LA1KN133
		—	4	LA1KN043
Faston connectors, 1 x 6.35 or 2 x 2.8	All products with Faston connectors	2	—	LA1KN207
		—	2	LA1KN027
		1	1	LA1KN117
	All products with Faston connectors except low consumption	4	—	LA1KN407
		3	1	LA1KN317
		2	2	LA1KN227
		1	3	LA1KN137
		—	4	LA1KN047

#### With terminal referencing to standard EN 50012. Clip-on front mounting, 1 block per contactor

Screw clamp terminals with referencing conforming to standard EN 50012	All 3-pole + N/O products with screw clamp terminals except LP4 and LP5K12	—	2	LA1KN02M
		1	1	LA1KN11M
	All 3-pole + N/O products with screw clamp terminals except LP4 or LP5K06, K09 and K12	3	1	LA1KN31M
		2	2	LA1KN22M
		1	3	LA1KN13M
	All 4-pole products with screw terminals except LP4 or LP5K12	1	1	LA1KN11P
	All 4-pole products with screw clamp terminals except LP4 or LP5K09 and K12	2	2	LA1KN22P

#### Electronic time delay auxiliary contact blocks

Relay output with common point changeover contact,  $\sim$  or  $\equiv$  240 V, 2 A maximum.

Control voltage 0.85...1.1 Uc.

Maximum switching capacity 250 VA or 150 W.

Operating temperature -10...+60 °C.

Reset time: 1.5 s during the time delay period, 0.5 s after the time delay period.

#### Clip-on front mounting, 1 block per contactor

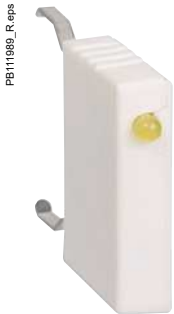
Voltage	Type	Timing range	Composition	Reference
<b>V</b>		<b>s</b>		
$\sim$ or $\equiv$ 24...48	On-delay	1...30	1	LA2KT2E
$\sim$ 110...240	On-delay	1...30	1	LA2KT2U



# TeSys

## TeSys K contactors - Suppressor modules

### Product references



LA4K●●●

References				
Mounting and connection	Type	For voltages	Sold in lots of	Unit reference
Clip-on fixing on the front of contactors LC1 and LP1, with locating device. No tools required.	Varistor <sup>(1)</sup>	~ and ~ 12...24 V	5	LA4KE1B
		~ and ~ 32...48 V	5	LA4KE1E
		~ and ~ 50...129 V	5	LA4KE1FC
		~ and ~ 130...250 V	5	LA4KE1UG
	Diode + Zener diode <sup>(2)</sup>	~ 12...24 V	5	LA4KC1B
		~ 32...48 V	5	LA4KC1E
	RC <sup>(3)</sup>	~ 110...250 V	5	LA4KA1U

- (1) Protection provided by limiting the transient voltage to 2 Uc max.  
Maximum reduction of transient voltage peaks.  
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
- (2) No overvoltage or oscillating frequency.  
Polarised component.  
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
- (3) Protection by limiting the transient voltage to 3 Uc max. and limitation of the oscillating frequency.  
Slight increase in drop-out time (1.2 to 2 times the normal time).



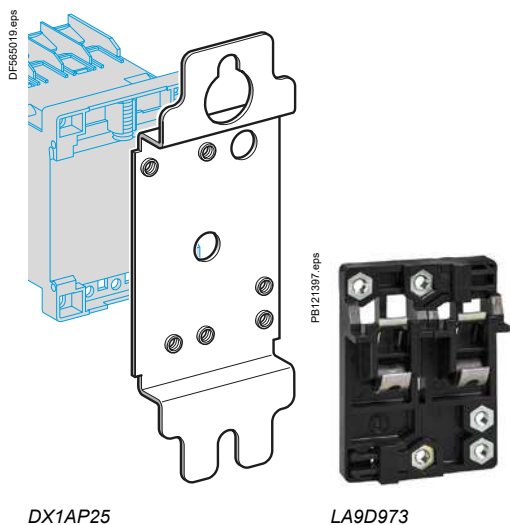
Contactors



# TeSys

## TeSys K contactors - Accessories

### Product references



Mounting and marking accessories				
Description	Application		Sold in lots of	Unit reference
Mounting plates <sup>(1)</sup>	For fixing on 1 rail	Clip-on	1	LA9D973
	For fixing on 2 rails	110/120 mm fixing centres	10	DX1AP25
Marker holder	Clip-on	Onto front of contactor	100	LA9D90
Clip-in markers	4 maximum per contactor	Strips of 10 identical numbers 0...9	25	AB1R● <sup>(2)</sup>
		Strips of 10 identical letters A...Z	25	AB1G● <sup>(2)</sup>



Connection accessories				
Description	Application		Sold in lots of	Unit preference
Paralleling links	For 2 poles	With screw clamps	4	LA9E01
	For 4 poles	With screw clamps	2	LA9E02
Set of 6 power connections	For 3-pole reversing contactors for motor control	For contactors with screw clamp terminals	100	LA9K0969

- <sup>(1)</sup> Order 1 mounting plate for fixing a contactor and 2 mounting plates for fixing a reversing contactor.
- <sup>(2)</sup> Complete the reference by replacing the dot with the required character.



#### Control Panel Technical Guide:

Mounting and wiring accessories for TeSys D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications - Product references and details on all kits and wiring accessories.

> Ref. Document: CPTG011\_EN



> Click on QR code to download



# TeSys

## TeSys SKGC Mini-contactors

### Product references



LC1SKGC200



LC1SKGC400

Mini-contactors 25 and 47 mm pitch for use in modular panels.

- Mounting on 35 mm rail or fixing by four Ø4 screws, except for LC1SKGC200.
- Connection by connectors.
- Mini-contactor fitted with transparent, sealable protective cover to prevent front face access.

Mini-contactors, width 27 mm								
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3			Rated operational current in AC-3 up to 400 V	Non inductive loads category AC-1 maximum current $\theta \leq 50^\circ\text{C}$	No. of poles			Basic reference, to be completed by adding the voltage code <sup>(1)</sup>
220 V	380 V	660 V			1	2	3	
230 V	415 V	690 V						
kW	kW	kW	A	A				
–	–	–	5	20	2	–	–	LC1SKGC200●●

Mini-contactors, width 45 mm								
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3			Rated operational current in AC-3 up to 400 V	Non inductive loads category AC-1 maximum current $\theta \leq 50^\circ\text{C}$	No. of poles			Basic reference, to be completed by adding the voltage code <sup>(1)</sup>
220 V	380 V	660 V			1	2	3	
230 V	415 V	690 V						
kW	kW	kW	A	A				
1.1	4	4	9	20	3	1	–	LC1SKGC310●●
					3	–	1	LC1SKGC301●●
					4	–	–	LC1SKGC400●●

<sup>(1)</sup> Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts ~ 50/60 Hz	24	48	110	120	220	230	240	380	400
Code	B7	E7	F7	G7	M7	P7	U7	Q7	V7





TeSys

TeSys SKGC Mini-contactors - Supressor modules

Product references



Suppressor modules				
Connection without need for tools by clipping onto right-hand side of contactor				
For use on contactors	Type	For voltages	Sold in lots of	Unit reference
LC1SKGC	Varistor <sup>(1)</sup>	~ and ≡ 24...48 V	10	LA4SKE1E
		~ and ≡ 110...250 V	10	LA4SKE1U
	Diode <sup>(2)</sup>	≡ 24...250 V	10	LA4SKC1U

- (1) Protection provided by limiting the transient voltage to 2 Uc max.  
Maximum reduction of transient voltage peaks.  
Slight increase in drop-out time (1.1 to 1.5 times the normal time).
- (2) No overvoltage or oscillating frequency.  
Slight increase in drop-out time (1.1 to 1.5 times the normal time).



Contactors



# TeSys

## TeSys GC Contactors

### Product references





GC2520



GC4040



GC10020

TeSys GC Contactors - modular - 17.5 mm pitch for modular panels								
No. of poles		Number of 17.5 mm modules	Commercial reference 50 Hz coil - different voltages					Sold in lots of
			12 V	24 V	48 V	110 V	220/240 V	
Maximum current rating category AC-7a - 16 A								
1	—	1	GC1610J5	GC1610B5	GC1610E5	GC1610F5	GC1610M5 ★	12
1	1	1	GC1611J5	GC1611B5	—	GC1611F5	GC1611M5 ★	12
2	—	1	GC1620J5	GC1620B5	GC1620E5	GC1620F5 ★	GC1620M5 ★	12
2	2	2	—	GC1622B5	GC1622E5	GC1622F5 ★	GC1622M5	6
3	—	2	—	—	—	—	GC1630B5 GC1630M5 ★	6
4	—	2	—	GC1640B5	—	GC1640F5	GC1640M5 ★	6
Maximum current rating category AC-7a - 25 A								
—	2	1	—	GC2502B5	GC2502E5	★	GC2502M5 ★	12
—	4	2	—	GC2504B5	GC2504E5	★	GC2504M5 ★	6
1	—	1	—	GC2510B5	—	—	GC2510M5 ★	12
1	1	1	—	GC2511B5	—	GC2511F5	GC2511M5 ★	12
2	—	1	GC2520J5	GC2520B5	GC2520E5	GC2520F5 ★	GC2520M5 ★	12
2	2	2	—	GC2522B5	GC2522E5	GC2522F5	GC2522M5 ★	6
3	—	2	—	GC2530B5	—	GC2530F5	GC2530M5 ★	6
3	1	2	—	—	—	—	GC2531M5	6
4	—	2	GC2540J5	GC2540B5	GC2540E5	GC2540F5 ★	GC2540M5 ★	6
Maximum current rating category AC-7a - 40 A								
—	2	2	—	GC4002B5	—	—	GC4002M5 ★	6
—	4	3	—	GC4004B5	—	GC4004F5 ★	GC4004M5	4
1	1	2	—	GC4011B5	—	—	GC4011M5 ★	6
2	—	2	—	GC4020B5	—	GC4020F5 ★	GC4020M5 ★	6
2	2	3	—	—	—	—	GC4022M5	4
3	—	3	—	GC4030B5	—	GC4030F5	GC4030M5 ★	4
4	—	3	—	GC4040B5	GC4040E5	GC4040F5 ★	GC4040M5 ★	4
Maximum current rating category AC-7a - 63 A								
—	2	2	—	—	—	—	GC6302M5	6
—	4	3	—	GC6304B5	—	—	GC6304M5	4
1	1	2	—	—	—	—	GC6311M5	6
2	—	2	—	—	—	—	GC6320M5	6
2	2	3	—	—	—	GC6322F5	GC6322M5	4
3	—	3	—	GC6330B5	—	GC6330F5	GC6330M5 ★	4
4	—	3	—	GC6340B5	GC6340E5	GC6340F5 ★	GC6340M5 ★	4
Maximum current rating category AC-7a - 100 A								
2	—	3	—	—	—	—	GC10020M5	4
4	—	6	—	GC10040B5	—	—	GC10040M5 ★	2

★ for 60 Hz coil replace last figure 5 by 6.



# TeSys

## TeSys GY "Dual tariff" contactors

### Product references



TeSys GY "dual tariff" contactors - modular - 17.5 mm pitch for modular panels							
No. of poles		Number of 17.5 mm modules	Commercial reference 50 Hz coil - different voltages				
			12 V	24 V	48 V	110 V	220/240 V
Maximum current rating category AC-7a - 16 A							
2	—	1	—	GY1620B5	—	—	GY1620M5 12
4	—	2	—	—	—	—	GY1640M5 6
Maximum current rating category AC-7a - 25 A							
2	—	1	—	GY2520B5	—	—	GY2520M5 ★ 12
3	—	2	—	—	—	—	GY2530M5 6
4	—	2	—	GY2540B5	—	—	GY2540M5 6
Maximum current rating category AC-7a - 40 A							
2	—	2	—	—	—	—	GY4020M5 6
3	—	3	—	—	—	—	GY4030M5 4
4	—	3	—	GY4040B5	—	—	GY4040M5 4
Maximum current rating category AC-7a - 63 A							
2	—	2	—	—	—	—	GY6320M5 6
4	—	3	—	GY6340B5	—	—	GY6340M5 4

★ for 60 Hz coil replace last figure 5 by 6.





Contactors



TeSys  
TeSys GF impulse relays  
Product references



GF1610M7

TeSys GF impulse relays - modular - 17.5 mm pitch for modular panels						
Maximum current rating category AC-1	Composition		Coil voltages		Sold in lots of	Unit reference
			~ 50/60 Hz	---		
A			V	V		
16	1	—	12	6	12	GF1610J7
			24	12	12	GF1610B7
			48	24	12	GF1610E7
			110	48	12	GF1610F7
			220	—	12	GF1610M7
			230/240	110	12	GF1610U7
	2	—	12	6	12	GF1620J7
			24	12	12	GF1620B7
			48	24	12	GF1620E7
			110	48	12	GF1620F7
			220	—	12	GF1620M7
			230/240	110	12	GF1620U7
	1	1	12	6	12	GF1611J7
			24	12	12	GF1611B7
			48	24	12	GF1611E7
			110	48	12	GF1611F7
			220	—	12	GF1611M7
			230/240	110	12	GF1611U7



Contactors



TeSys

TeSys GC, GY contactors - Accessories

Product references



Instantaneous auxiliary contact blocks				
Number of contacts	Number of poles			Reference
2				
	1	1	–	GAC0521
	–	2	–	GAC0531
	–	–	1	GAC0511

Accessories					
Description	For use on contactor	Number of modules	Operational voltage in V	Sold in lots of	Unit reference
Coil suppression blocks comprising 2 RC circuits	–	1	12...48	1	GAP21
			110...240	1	GAP23
Ventilation 1/2 module clips onto rail	–	1/2	–	10	GAC5
Set of screw shields (10 top parts + 10 bottom parts)	40 or 63 A 2 contacts	2	–	1	A9A15922
	40 or 63 A 3 or 4 contacts	3	–	1	A9A15923



# Technical Data for Designers

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- > dimensions.....B8/90

### TeSys K:

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Standard IEC tests - Contactors  
conforming to UL/CSA.....B8/124



Contactors

B8/58

Life | s On

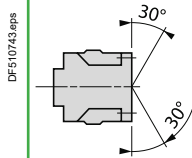
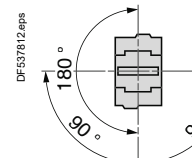
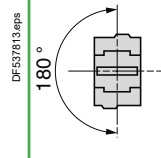
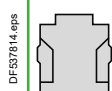
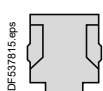
**Schneider**  
Electric



# TeSys

## TeSys D Green, TeSys D Contactors

### Characteristics

Environment							
Contactor type LC1			D09...D18 DT20 and DT25	D25...D38 DT32 and DT40	D40A...D80A DT60A and DT80A	D80...D95 <sup>(1)</sup>	D115 and D150
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1, overvoltage category III, degree of pollution: 3	V	690				1000
	Conforming to UL, CSA	V	600				
Rated impulse withstand voltage (Uimp)	Conforming to IEC 60947	kV	6				8
Conforming to standards			IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4				
Product certifications <sup>(1)</sup>			UL, CSA, CCC, EAC, CB certification, EU-MR-RO by DNV-GL				UL, CSA, CCC, EAC, CB certification, DNV-GL, RINA, BV, LRoS
Degree of protection <sup>(2)</sup> (front face)	Conforming to IEC 60529						
	Power circuit connections		Protection against direct finger contact IP20				
	Coil connection		Protection against direct finger contact IP20				
Climatic withstand			According to IACS E10 and IEC 60947-1 Annex Q category D				According to IACS E10
Ambient air temperature around the device	Storage	°C	-60...+80				
	Operation <sup>(3)</sup>	°C	-40...+60				
	Allowed with derating <sup>(3) (4)</sup>	°C	+60...+70 at Uc to 1.●● x Uc				
Maximum operating altitude	Without derating	m	3000				
Operating positions <sup>(5)</sup>	Without derating in the following positions		AC and DC coils AC/DC and "BBE" coils  		AC coils AC/DC and "BBE" coils  		DC coils  
	Positions that are not allowed		For ≡ contactors LC1D09 to LC1D150.   				
Flame resistance	Conforming to IEC 60695-2-11	°C	850				
Shock resistance <sup>(6)</sup> 1/2 sine wave = 11 ms	Contactor open		10 gn	8 gn	10 gn	8 gn	6 gn
	Contactor closed		15 gn	15 gn	15 gn	10 gn	15 gn
Vibration resistance <sup>(6)</sup> 5...300 Hz	Contactor open		2 gn				
	Contactor closed		4 gn	4 gn	4 gn	3 gn	4 gn

<sup>(1)</sup> Contactor **LC1D95** with d.c. coil is not UL/CSA certified.

<sup>(2)</sup> Protection provided for the cabling c.s.a.'s indicated on the next page and for connection by cable. For lug type: add a protective cover.

<sup>(3)</sup> As per IEC60947-4-1, operating time and drop out voltage given and tested for -5...+40 °C.

<sup>(4)</sup> Refer to operational current in AC1 (page A6/40).

<sup>(5)</sup> When mounting on a vertical rail, use a stop.

<sup>(6)</sup> Without modifying the power contact states, in the most unfavourable direction (coil energised at U<sub>e</sub>).  
In case of vibration, it is recommended to mount the devices separately by screws on metal plate.



# TeSys

## TeSys D Green, TeSys D Contactors

### Characteristics

Pole characteristics TeSys D, TeSys D Green												
Contactor type			LC1		D09 (3P)	DT20 D098	D12 (3P)	DT25 D128	D18 (3P)	DT32 D188	D25 (3P)	DT40 D258
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-3, θ ≤ 60 °C		A	9		12		18		25		
	In AC-1, θ ≤ 60 °C		A	25 <sup>(1)</sup>	20	25 <sup>(1)</sup>	25	32 <sup>(1)</sup>	32	40 <sup>(1)</sup>	40	
Rated operational voltage (Ue)	Up to		V	690		690		690		690		
Frequency limits	Of the operational current		Hz	25...400		25...400		25...400		25...400		
Conventional thermal current (Ith)	θ ≤ 60 °C		A	25 <sup>(1)</sup>	20	25 <sup>(1)</sup>	25	32 <sup>(1)</sup>	32	40 <sup>(1)</sup>	40	
Rated making capacity (440 V)	Conforming to IEC 60947		A	250		250		300		450		
Rated breaking capacity (440 V)	Conforming to IEC 60947		A	250		250		300		450		
Permissible short time rating No current flowing for preceding 15 minutes with θ ≤ 40 °C	For 1 s		A	210		210		240		380		
	For 10 s		A	105		105		145		240		
	For 1 min		A	61		61		84		120		
	For 10 min		A	30		30		40		50		
Fuse protection against short-circuits (U ≤ 690 V)	Without thermal overload relay, gG fuse	type 1	A	25		40		50		63		
		type 2	A	20		25		35		40		
		With thermal overload relay		A	See pages B11/4 and B11/5, for aM or gG fuse ratings corresponding to the associated thermal overload relay							
Average impedance per pole	At Ith and 50 Hz		mΩ	2.5		2.5		2.5		2		
Power dissipation per pole for the above operational currents	AC-3		W	0.20		0.36		0.8		1.25		
	AC-1		W	1.56		1.56		2.5		3.2		

Control circuit characteristics, a.c. supply TeSys D														
Rated control circuit voltage (Uc)		50/60 Hz		V	12...690									
Control voltage limits														
	50 or 60 Hz coils	Operation			–									
		Drop-out			–									
	50/60 Hz coils	Operation			0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 60 °C									
		Drop-out			0.3...0.6 Uc at 60 °C									
Average consumption at 20 °C and at Uc	∼ 50 Hz	Inrush	50 Hz coil	VA	–									
			Cos φ		0.75									
			50/60 Hz coil	VA	70									
		Sealed	50 Hz coil	VA	–									
			Cos φ		0.3									
			50/60 Hz coil	VA	7									
	∼ 60 Hz	Inrush	60 Hz coil	VA	–									
			Cos φ		0.75									
			50/60 Hz coil	VA	70									
		Sealed	60 Hz coil	VA	–									
			Cos φ		0.3									
			50/60 Hz coil	VA	7.5									
			Heat dissipation		50/60 Hz	W	2...3							
			Operating time <sup>(2)</sup>		Closing "C"	ms	12...22							
Opening "O"	ms	4...19												
Mechanical durability in millions of operating cycles		50 or 60 Hz coil			–									
		50/60 Hz coil on 50 Hz			15									
Maximum operating rate at ambient temperature ≤ 60 °C		In operating cycles per hour			3600									

### Control circuit characteristics, a.c. supply TeSys D

Rated control circuit voltage (Uc)		50/60 Hz		V	12...690	
Control voltage limits						
50 or 60 Hz coils	Operation			–		
	Drop-out			–		
50/60 Hz coils	Operation			0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 60 °C		
	Drop-out			0.3...0.6 Uc at 60 °C		
Average consumption at 20 °C and at Uc	~ 50 Hz	Inrush	50 Hz coil	VA	–	
			Cos φ		0.75	
			50/60 Hz coil	VA	70	
		Sealed	50 Hz coil	VA	–	
			Cos φ		0.3	
			50/60 Hz coil	VA	7	
	~ 60 Hz	Inrush	60 Hz coil	VA	–	
			Cos φ		0.75	
			50/60 Hz coil	VA	70	
			Sealed	60 Hz coil	VA	–
				Cos φ		0.3
				50/60 Hz coil	VA	7.5
Heat dissipation	50/60 Hz		W	2...3		
Operating time <sup>(2)</sup>		Closing "C"		ms	12...22	
		Opening "O"		ms	4...19	
Mechanical durability in millions of operating cycles		50 or 60 Hz coil			–	
		50/60 Hz coil on 50 Hz			15	
Maximum operating rate at ambient temperature ≤ 60 °C		In operating cycles per hour			3600	

<sup>(1)</sup> Versions with spring terminal connections:

16 A for LC1D093 and LC1D123 (20 A possible with 2 x 2.5 mm<sup>2</sup> in parallel),

25 A for LC1D183 to LC1D323 (32 A possible for LC1D183 connected with 2 x 4 mm<sup>2</sup> cables in parallel; 40 A possible for LC1D253 and LC1D323 connected with 2 x 4 mm<sup>2</sup> in parallel).

<sup>(2)</sup> The closing time "C" is measured from the moment the coil supply is switched on to closure of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.



D32	D38	D40A	DT60A	D50A	D65A	D80A	DT80A	D80	D95	D115	D150
32	38	40	—	50	65	66	—	80	95	115	150
50 <sup>(1)</sup>	50	60	60	80	80	80	80	125	125	200	200
690	690	690	690	690	690	690	690	1000	1000	1000	1000
25...400	25...400	25...400	25...400	25...400	25...400	25...400	25...400	25...400	25...400	25...400	25...400
50	50	60	60	80	80	80	80	125	125	200	200
550	550	800	800	900	1000	1000	1000	1100	1100	1260	1660
550	550	800	800	900	1000	1000	1000	1100	1100	1100	1400
430	430	720	720	810	900	900	900	990	1100	1100	1400
260	310	320	320	400	640	640	640	640	800	950	1200
138	150	165	165	208	260	260	260	320	400	550	580
60	60	72	72	84	110	110	110	135	135	250	250
63	63	80	80	100	125	125	125	200	200	250	315
63	63	80	80	100	125	125	125	160	160	200	250

See pages B11/4 and B11/5 for aM or gG fuse ratings corresponding to the associated thermal overload relay

2	2	1.5	1.6	1.5	1.5	1.5	1.6	0.8	0.8	0.6	0.6
2	3	2.4	—	3.7	6.3	6.3	—	5.1	7.2	7.9	13.5
5	5	5.4	5.8	9.6	9.6	9.6	10.2	12.5	12.5	24	24

12...690	12...690							24...500			
—	—							0.85...1.1 Uc at 55 °C			
—	—							0.3...0.6 Uc at 55 °C		0.3...0.5 Uc at 55 °C	
0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 60 °C	0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 60 °C							0.8...1.1 Uc on 50 Hz and 0.85...1.1 Uc on 60 Hz at 55 °C		0.8...1.15 Uc on 50/60 Hz at 55 °C	
0.3...0.6 Uc at 60 °C	0.3...0.6 Uc at 60 °C							0.3...0.6 Uc at 55 °C		0.3...0.5 Uc at 55 °C	
—	—							200		300	—
0.75	0.75							0.75		0.8	0.9
70	160							245		280...350	280...350
—	—							20		22	—
0.3	0.3							0.3		0.3	0.9
7	15							26		2...18	2...18
—	—							220		300	—
0.75	0.75							0.75		0.8	0.9
70	140							245		280...350	280...350
—	—							22		22	—
0.3	0.3							0.3		0.3	0.9
7.5	13							26		2...18	2...18
2...3	4...5							6...10		3...8	3...4.5
12...22	12...26	12...26	12...26	12...26	12...26	12...26	12...26	20...35	20...35	20...50	20...35
4...19	4...19	4...19	4...19	4...19	4...19	4...19	4...19	6...20	6...20	6...20	40...75
—	—	—	—	—	—	—	—	10	10	8	—
15	6	6	6	6	6	6	6	4	4	8	8
3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	2400	1200

Ref.



Contactors



# TeSys

## TeSys D Contactors

### Characteristics

d.c. control circuit characteristics TeSys D							
Contactor type				LC1D09...D38 LC1DT20...DT40	LC1D40A...D80A LC1DT60A and DT80A	LC1 or LP1D80 LC1D95	LC1D115 and LC1D150
Rated control circuit voltage (Uc) ---			V	12...440	12...440		24...440
Rated insulation voltage	Conforming to IEC 60947-1		V	690			
	Conforming to UL, CSA		V	600			
Control voltage limits	Operation	Standard coil		0.7...1.25 Uc at 60 °C	0.75...1.25 Uc at 60 °C	0.85...1.1 Uc at 55 °C	0.75...1.2 Uc at 55 °C
		Wide range coil		–	–	0.75...1.2 Uc at 55 °C	–
	Drop-out			0.1...0.25 Uc at 60 °C	0.1...0.3 Uc at 60 °C	0.1...0.3 Uc at 55 °C	0.15...0.4 Uc at 55 °C
Average consumption at 20 °C and at Uc	---	Inrush	W	5.4	19	22	270...365
		Sealed	W	5.4	7.4	22	2.4...5.1
Operating time <sup>(1)</sup> average at Uc	Closing	"C"	ms	63 ±15 %	50 ±15%	95...130	20...35
	Opening	"O"	ms	20 ±20 %	20 ±20%	20...35	40...75
<i>Note: The arcing time depends on the circuit switched by the poles. For all normal 3-phase applications, the arcing time is less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.</i>							
Time constant (L/R)			ms	28	34	75	25
Mechanical durability at Uc	In millions of operating cycles			30	10	10	8
Maximum operating rate at ambient temperature ≤ 60 °C	In operating cycles per hour			3600	3600	3600	1200
Low consumption control circuit characteristics TeSys D							
Rated insulation voltage	Conforming to IEC 60947-1		V	690	–		
	Conforming to UL, CSA		V	600	–		
Maximum voltage	Of the control circuit on ---		V	250	–		
Average consumption d.c. at 20 °C and at Uc	Wide range coil (0.8...1.25 Uc)	Inrush	W	2.4	–		
		Sealed	W	2.4	–		
Operating time <sup>(1)</sup> at Uc and at 20 °C	Closing	"C"	ms	77 ±15 %	–		
	Opening	"O"	ms	25 ±20 %	–		
Voltage limits (θ ≤ 60 °C) of the control circuit	Operation			0.8 to 1.25 Uc	–		
	Drop-out			0.1...0.3 Uc	–		
Time constant (L/R)			ms	40	–		
Mechanical durability	In millions of operating cycles			30	–		
Maximum operating rate at ambient temperature ≤ 60 °C	In operating cycles per hour			3600	–		

<sup>(1)</sup> The operating times depend on the type of contactor electromagnet and its control mode.  
The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles.  
The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.



# TeSys

## TeSys D Green Contactors

### Characteristics

Wide band TeSys D Green AC/DC coil circuit characteristics										
Rated control circuit voltage (Uc)			V	AC/DC 24...250						
	Operation	V	0.85 Uc mini...1.1 Uc maxi at 60 °C in AC or DC (BNE coil: 0.8 Uc mini at 24 VDC, 0.85 Uc mini in AC).							
	Drop-out	V	0.1 Uc maxi (e.g. 100 to 250 V = 25 V at 60 °C)							
Contactor type			LC1D09...D38			LC1D40A...D80A, LC1DT60A, LC1DT80A				
Coil code			BNE	EHE	KUE	BBE	BNE	EHE	KUE	
Rated control circuit voltage (Uc)				24-60	48-130	100-250	24 DC	24-60	48-130	100-250
AC supply at 20°C	Consumption inrush	VA	15	25	25	-	15	23	18	
	Consumption sealed	VA	0.9	1.3	1.6	-	1	1.4	1.8	
	Consumption sealed	mA	28	15	9	-	35	17	9.5	
	Heat dissipation	W	0.6	0.8	1.1	-	0.8	0.9	1.3	
DC supply at 20°C	Consumption inrush	W	14	24	18	11	16	19	14	
	Consumption sealed	mA	23	13	7	20	30	15	7.7	
	Heat dissipation	W	0.6	0.8	1.1	0.5	0.7	0.9	1.2	
Max operating time <sup>(2)</sup>	Closing "C"	ms	50 ±5 ms			60 ±5 ms				
	Opening "O"	ms	20...90 ms			20...80 ms				
EMC immunity			Meets IEC 60947-4-1 standard, table 14							
EMC emission			IEC 60947-4-1 §9.4.3	Environment A <sup>(1)</sup>						
Maximum operating rate at ambient temperature ≤ 60°C			cycle/h	3600						
Mechanical durability at Uc In millions of operating cycles				15			6			

<sup>(1)</sup> Use of this product in EMC environment B may require mitigation measures to avoid unwanted disturbance.

<sup>(2)</sup> The closing time "C" is measured from the moment the coil supply is switched on to closure of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separates.

Ref.



Contactors



# TeSys

## TeSys D Green, TeSys D Contactors

### Characteristics

#### Power circuit connections

##### Screw clamp terminal connections TeSys D, TeSys D Green

Contactor type		LC1	D09 and D12 DT20 and DT25	D18 (3P)	D25 (3P)	D32	D38	D18 and D25 (4P) DT32 and DT40	D40A to D80A DT60A and DT80A <sup>(1)</sup>	D80 and D95	D115 and D150
Tightening			Screw clamp terminals					Connector 2 inputs	Screw clamp terminals	Connector 1 input	Connector 2 inputs
Flexible cable without cable end	1 conductor	mm <sup>2</sup>	1...4	1.5...6	2.5...10			2.5...10	1...35	4...50	10...120
	2 conductors	mm <sup>2</sup>	1...4	1.5...6	2.5...10			2.5...10	1...25 and 1...35	4...25	10...120 + 10...50
Flexible cable with cable end	1 conductor	mm <sup>2</sup>	1...4	1...6	1...10			2.5...10	1...35	4...50	10...120
	2 conductors	mm <sup>2</sup>	1...2.5	1...4	1.5...6			2.5...10	1...25 and 1...35	4...16	10...120 + 10...50
Solid cable without cable end	1 conductor	mm <sup>2</sup>	1...4	1.5...6	1.5...10			2.5...16	1...35	4...50	10...120
	2 conductors	mm <sup>2</sup>	1...4	1.5...6	2.5...10			2.5...16	1...25 and 1...35	6...25	10...120 + 10...50
Screwdriver	Philips		N° 2	N° 2	N° 2			N° 2	—	—	—
	Flat screwdriver Ø		Ø6	Ø6	Ø6			Ø6	—	Ø6...Ø8	—
Hexagonal key			—	—	—			—	4	4	4
Tightening torque		N.m	1.7	1.7	2.5			1.8	5: ≤ 25 mm <sup>2</sup> 8: 35 mm <sup>2</sup>	12	12

##### Spring terminal connections <sup>(2)</sup> TeSys D

Flexible cable without cable end	1 conductor	mm <sup>2</sup>	2.5 (4: DT25)	4	4	4	—	10	—	—
	2 conductors	mm <sup>2</sup>	2.5 (except DT25)	4	4	4	—	—	—	—

##### Connection by bars or lugs TeSys D

Bar c.s.a.			—	—	—	—	—	—	3 x 16	5 x 25
Lug external Ø		mm	8	8	10	10	8	16.5	17	25
Ø of screw		mm	M3.5	M3.5	M4	M4	M3.5	M6	M6	M8
Screwdriver	Pozidriv		N° 2	N° 2	N° 2	N° 2	N° 2	—	—	—
	Flat screwdriver Ø		Ø6	Ø6	Ø6	Ø6	Ø6	—	Ø8	—
Key for hexagonal headed screw			—	—	—	—	—	10	10	13
Tightening torque		N.m	1.7	1.7	2.5	2.5	1.8	6	9	12

#### Control circuit connections

##### Connection by cable (tightening via screw clamps) TeSys D, TeSys D Green

Flexible cable without cable end	1 conductor	mm <sup>2</sup>	1...4	1...4	1...4	1...4	1...4	1...4	1...4	1...2.5
	2 conductors	mm <sup>2</sup>	1...4	1...4	1...4	1...4	1...4	1...4	1...4	1...2.5
Flexible cable with cable end	1 conductor	mm <sup>2</sup>	1...4	1...4	1...4	1...4	1...4	1...4	1...2.5	1...2.5
	2 conductors	mm <sup>2</sup>	1...2.5	1...2.5	1...2.5	1...2.5	1...2.5	1...2.5	1...2.5	1...2.5
Solid cable without cable end	1 conductor	mm <sup>2</sup>	1...4	1...4	1...4	1...4	1...4	1...4	1...4	1...2.5
	2 conductors	mm <sup>2</sup>	1...4	1...4	1...4	1...4	1...4	1...4	1...4	1...2.5
Screwdriver	Philips		N° 2	N° 2	N° 2	N° 2	N° 2	N° 2	N° 2	N° 2
	Flat screwdriver Ø		Ø6	Ø6	Ø6	Ø6	Ø6	Ø6	Ø6	Ø6
Tightening torque		N.m	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.2

##### Spring terminal connections <sup>(2)</sup> TeSys D

Flexible cable without cable end	1 conductor	mm <sup>2</sup>	2.5	2.5	2.5	2.5	—	2.5	0.75...2.5	—
	2 conductors	mm <sup>2</sup>	2.5	2.5	2.5	2.5	—	2.5	0.75...2.5	—

##### Connection by bars or lugs TeSys D

Lug external Ø		mm	8	8	8	8	8	8	8	8
Ø of screw		mm	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
Screwdriver	Pozidriv (except for D80-95 / D115-150: Philips)		N° 2	N° 2	N° 2	N° 2	N° 2	N° 2	N° 2	N° 2
	Flat screwdriver Ø		Ø6	Ø6	Ø6	Ø6	Ø6	Ø6	Ø6	Ø6
Tightening torque		N.m	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.2

<sup>(1)</sup> BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).

<sup>(2)</sup> If cable ends are used, choose the next size down (example: for 2.5 mm<sup>2</sup>, use 1.5 mm<sup>2</sup>) and square crimp the cable ends using a special tool.

References:  
pages B8/4 to B8/14

Dimensions:  
pages B8/72 to B8/78

Schemes:  
pages B8/79 and B8/80

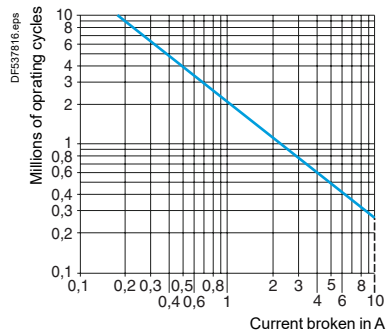


# TeSys

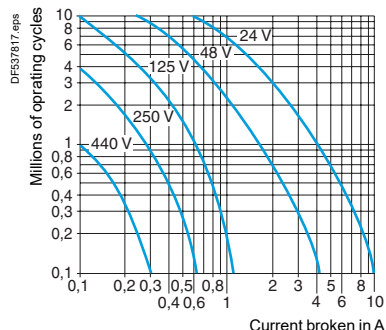
## TeSys D Green, TeSys D Contactors

### Characteristics

Characteristics of auxiliary contacts incorporated in the contactor				
Mechanically linked contacts	Conforming to IEC 60947-5-1		Each contactor has 2 N/O and N/C contacts mechanically linked on the same movable contact holder	
Mirror contact	Conforming to IEC 60947-4-1		The N/C contact on each contactor represents the state of the power contacts and can be connected to a PREVENTA safety module	
Rated operational voltage (Ue)	Up to	V	690	
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	690	
	Conforming to UL, CSA	V	600	
Conventional thermal current (Ith)	For ambient temperature ≤ 60 °C	A	10	
Frequency of the operational current		Hz	25...400	
Minimum switching capacity λ = 10 <sup>-8</sup>	U min	V	17	
	I min	mA	5	
Short-circuit protection	Conforming to IEC 60947-5-1		gG fuse: 10 A	
Rated making capacity	Conforming to IEC 60947-5-1, I rms	A	~: 140, ---: 250	
Short-time rating	Permissible for	1 s	A	100
		500 ms	A	120
		100 ms	A	140
Insulation resistance		MΩ	> 10	
Non-overlap time	Guaranteed between N/C and N/O contacts	ms	1.5 (on energisation and on de-energisation)	
Tightening torque	Pozidriv / Philips head n° 2 and Ø6	N.m	1.7	



AC-15



DC-13

#### Operational power of contacts conforming to IEC 60947-5-1

##### a.c. supply, categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current ( $\cos \phi 0.7$ ) = 10 times the power broken ( $\cos \phi 0.4$ ).

Operating cycles	V	24	48	115	230	400	440	600
1 million	VA	60	120	280	560	960	1050	1440
3 million	VA	16	32	80	160	280	300	420
10 million	VA	4	8	20	40	70	80	100

##### d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

Operating cycles	V	24	48	125	250	440
1 million	W	96	76	76	76	44
3 million	W	48	38	38	32	—
10 million	W	14	12	12	—	—



Environment						
Contact block type (not dust/damp protected)			LADN or LAD C	LADT and LADS	LADR	LAD8
Conforming to standards			IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5			
Product certifications			UL, CSA, CCC, EAC, CB certification			
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 2X			
Ambient air temperature around the device	Storage	°C	-60...+80			
	Operation	°C	-5...+60			
Maximum operating altitude	Without derating	m	3000			
Connection by cable	Phillips n° 2 and Ø6 mm Flexible or solid cable with or without cable end		mm²	Min: 1 x 1; max: 2 x 2.5		
Tightening torque		N.m	1.7			
Spring terminal connections	Flexible or solid cable without cable end		mm²	Max: 2 x 2.5		
Instantaneous and time delay contact characteristics						
Number of contacts			1, 2 or 4	2	2	2
Rated operational voltage (Ue)	Up to	V	690			
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1	V	690			
	Conforming to UL, CSA	V	600			
Conventional thermal current (Ith)	For ambient temperature ≤ 60 °C		A	10		
Frequency of the operational current		Hz	25...400			
Minimum switching capacity	U min	V	17			
	I min	mA	5			
Short-circuit protection	Conforming to IEC 60947-5-1 gG fuse		A	10		
Rated making capacity	Conforming to IEC 60947-5-1	I rms	A	~: 140; ∴: 250		
Short-time rating	Permissible for	1 s	A	100		
		500 ms	A	120		
		100 ms	A	140		
Insulation resistance		MΩ	> 10			
Non-overlap time	Guaranteed between N/C and N/O contacts		ms	1.5 (on energisation and on de-energisation)		
Overlap time	Guaranteed between N/C and N/O contacts on LADC22		ms	1.5	–	–
Time delay (LADT, R and S contact blocks) Accuracy only valid for setting range indicated on the front face	Ambient air temperature for operation		°C	–	-40...+70	-40...+70
	Repeat accuracy			–	±2 %	±2 %
	Drift up to 0.5 million operating cycles			–	+15 %	+15 %
	Drift depending on ambient air temperature			–	0.25 % per °C	0.25 % per °C
Mechanical durability	In millions of operating cycles			30	5	5
Operational power of contacts			See page B8/68			



Environment						
Contact block type (dust/damp protected)			LA1DX	LA1DZ (4 contacts: 2 protected + 2 non protected)		LA1DY
			Protected	Protected	Non protected	Protected
Conforming to standards			IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5			
Product certifications			UL, CSA, CCC, EAC, CB certification			
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 2X			
Ambient air temperature	Storage and operation	°C	-25...+70			
Cabling	Phillips n° 2 and Ø6 mm Flexible or solid conductor with or without cable end	mm²	Min: 1 x 1; max: 2 x 2.5			
Tightening torque		N.m	1.7			
Number of contacts			2	2	2	2
Contact characteristics						
Rated operational voltage (Ue)	Up to	Vac	125	125	690	125
		Vdc	30	30		30
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1	V	250	250	690	250
	Conforming to UL, CSA	V	—	—	600	—
Conventional thermal current (Ith)	For ambient temperature ≤ 40 °C	A	—	—	10	—
Maximum operational current (Ie)		mA	100	100	—	100
Frequency of the operational current		Hz	—	—	25...400	—
Minimum switching capacity	U min	V	5	5	17	5
	I min	mA	1	1	5	1
Short-circuit protection	Conforming to IEC 60947-5-1 gG fuse	A	—	—	10	—
Rated making capacity	Conforming to IEC 60947-5-1	I rms	A	—	~:140; ---: 250	—
Short-time rating	Permissible for	1 s	A	—	100	—
		500 ms	A	—	120	—
		100 ms	A	—	140	—
Insulation resistance		MΩ	> 10	> 10	> 10	> 10
Mechanical durability	In millions of operating cycles		5	5	30	5
Materials and technology used for dust and damp protected contacts			Gold alloy - Single break	Gold alloy - Single break	—	Gold alloy - Single break with crossed bars

Ref.



Contactors

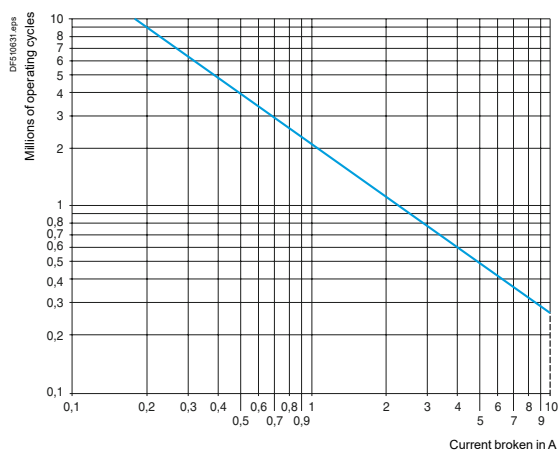


## Rated operational power of not dust/damp protected contacts (conforming to IEC 60947-5-1)

### a.c. supply, categories AC-14 and AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current ( $\cos \varphi 0.7$ ) = 10 times the power broken ( $\cos \varphi 0.4$ ).

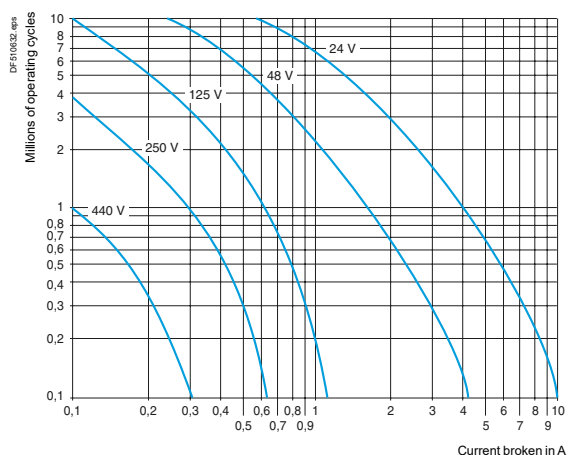
Operating cycles	V	24	48	115	230	400	440	600
1 million	VA	60	120	280	560	960	1050	1440
3 million	VA	16	32	80	160	280	300	420
10 million	VA	4	8	20	40	70	80	100



### d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

Operating cycles	V	24	48	125	250	440
1 million	W	96	76	76	76	44
3 million	W	48	38	38	32	—
10 million	W	14	12	12	—	—



Ref.



Contactors



## Characteristics

Environment			
Conforming to standards			IEC/EN 60947-5-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5
Product certifications			UL, CSA
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 2X
Ambient air temperature around the device	Storage	°C	-40...+80
	Operation	°C	-25...+55
	Permissible for operation at Uc	°C	-25...+70

Suppressor modules TeSys D						
Module type			LA4DA, LAD4RC, LAD4RC3	LA4DB, LAD4T, LAD4T3	LA4DC, LAD4D3	LA4DE, LAD4V, LAD4V3
Type of protection			RC circuit	Bidirectional peak limiting diode	Diode	Varistor
Rated control circuit voltage (Uc)		V	~ 24...415	~ or ~ 24...440	~ 12...250	~ or ~ 24...250
Maximum peak voltage			3 Uc	2 Uc	Uc	2 Uc
Natural RC frequency	24/48 V	Hz	400	—	—	—
	50/127 V	Hz	200	—	—	—
	110/240 V	Hz	100	—	—	—
	380/415 V	Hz	150	—	—	—

Mechanical latch blocks <sup>(1)</sup> TeSys D, TeSys D Green					
Mechanical latch block type			LAD6K10	LA6DK20	
For use on contactor			LC1D09...D80A DT20...DT80A	LC1D80...D150 LP1D80 and LC1D115	
Product certifications			UL, CSA	UL, CSA	
Rated insulation voltage	Conforming to IEC 60947-5-1	V	690	690	
Rated control circuit voltage	~ 50/60 Hz and ~	V	24...415	24...415	
Power required	For unlatching	~	25	25	
		~	30	30	
Maximum operating rate	In operating cycles/hour		1200	1200	
On-load factor			10 %	10 %	
Mechanical durability at Uc	In millions of operating cycles		0.5	0.5	

<sup>(1)</sup> Unlatching can be manually operated or electrically controlled (pulsed).

The LA6DK or LAD6K latch coil and the LC1D operating coil must not be energised simultaneously.

The duration of the LA6DK or LAD6K and LC1D control signals must be ≥ 100 ms.

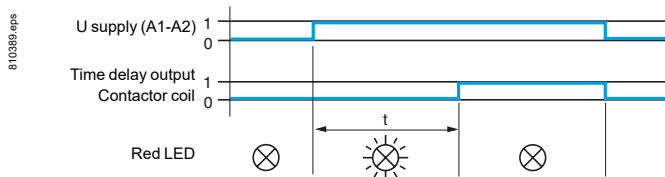
Ref.



Contactors



Environment TeSys D, TeSys D Green			
Module type		LA4DT (On-delay)	
Conforming to standards			IEC 60255-5
Product certifications			UL, CSA
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 2X
Ambient air temperature around the device	Storage	°C	-40...+80
	Operation	°C	-25...+55
	For operation at Uc	°C	-25...+70
Rated insulation voltage (Ui)	Conforming to IEC 60947-1	V	250
Cabling	Phillips n° 2 and Ø6 mm Flexible or solid conductor with or without cable end	mm²	Min: 1 x 1; max: 2 x 2.5
Tightening torque		N.m	1.7
Control circuit characteristics			
Built-in protection	Of the input		By varistor
	Contact coil suppression		By varistor
Rated control circuit voltage (Uc)		V	~ or ≡: 24...250
Permissible variation			0.8...1.1 Uc
Type of control			By mechanical contact only
Timing characteristics			
Timing ranges		s	0.1...2; 1.5...30; 25...500
Repeat accuracy	0...40 °C		±3 % (10 ms minimum)
Reset time	During time delay period	ms	150
	After time delay period	ms	50
Immunity to microbreaks	During time delay period	ms	10
	After time delay period	ms	2
Minimum control pulse duration		ms	–
Time delay signalling	By LED		Illuminates during time delay period
Switching characteristics (solid state type)			
Maximum power dissipated		W	2
Leakage current		mA	< 5
Residual voltage		V	3.3
Overvoltage protection			3 kV; 0.5 joule
Electrical durability	In millions of operating cycles		30
Function diagram			
Electronic on-delay timer LA4DT			





Environment TeSys D, TeSys D Green									
Conforming to standards				IEC 60255-5					
Product certifications				UL, CSA					
Degree of protection	Conforming to IEC 60529			Protection against direct finger contact IP 2X					
Ambient air temperature around the device	Storage	°C	-40...+80						
	Operation	°C	-25...+55						
	Permissible for operation at U <sub>c</sub>	°C	-25...+70						
Other characteristics									
Module type			LA4DFB for TeSys D With relay		LA4DWB for TeSys D, TeSys D Green Solid state				
Conventional thermal current (I <sub>th</sub> )	For ambient temperature ≤ 50 °C	A	8						
Rated insulation voltage	Conforming to IEC 60947-5-1	V	250						
Rated operational voltage	Conforming to IEC 60947-5-1	V	250						
Indication of input state			By integral LED which illuminates when the contactor coil is energised						
Input signals	Control voltage (E1-E2)	V	--- 24		--- 24				
	Permissible variation	V	17...30		5...30				
	Current consumption at 20 °C	mA	25		8.5 for 5 V 15 for 24 V				
	State “0” guaranteed for U	V	< 2.4		< 2.4				
	I	mA	< 2		< 2				
	State “1” guaranteed for U	V	17		5				
Built-in protection	Against reversed polarity		By diode		By diode				
	Of the input		By diode		By diode				
Electrical durability at 220 A/240 V	In millions of operating cycles		10		20				
Maximum immunity to microbreaks		ms	4		1				
Power dissipated	At 20 °C	W	0.6		0.4				
Direct mounting on contactor	With coil	~ 24...250 V	LC1D80...D150		–				
		~ 100...250 V	–		LC1D80...D115				
		~ 380...415 V	–		–				
Mounting with cabling adapter LAD4BB	With coil	~ 24...250 V	LC1D09...D38, LC1DT20...DT40		LC1D09...D38, LC1DT20...DT40				
		~ 380...415 V	–		–				
Mounting with cabling adapter LAD4BB3	With coil	~ 24...250 V	LC1D40A...D80A		LC1D40A...D80A				
		~ 380...415 V	LC1D40A...D80A		LC1D40A...D80A				
Total operating time at U <sub>c</sub> (of the contactor)		The operating times depend on the type of contactor electromagnet and its control mode. The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.							
			LC1D09...D38, LC1DT20...DT40	LC1D40A...D80A	LC1D80 and D95	LC1D115	LC1D150		
		With LA4DFB	"C"	ms	20...30	28...34	28...43	28...58	28...43
			"O"	ms	16...24	20...24	18...32	18...32	52...87
Cabling	Phillips n° 2 and Ø6 mm Flexible or solid cable with or without cable end	mm²	Min: 1 x 1; max: 2 x 2.5						
Tightening torque		N.m	1.7						

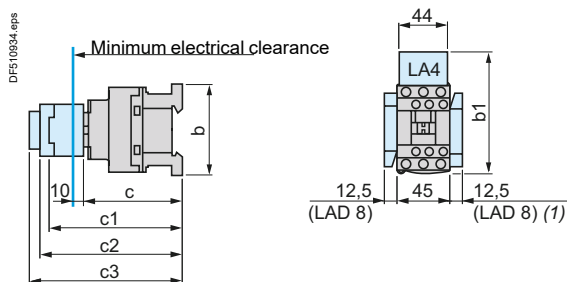


# TeSys

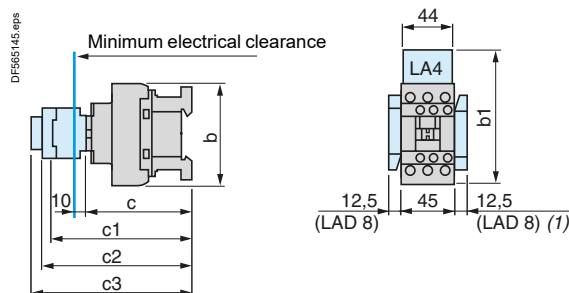
## TeSys D Contactors - a.c. coil

### Dimensions

#### LC1D09...D18 (3-pole)



#### LC1D25...D38 (3-pole), LC1DT20...DT40 (4-pole)

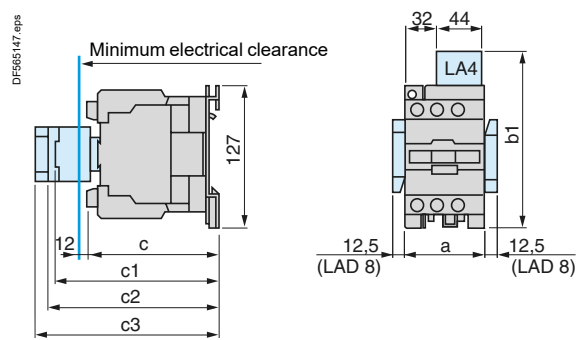
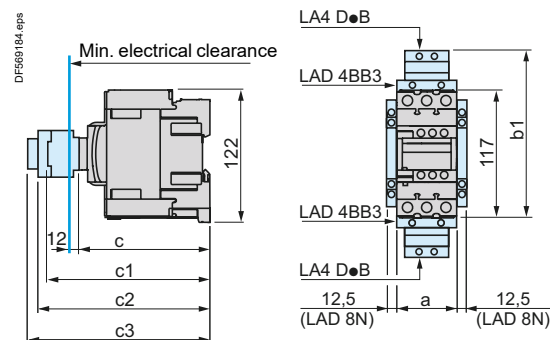


LC1	D09...D18	D093... D123	D099... D129	D25... D38	D183... D323	D098, D128, DT20 and DT25	DT203 and DT253	DT32 and DT40	D188, D258, DT323 and DT403
b without add-on blocks	77	99	80	85	99	85	99	91	105
b1 with LAD4BB	94	107	95,5	98	107	98	—	—	—
with LA4D●2	110 <sup>(1)</sup>	123 <sup>(1)</sup>	111,5 <sup>(1)</sup>	114 <sup>(1)</sup>	123 <sup>(1)</sup>	114	—	—	—
with LA4DF, DT	119 <sup>(1)</sup>	132 <sup>(1)</sup>	120,5 <sup>(1)</sup>	123 <sup>(1)</sup>	132 <sup>(1)</sup>	129	—	—	—
with LA4DW, DL	126 <sup>(1)</sup>	139 <sup>(1)</sup>	127,5 <sup>(1)</sup>	130 <sup>(1)</sup>	139 <sup>(1)</sup>	190	—	—	—
c without cover or add-on blocks	84	84	84	90	90	90	90	97	97
with cover, without add-on blocks	86	86	86	92	92	92	92	99	99
c1 with LADN or C (2 or 4 contacts)	117	117	117	123	123	123	123	131	131
c2 with LA6DK10, LAD6K10	129	129	129	135	135	135	135	143	143
c3 with LADT, R, S	137	137	137	143	143	143	143	151	151
with LADT, R, S and sealing cover	141	141	141	147	147	147	147	155	155

<sup>(1)</sup> Including LAD4BB.

#### LC1D40A...D80A (3-pole), LC1DT60A...DT80A (4-pole)

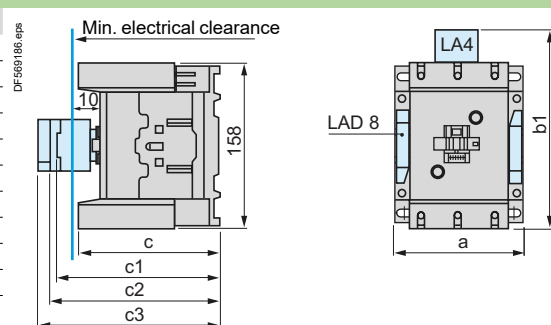
#### LC1D80 and D95 (3-pole), LC1D80004 and D80008 (4-pole), D40008 and D65008 (4-pole)



LC1	D40A...D80A	DT60A...DT80A	D40008	D80	D95, D65008	D80004	D80008
a	55	70	85	85	85	96	96
b1 with LA4D●2	—	—	135	135	135	135	135
with LA4DB3 or LAD4BB3	136	—	—	135	—	—	—
with LA4DF, DT	157	—	142	142	142	142	142
with LA4DM, DW, DL	166	—	150	150	150	150	150
c without cover or add-on blocks	118	118	125	125	125	125	140
with cover, without add-on blocks	120	120	—	130	130	—	—
c1 with LADN (1 contact)	—	—	139	150	150	150	150
with LADN or C (2 or 4 contacts)	150	150	147	158	158	158	158
c2 with LAD6K10 or LA6DK	163	163	159	170	170	170	170
c3 with LADT, R, S	171	171	167	178	178	178	178
with LADT, R, S and sealing cover	175	175	171	182	182	182	182

#### LC1D115 and D150 (3-pole), LC1D115004 (4-pole)

LC1	D115, D150	D115004	D1150046
a	120	150	155
b1 with LA4DA2	174	174	174
with LA4DF, DT	185	185	185
with LA4DM, DL	188	188	188
with LA4DW	188	188	188
c without cover or add-on blocks	132	132	115
with cover, without add-on blocks	136	—	—
c1 with LADN or C (2 or 4 contacts)	150	150	150
c2 with LA6DK20	155	155	155
c3 with LADT, R, S	168	168	168
with LADT, R, S and sealing cover	172	172	172



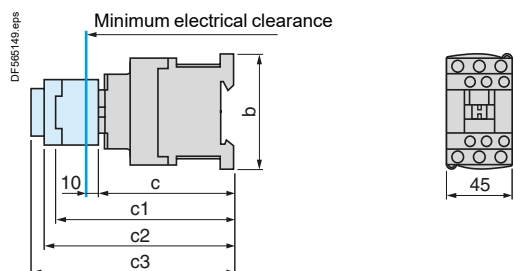
References:  
pages B8/8 to B8/14

Characteristics:  
pages B8/59 to B8/65

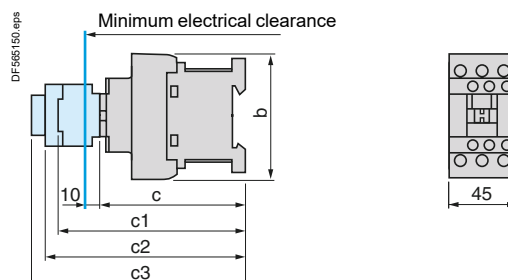
Schemes:  
pages B8/79 and B8/80



#### LC1D09...D18 (3-pole)

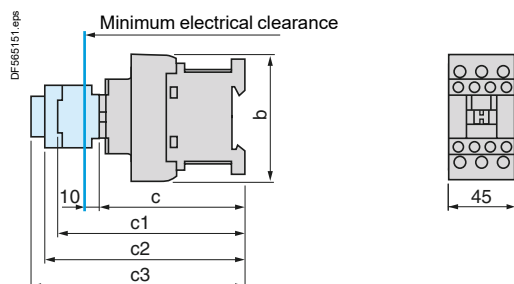


#### LC1D25...D38 (3-pole)



LC1	D09...D18	D093...D123	D099...D129	D25...D38	D183...D323
b	77	99	80	85	99
c without cover or add-on blocks	93	93	93	99	99
with cover, without add-on blocks	95	95	95	101	101
c1 with LADN or C (2 or 4 contacts)	126	126	126	132	132
c2 with LA6DK10	138	138	138	144	144
c3 with LADT, R, S	146	146	146	152	152
with LADT, R, S and sealing cover	150	150	150	156	156

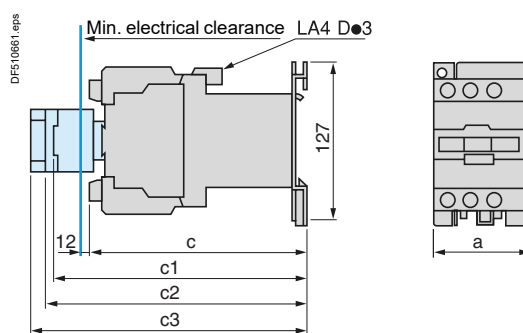
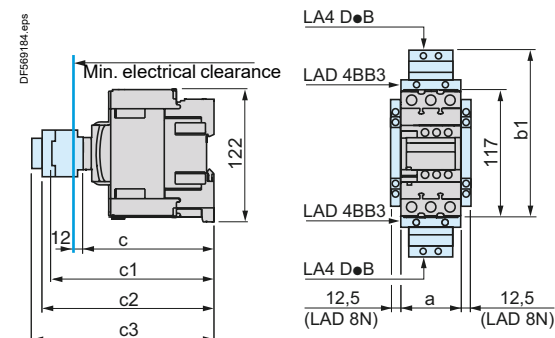
#### LC1DT20...DT40 (4-pole)



LC1	DT20 and DT25 D098 and D128	DT203 and DT253 D0983 and D1283	DT32 and DT40 D188...D258	DT323 and DT403 D1883 and D2583
b	85	99	91	105
c with cover	102	102	107	107
c1 with LADN or C (2 or 4 contacts)	123	123	131	131
c2 with LA6DK10	135	135	143	143
c3 with LADT, R, S	143	143	151	151
with LADT, R, S and sealing cover	147	147	155	155

#### LC1D40A...D80A (3-pole), LC1DT60A...DT80A (4-pole)

#### LC1D80 and D95 (3-pole), LP1D80004, LP1D80008 (4-pole), LP1D40008 and D65008 (4-pole)



	LC1D40A ... D80A	LC1 DT60A...DT80A	LP1D40008 and D65008	LC1 D80 and D95	LP1D80004	LP1D80008
a	55	72	85	85	96	96
b1 with LAD4BB3	136	136	—	—	—	—
with LA4DF, DT	157	157	—	—	—	—
c without cover or add-on blocks	118	118	182	181	181	196
with cover, without add-on blocks	120	120	—	186	—	—
c1 with LADN (1 contact)	—	—	196	204	204	204
with LADN or C (2 or 4 contacts)	150	150	202	210	210	210
c2 with LA6DK10	163	163	213	221	221	221
c3 with LADT, R, S	171	171	221	229	229	229
with LADT, R, S and sealing cover	175	175	225	233	233	233

LC1D115... and LC1D150... with coil: see page B8/72.

References:  
pages B8/8 to B8/14

Characteristics:  
pages B8/59 to B8/65

Schemes:  
pages B8/79 and B8/80

Ref.



Contactors



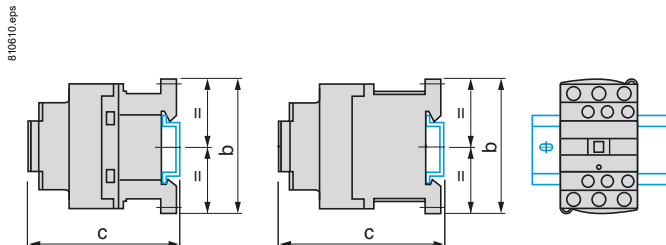
# TeSys

## TeSys D Contactors

### Mounting

#### LC1D09...D38, DT20...DT40

On mounting rail NSYSR200BD, NSYSR200BD or NSYSR200 (width 35 mm)



#### Control circuit: a.c.

LC1	D09... D18	D25... D38	DT20 and DT25	DT32 and DT40
b	77	85	85	100
c (NSYSR200BD or NSYSR200BD) <sup>(1)</sup>	88	94	94	109
c (NSYSR200) <sup>(1)</sup>	96	102	102	117

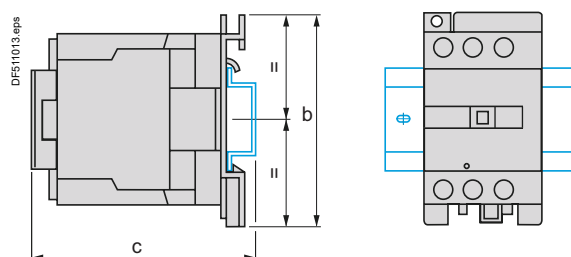
#### Control circuit: d.c.

LC1	D09... D18	D25... D38	DT20 and DT25	DT32 and DT40
b	77	85	94	109
c (NSYSR200BD or NSYSR200BD) <sup>(1)</sup>	97	103	103	118
c (NSYSR200) <sup>(1)</sup>	105	110	111	126

<sup>(1)</sup> With safety cover.

#### LC1D40A...D80A, LC1DT60A and DT80A, LC1D80 and D95, LC1D40008 and D65008

On mounting rail AM1DL201 (width 75 mm) <sup>(2)</sup>  
On mounting rail NSSDPR●● or NSYSR200 (width 35 mm)



#### Control circuit: a.c.

LC1	D40A...D80A DT60A...DT80A	D80 and D95	D40008 and D65008
b	122	127	127
c	—	147	143
c (AM1DL201) <sup>(1)</sup>	—	137	133
c (NSSDPR●● or NSYSR200) <sup>(1)</sup>	128	137	133

#### Control circuit: d.c.

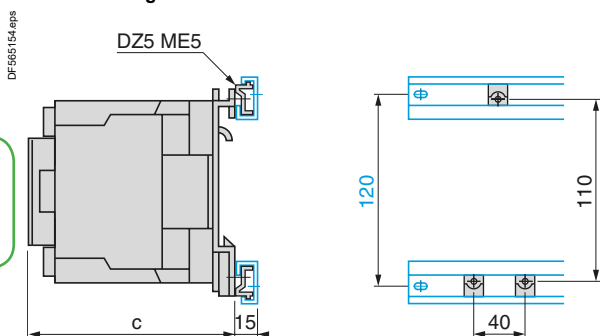
LC1	D40A...D80A DT60A...DT80A	D80 and D95	D40008 and D65008
b	—	205	200
c (AM1DL201) <sup>(1)</sup>	—	195	190
c (NSSDPR●● or NSYSR200) <sup>(1)</sup>	128	—	190

<sup>(1)</sup> With safety cover.

<sup>(2)</sup> Except for LC1D40A...D80A, LC1DT60A and DT80A.

#### LC1D80 and D95, LP1D80

On 2 mounting rails DZ5MB on 120 mm centres



#### Control circuit: a.c.

LC1	D80 and D95
c with cover	130

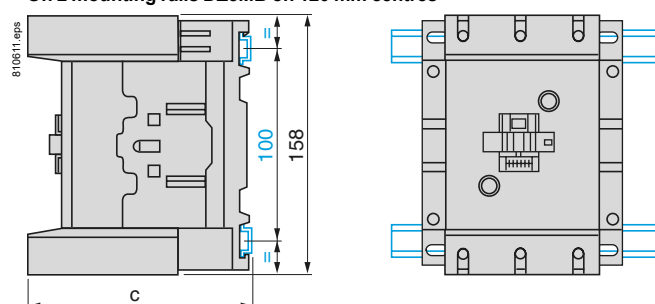
#### Control circuit: d.c.

LC1	D80 and D95
c with cover	186

LP1	D80
c	181

#### LC1D115, D150

On 2 mounting rails DZ5MB on 120 mm centres



#### Control circuit: a.c. or d.c.

LC1	D115 and D150	D1156 and D1506
c (NSYSR200BD or NSYSR200BD)	134.5	117.5
c (NSYSR200 or ED●●●)	142.5	125.5



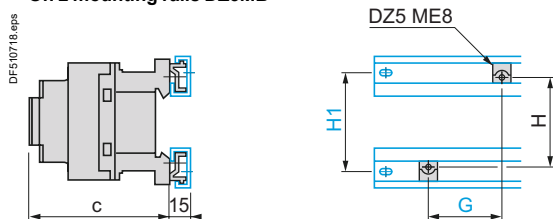
# TeSys

## TeSys D Contactors

### Mounting

#### LC1D09...D38 and LC1DT20...DT40

On 2 mounting rails DZ5MB



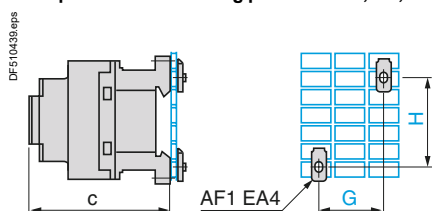
Control circuit:	a.c.		d.c.	
LC1	D09...D18	D25...D38	D09...D18	D25...D38
c with cover	86	92	95	101
G	35	35	35	35
H	60	60	70	70
H1	70	70	70	70

4-pole contactors

LC1	DT20 and DT25	DT32 and DT40	DT20 and DT25	DT32 and DT40
c	92	100	101	109
G	35	35	35	35
H	60	60	70	70
H1	70	70	70	70

#### LC1D09...D38 and LC1DT20...DT40

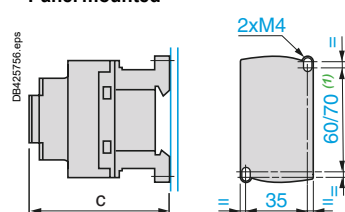
On pre-slotted mounting plate AM1 PA, PB, PC



Control circuit:	a.c.		d.c.	
LC1	D09...D18	D25...D38	D09...D18	D25...D38
c with cover	86	92	95	101
G	35	35	35	35
H	60/70	60/70	70	70
LC1	DT20 and DT25	DT32 and DT40	DT20 and DT25	DT32 and DT40
c with cover	80	93	118	132
G	35	35	35	35
H	60	60	70	70

#### LC1D09...D38, LC1DT20...DT40

Panel mounted

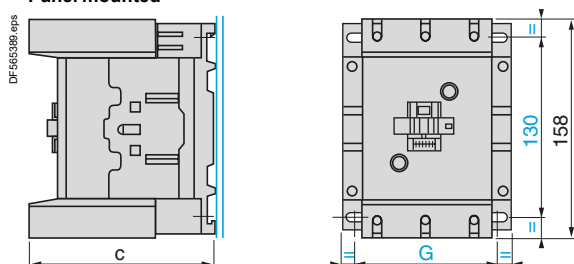


(1) for DC coil: 70 mm only.

Control circuit:	a.c.		d.c.	
LC1	D09...D18	D25...D38	D09...D18	D25...D38
c with cover	86	92	95	101
4-pole contactors				
LC1	DT20 and DT25	DT32 and DT40	DT20 and DT25	DT32 and DT40
c with cover	90	98	90	98

#### LC1D115, D150

Panel mounted



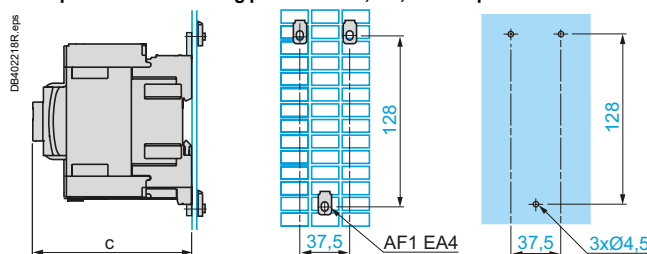
References:  
pages B8/8 to B8/14

Characteristics:  
pages B8/59 to B8/65

Schemes:  
pages B8/79 and B8/80

#### LC1D40A...D80A, LC1DT60A...DT80A

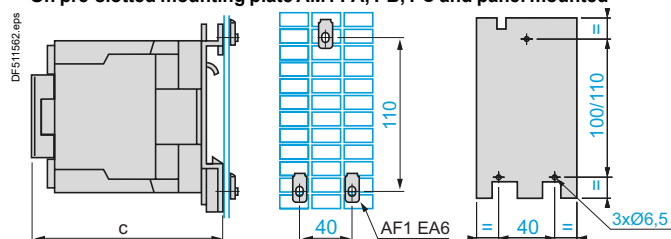
On pre-slotted mounting plate AM1 PA, PB, PC and panel mounted



Control circuit:	a.c.	d.c.
LC1	D40A...D80A, DT60A...DT80A	D40A...65A, DT60A...DT80A
c with cover	120	120

#### LC1D80 and D95, LC1D40008 and D65008, LP1D80

On pre-slotted mounting plate AM1 PA, PB, PC and panel mounted



Control circuit:	a.c.	d.c.
LC1	D80 and D95, D40008 and D65008	D80 and D95 D40008 and D65008
c with cover	130	186
LP1	—	D80
c without cover	—	181

LC1	D115	D1156	D150	D1506
c	132	115	132	115
G (3-pole)	96/110	96/110	96/110	96/110
G (4-pole)	130/144	130/144	—	—

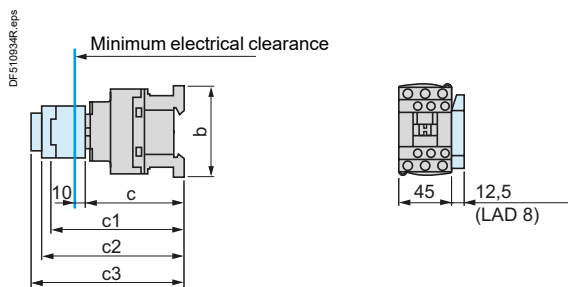


# TeSys

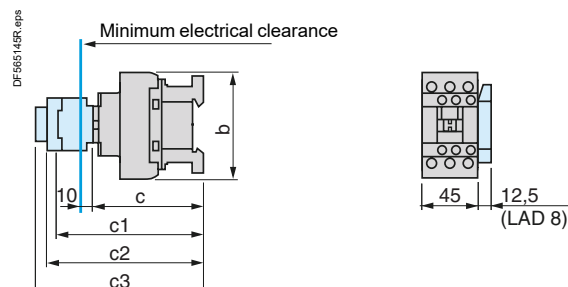
## TeSys D Green Contactors

### Dimensions

#### LC1D09...D18 (3-pole), with AC/DC compatible coil

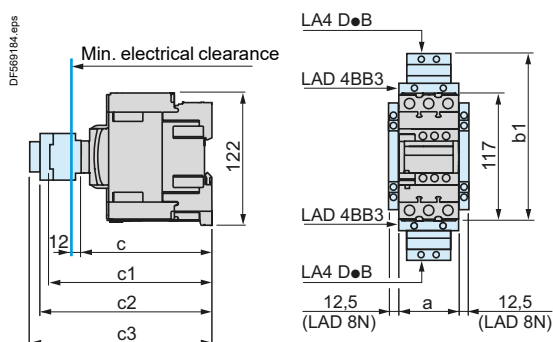


#### LC1D25...D38 (3-pole), with AC/DC compatible coil



LC1	D09...D18	D25...D38
b without add-on blocks	77	85
c without cover or add-on blocks	84	90
with cover, without add-on blocks	86	92
c1 with LADN or C (2 or 4 contacts)	117	123
c2 with LA6DK10	129	135
c3 with LADT, R, S	137	143
with LADT, R, S and sealing cover	141	147

#### LC1D40A...D80A (3-pole), LC1DT60A...DT80A (4-pole), with AC/DC compatible coil



LC1	D40A...D80A	DT60A...DT80A
a	55	70
b1 LAD4BB3	136	—
with LAD4DWB	166	—
c without cover or add-on blocks	118	118
with cover, without add-on blocks	120	120
c1 with LADN (1 contact)	—	—
with LADN or C (2 or 4 contacts)	150	150
c2 with LAD6K10	163	163
c3 with LADT, R, S	171	171
with LADT, R, S and sealing cover	175	175



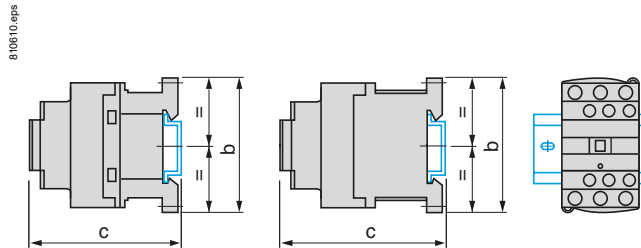
# TeSys

## TeSys D Green Contactors

### Mounting

#### LC1D09...D38 (3-pole), with AC/DC compatible coil

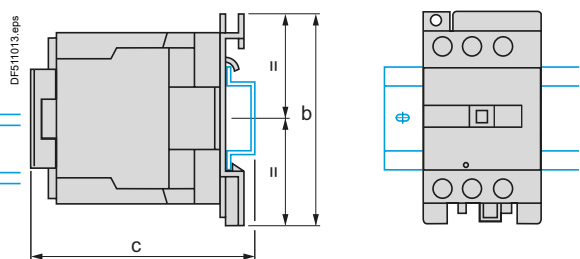
On mounting rail NSYSR200BD, NSYSR200BD or NSYSR200 (width 35 mm)



LC1	D09...D18	D25...D38
b	77	85
c (NSYSR200BD or NSYSR200BD)	88	94
c (NSYSR200)	96	102

#### LC1D40A...D80A (3-pole), LC1DT60A and DT80A (4-pole), with AC/DC compatible coil

On mounting rail AM1DL201 (width 75 mm) <sup>(2)</sup>  
On mounting rail NSSDPR●● or NSYSR200 (width 35 mm)



LC1	D40A...D80A DT60A...DT80A
b	122
c	—
c (AM1DL201)	—
c (NSSDPR●● or NSYSR200)	128

Ref.



Contactors



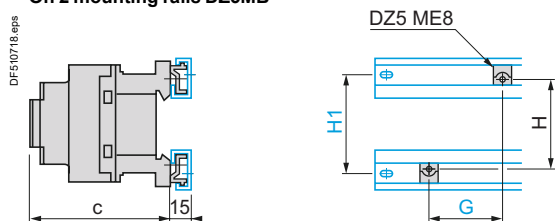
# TeSys

## TeSys D Green Contactors

### Mounting

#### LC1D09...D38 (3-pole), with AC/DC compatible coil

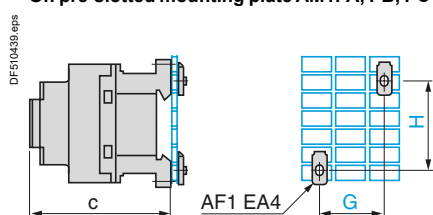
On 2 mounting rails DZ5MB



LC1	D09...D18	D25...D38
c with cover	86	92
G	35	35
H	60	60
H1	70	70

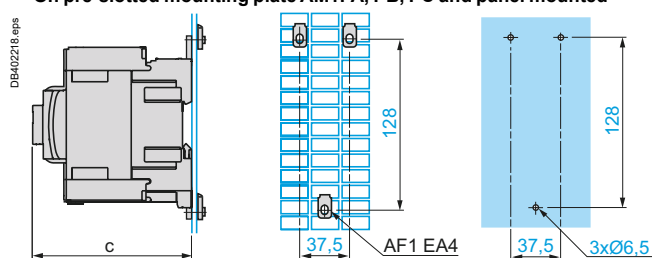
#### LC1D09...D38 (3-pole), with AC/DC compatible coil

On pre-slotted mounting plate AM1PA, PB, PC



#### LC1D40A...D80A (3-pole), LC1DT60A...DT80A (4-pole), with AC/DC compatible coil

On pre-slotted mounting plate AM1PA, PB, PC and panel mounted

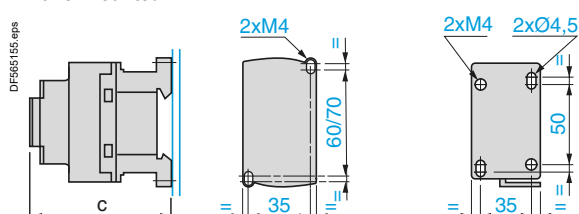


Ref.

LC1	D09...D18	D25...D38
c with cover	86	92
G	35	35
H	60/70	60/70

#### LC1D09...D38 (3-pole), with AC/DC compatible coil

Panel mounted



LC1	D09...D18	D25...D38
c with cover	86	92

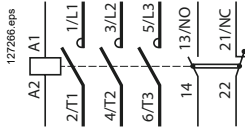
Contactors



#### Contactors

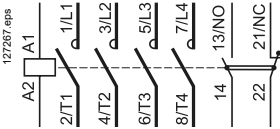
**TeSys D, TeSys D Green 3-pole contactors** (References: pages B8/8 to B8/11)

LC1D09 to D150

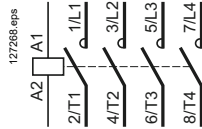


**TeSys D 4-pole contactors** (References: pages B8/12 and B8/13)

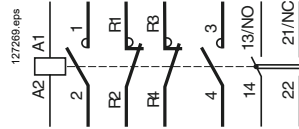
LC1DT20 to DT80A



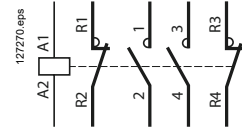
LC1D115004



LC1D098 to D258



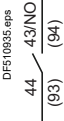
LC1 and LP1D40008 to D80008



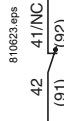
#### Front mounting add-on contact blocks

**Instantaneous auxiliary contacts for TeSys D, TeSys D Green** (References: page B8/22)

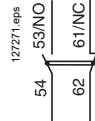
1 N/O LADN10 <sup>(1)</sup>



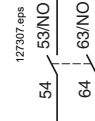
1 N/C LADN01 <sup>(1)</sup>



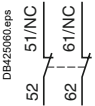
1 N/O + 1 N/C LADN11



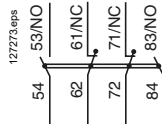
2 N/O LADN20



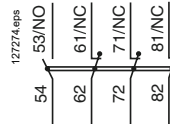
2 N/C LADN02



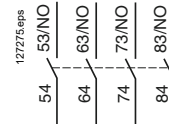
2 N/O + 2 N/C LADN22



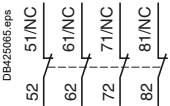
1 N/O + 3 N/C LADN13



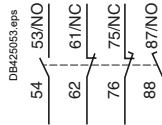
4 N/O LADN40



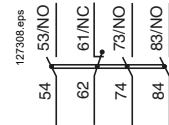
4 N/C LADN04



2 N/O + 2 N/C including 1 N/O + 1 N/C make before break LADC22

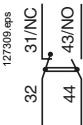


3 N/O + 1 N/C LADN31

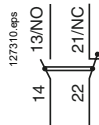


**Instantaneous auxiliary contacts conforming to standard EN 50012 for TeSys D, TeSys D Green** (References: page B8/22)

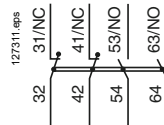
1 N/O + 1 N/C LADN11G



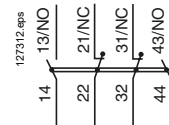
1 N/O + 1 N/C LADN11P



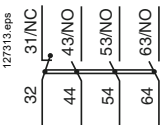
2 N/O + 2 N/C LADN22G



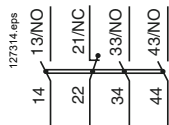
2 N/O + 2 N/C LADN22P



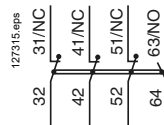
3 N/O + 1 N/C LADN31G



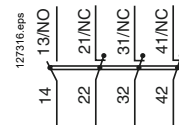
3 N/O + 1 N/C LADN31P



1 N/O + 3 N/C LADN13G



1 N/O + 3 N/C LADN13P



<sup>(1)</sup> Items in brackets refer to blocks mounted on right-hand side of contactor.



# TeSys

## TeSys D Green, TeSys D Contactors

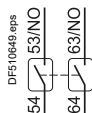
### Schemes

#### Front mounting add-on contact blocks for TeSys D, TeSys D Green

Dust and damp protected instantaneous auxiliary contacts (References: page B8/22)

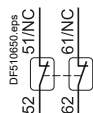
2 N/O (24-50 V)

LA1DX20

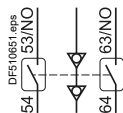


2 N/C (24-50 V)

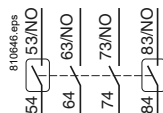
LA1DX02



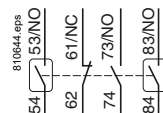
2 N/O (5-24V) with 2 cable screen terminals  
LA1DY20



2 N/O protected (24-50 V)  
2 N/O standard  
LA1DZ40



2 N/O protected (24-50 V)  
+ 1 N/O + 1 N/C standard  
LA1DZ31

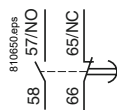


Time delay auxiliary contacts (References: page B8/23)

On-delay 1 N/O + 1 N/C  
LADT



Off-delay 1 N/O + 1 N/C  
LADR

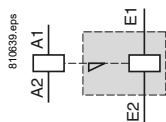


On-delay 1 N/C + 1 N/O break before make  
LADS



#### Mechanical latch blocks for TeSys D, TeSys D Green (References: page B8/23)

LAD6K10 and LA6DK20



Ref.

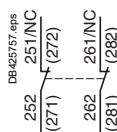
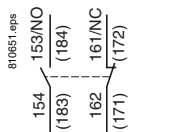
#### Side mounting add-on contact blocks for TeSys D, TeSys D Green

Instantaneous auxiliary contacts (References: page B8/22)

1 N/O + 1 N/C LAD8N11 <sup>(1)</sup>

2 N/O LAD8N20 <sup>(1)</sup>

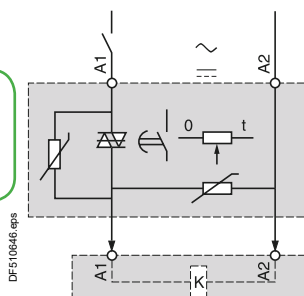
2 N/C LAD8N02 <sup>(1)</sup>



<sup>(1)</sup> Items in brackets refer to blocks mounted on right-hand side of contactor.

#### Electronic serial timer modules for TeSys D, TeSys D Green

On-delay LA4DTeU

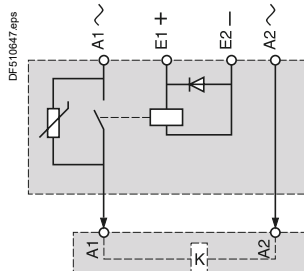


Contactors

#### Interface modules

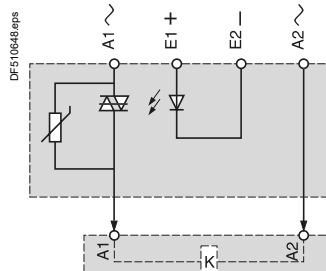
Relay output for TeSys D

LA4DFB



Solid state for TeSys D, TeSys D Green

LA4DWB



References: page B8/85.

References:  
pages B8/22 to B8/26

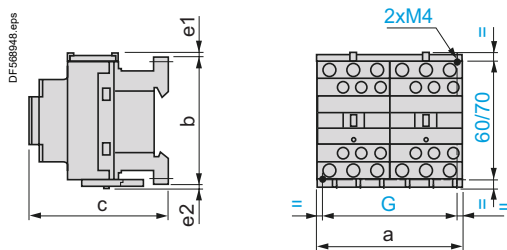
Characteristics:  
pages B8/66 to B8/70

Dimensions:  
pages B8/72 and B8/73, B8/76



#### LC2D09 to D38 TeSys D, TeSys D Green

2 x LC1D09 to D38



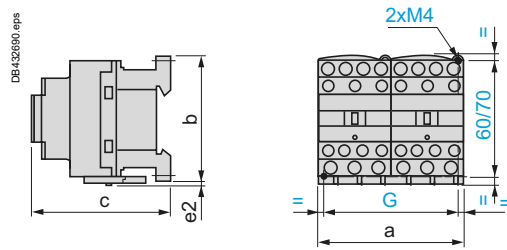
LC2 or 2 x LC1	a	b	c <sup>(1)</sup>	e1	e2	G
D09 to D18 AC, AC/DC	90	77	86	4	1.5	80
D093 to D123 AC	90	99	86	—	—	80
D09 to D18 DC	90	77	95	4	1.5	80
D093 to D123 DC	90	99	95	—	—	80
D25 to D38 AC, AC/DC	90	85	92	9	5	80
D183 to D383 AC	90	99	92	—	—	80
D25 to D32 DC	90	85	101	9	5	80
D183 to D383 DC	90	99	101	—	—	80

e1 and e2: including cabling.

(1) With safety cover, without add-on block.

#### LC2DT20 to DT40 TeSys D

2 x LC1DT20 to DT40

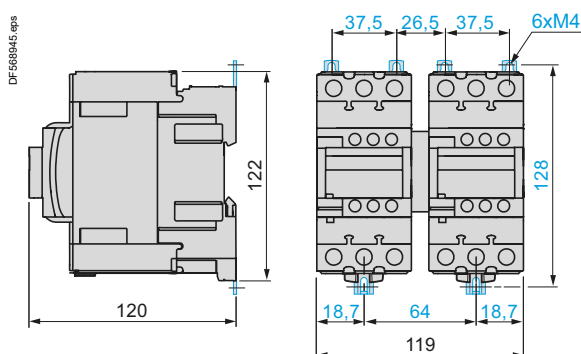


LC2 or 2 x LC1	a	b	c	G	e2
DT20 and DT25 AC	90	85	92	80	20
DT32 and DT40 AC	90	91	99	80	22
DT20 and DT25 DC	90	85	102	80	20
DT32 and DT40 DC	90	91	109	80	22

c, e: including cabling.

#### LC2D40A to D80A for TeSys D, TeSys D Green

2 x LC1D40A to D80A



Ref.



Contactors



# TeSys

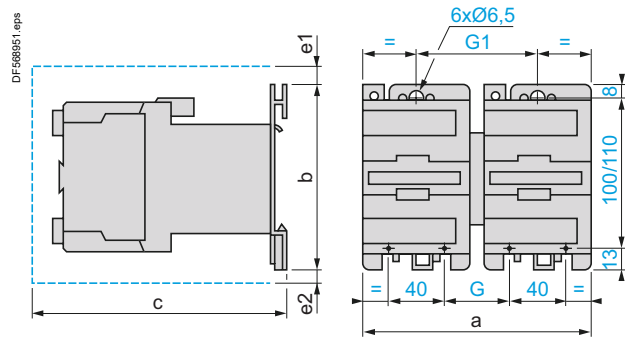
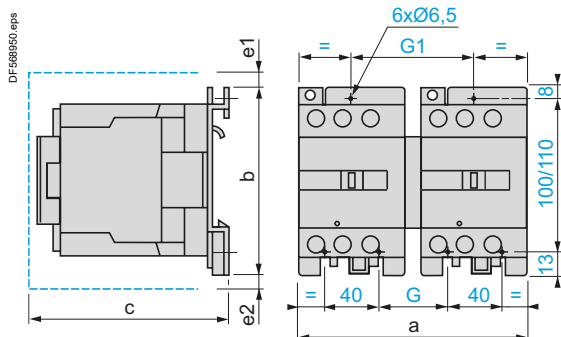
## TeSys D Reversing and changeover contactors

### Dimensions

#### LC2D80 and D95

2 x LC1D80 and D95 ~

2 x LC1D80 and D95 ~



LC2 or 2 x LC1	a	b	c	e1	e2	G	G1
D80 and D95 ~	182	127	158	13	—	57	96
D80004 ~	207	127	158	—	20	71	111

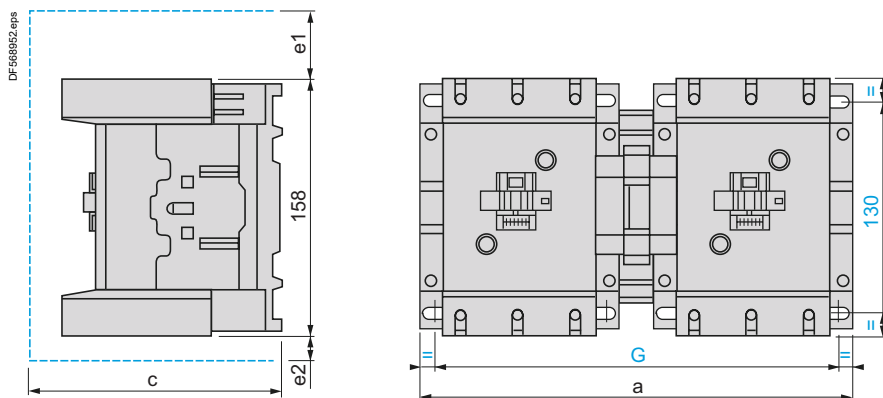
c, e1 and e2: including cabling.

2 x LC1	a	b	c	e1	e2	G	G1
D80 and D95	207	127	215	13	20	96	111

c, e1 and e2: including cabling.

#### LC2D115 and D150

2 x LC1D115 and D150



LC2 or 2 x LC1	a	c	e1	e2	G
D115 and D150	266	148	56	18	242/256
D115004	334	148	—	60	310/324

c, e1 and e2: including cabling.

Ref.



Contactors

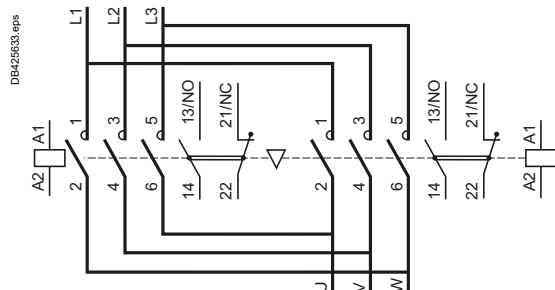


### Schemes

#### Reversing contactors for motor control

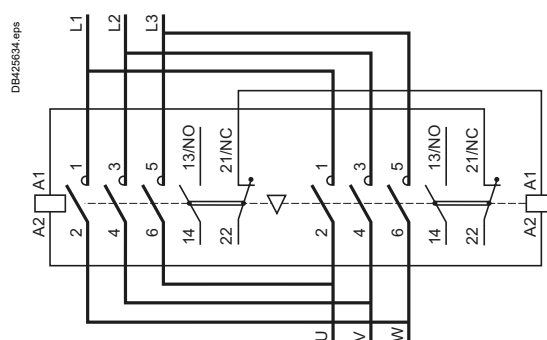
LC2D09...D80A TeSys D, TeSys D Green LC2D80...D150 TeSys D

Horizontally mounted



LAD9R1V TeSys D, TeSys D Green

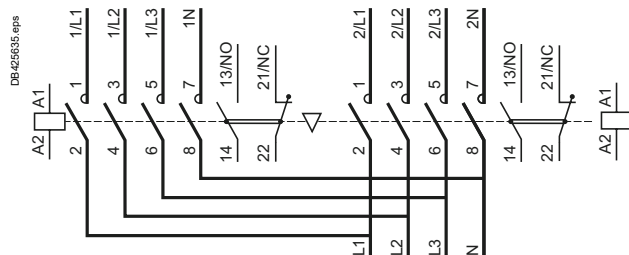
With integral electrical interlocking



#### Changeover contactor pairs TeSys D

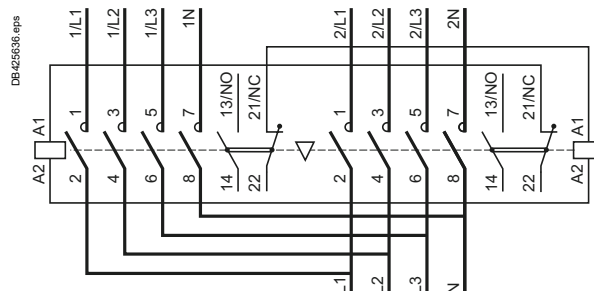
LC2DT20...DT40

Horizontally mounted



LADT9R1V

With integral electrical interlocking



Ref.



Contactors



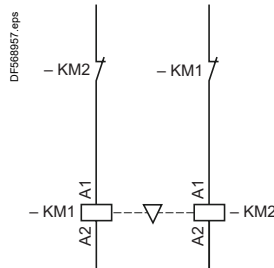
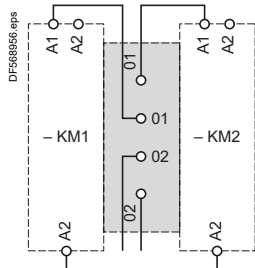
#### Electrical interlocking of TeSys D, TeSys D Green reversing contactors fitted with:

**Mechanical interlock with integral electrical contacts**

LA9D4002, LA9D8002 and LA9D11502

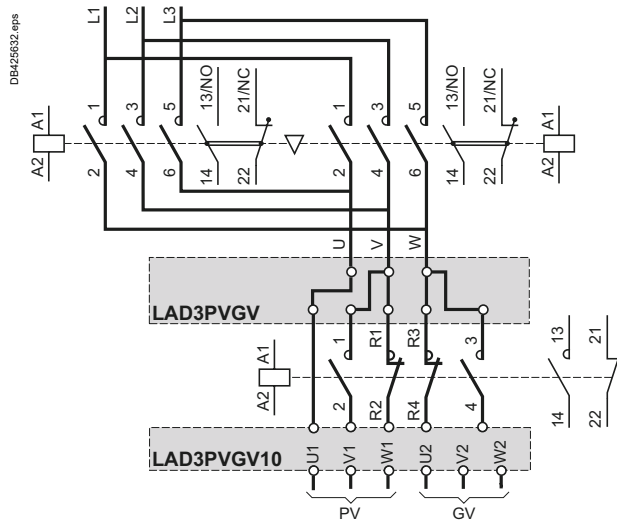
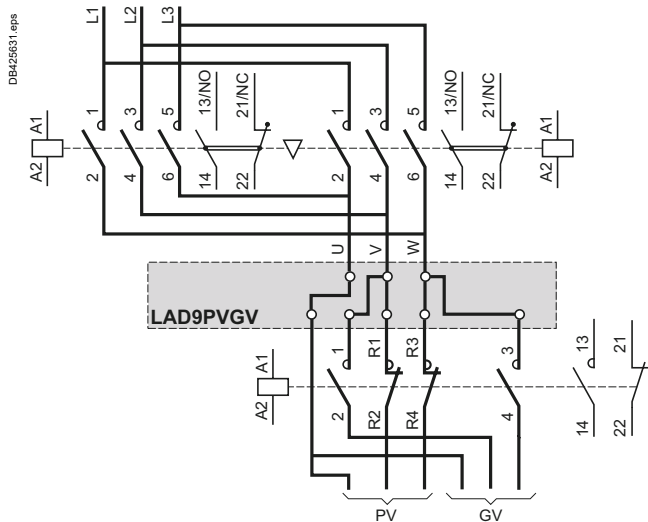
**Mechanical interlock without integral electrical contacts**

LAD9V2, LAD4CM, LA9D50978 and LA9D80978



**Low speed - High speed cabling kit, screw clamp terminals for LC1D09... D38 contactors (TeSys D, TeSys D Green)**

**Low speed - High speed cabling kit, spring terminals for LC1D09... D38 contactors (TeSys D)**



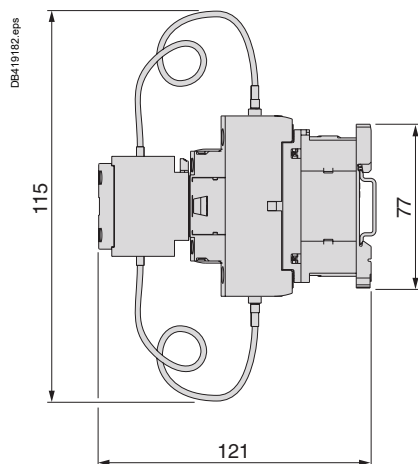
Ref.



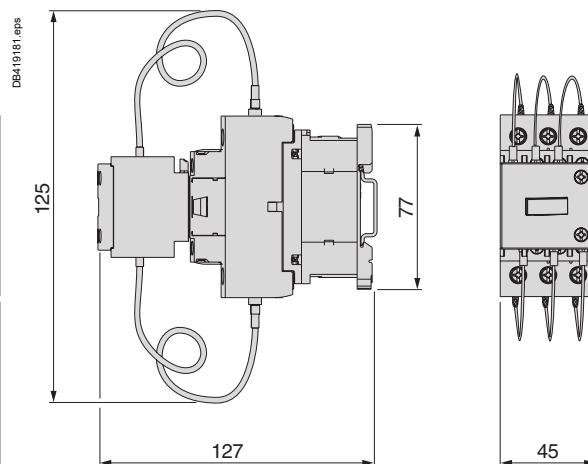


#### Dimensions

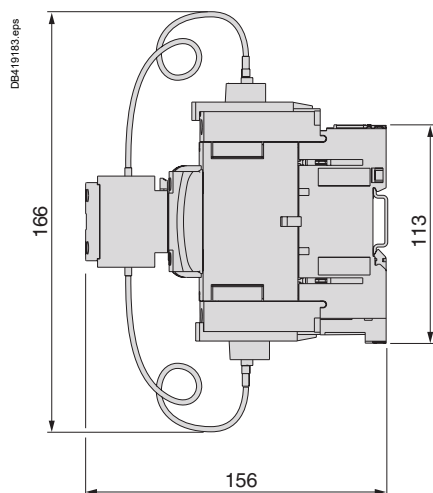
##### LC1DFK



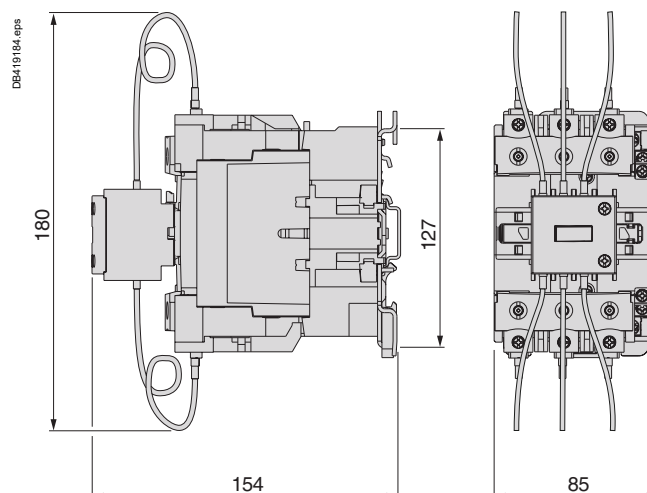
##### LC1DGK, DLK, DMK



##### LC1DPK, DTK



##### LC1DWK

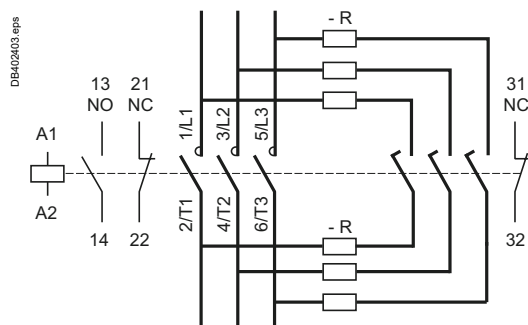


Ref.

Contactors

#### Scheme

##### LC1D•K



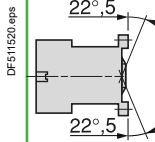
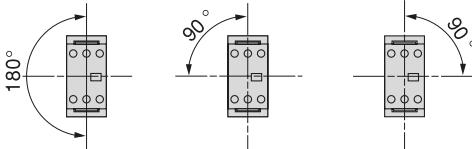
R = Pre-wired resistor connections.



TeSys

TeSys SK Mini-contactors

Characteristics

Environment				
Rated insulation voltage (Ui)	Conforming to 60947	V	690	
Conforming to standards			IEC/EN 60947-4-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1	
Approvals			cULus, CCC, EAC, CB certification	
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP2x	
Ambient air temperature around the device	Storage	°C	-50...+70	
	Operation	°C	-20...+50	
Maximum operating altitude	Without derating	m	2000	
Operating position			<div><div><div><b>Vertical axis</b></div><div></div><div>Without derating</div></div><div><div><b>Horizontal axis</b></div><div></div><div>Without derating</div></div></div>	
Cabling, screw clamp terminals			Min	Max
	Solid conductor	mm²	1 x 1.5 or 2 x 1.5	1 x 6 or 2 x 4
	Flexible cable without cable end	mm²	1 x 0.5 or 2 x 0.35	1 x 6 or 2 x 2.5
	Flexible cable with cable end	mm²	1 x 0.35 or 2 x 0.35	1 x 6 or 2 x 1.5
Tightening torque	Pozidriv n° 1 head	N.m	0.8	
Terminal referencing			Conforming to standards En 50005	





Pole characteristics			
Conventional thermal current (Ith)	For ambient temperature $\leq 55^{\circ}\text{C}$	A	12
Rated operational frequency		Hz	50/60
Frequency limits of the operational current		Hz	Up to 400
Rated operational voltage (Ue)		V	690
Rated making capacity	I rms conforming to IEC 60947-1	A	66
Rated breaking capacity (for Ue $\leq 400\text{ V}$ )	Conforming to IEC 60947-1	A	52
Short time rating	In free air for a time "t" from cold state ( $\theta \leq 55^{\circ}\text{C}$ )	A	50
Short-circuit protection	gl fuse U $\leq 440\text{ V}$	A	16
Average impedance per pole	At Ith and 50 Hz	m $\Omega$	4
Maximum rated operational current			
For a temperature $\leq 55^{\circ}\text{C}$	AC-3 <sup>(1)</sup> (Ue $\leq 400\text{ V}$ )	A	6
	AC-1	A	12
Utilisation in category AC-1 resistive circuits, heating, lighting (Ue $\leq 440\text{ V}$ )	Increase in operational current by paralleling of poles	A	20
Auxiliary contact characteristics of add-on blocks			
Rated operational voltage (Ue)	Up to	V	690
Rated insulation voltage (Ui)	Conforming to IEC 60947, IEC 60947-1	V	690
Conventional thermal current (Ith)	For ambient temperature $\leq 55^{\circ}\text{C}$	A	10
Frequency of operational current		Hz	Up to 400
Short-circuit protection	Conforming to IEC 60947 and IEC 60947-1, gl fuse	A	10

### Operational power of contacts conforming to IEC 60947

#### a.c. supply, category AC-15

Electrical durability (valid up to 3600 operating cycles per hour) on an inductive load such as the coil of an electromagnet: making current ( $\cos \varphi 0.7$ ) = 10 times the breaking current ( $\cos \varphi 0.4$ ).

	V	24	48	110/ 127	220/ 230	380/ 400	440
1 million operating cycles	VA	48	96	240	440	800	880
3 million operating cycles	VA	17	34	86	158	288	317
10 million operating cycles	VA	7	14	36	66	120	132
Occasional making capacity	VA	1000	2050	5000	10000	14000	13000

#### d.c. supply, category DC-13

Electrical durability (valid up to 1200 operating cycles per hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

	V	24	48	110	220	440	440
1 million operating cycles	W	120	80	60	52	51	880
3 million operating cycles	W	55	38	30	28	26	317
10 million operating cycles	W	15	11	9	8	7	132
Occasional making capacity	W	720	600	400	300	230	13000

<sup>(1)</sup> For LC1 contactors.



# TeSys

## TeSys SK Mini-contactors

### Characteristics

Control circuit characteristics				
Type			LC1SK06	LP1SK06
Rated control circuit voltage (Uc)		V	~ 24...400	~ 12...72
Control voltage limits (q ≤ 50 °C)	For operation		0.85...1.1 Uc	0.85...1.1 Uc
	For drop-out		≥ 0.20 Uc	≥ 0.10 Uc
Average coil consumption at 20 °C and at Uc	Inrush		16 VA	2.2 W
	Sealed		4.2 VA	2.2 W
Heat dissipation		W	1.4	2.2
Operating time at 20 °C and at Uc				
Between coil energisation and	opening of the N/C contacts	ms	8...16	10...18
	closing of the N/O contacts	ms	7...14	8...12
Between coil de-energisation and	opening of the N/O contacts	ms	6...8	4...6
	closing of the N/C contacts	ms	8...10	6...8
Maximum operating rate	In operating cycles per hour		1200	1200
Mechanical durability at Uc In millions of operating cycles	50/60 Hz coil		10	–
	~ coil		–	10

Ref.



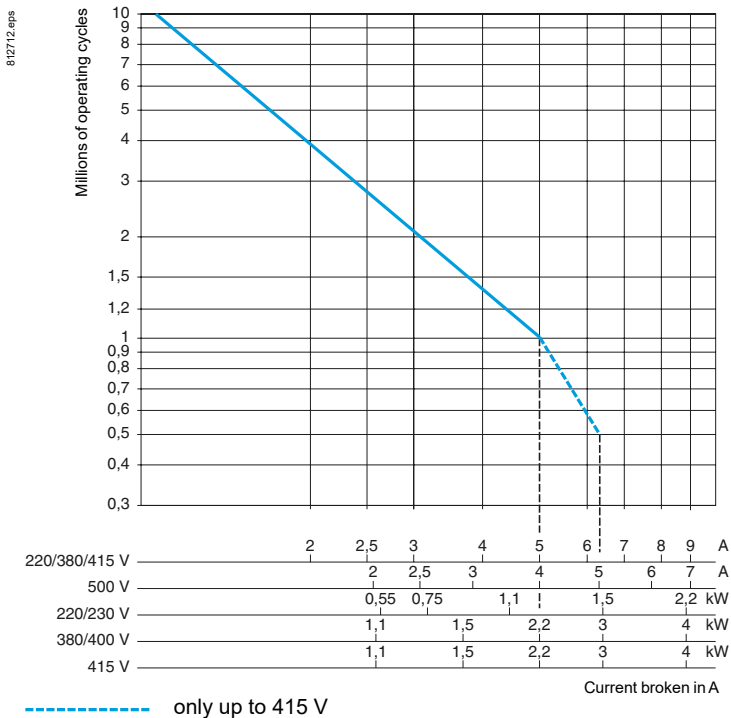
Contactors



Use in category AC-3 ( $U_e \leq 440\text{ V}$ )

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.

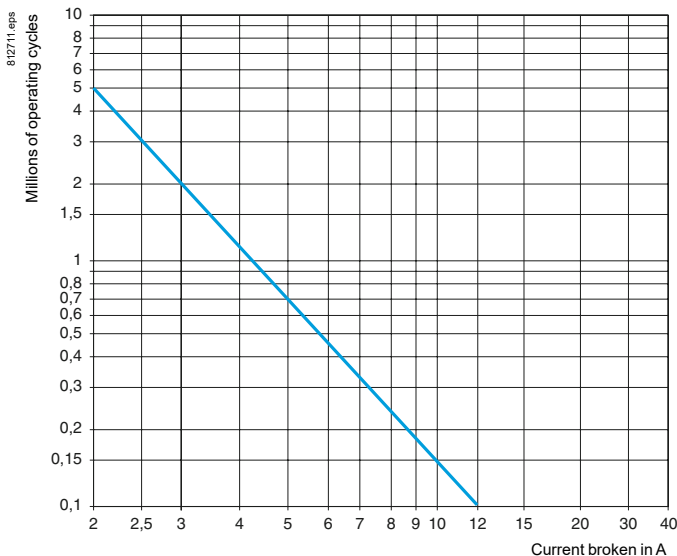
The current broken ( $I_c$ ) in category AC-3 is equal to the rated operational current ( $I_e$ ) of the motor.



Use in category AC-1 ( $U_e \leq 440\text{ V}$ )

Control of resistive circuits ( $\cos \varphi \geq 0.95$ ).

The current broken ( $I_c$ ) in category AC-1 is equal to the current ( $I_e$ ) normally drawn by the load.





# TeSys

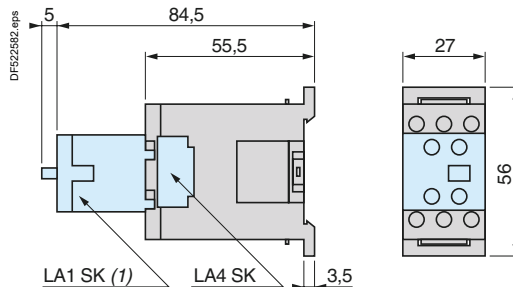
## TeSys SK Mini-actuators

### Dimensions, mounting and schemes

#### Dimensions

##### Mini-actuators

##### LC1 and LP1SK06



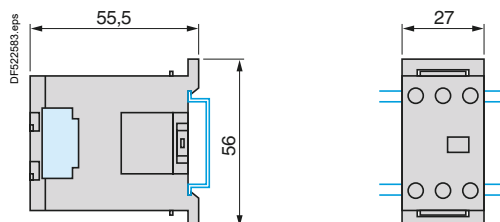
(1) Only on LC1SK06.

#### Mounting

##### Mini-actuators

##### LC1 and LP1SK06

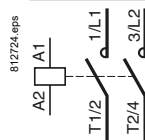
On mounting rail NSYSR200BD or NSYSR200 (L 35 mm)



#### Schemes

##### 2-pole mini-actuators

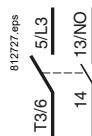
##### LC1 and LP1SK06



##### Add-on power pole block

##### 1 pole + 1 "N/O" aux.

##### LA1SK10



##### 1 pole + 1 "N/C" aux.

##### LA1SK01



##### Instantaneous auxiliary contacts

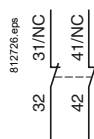
##### 2 "N/O"

##### LA1SK20



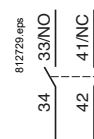
##### 2 "N/C"

##### LA1SK02



##### 1 "N/O" + 1 "N/C"

##### LA1SK11

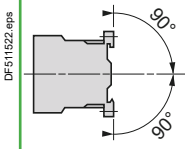
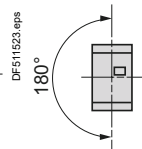
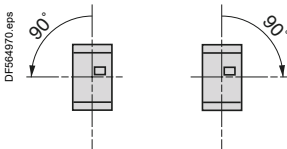




# TeSys

## TeSys K Contactors and reversing contactors

### Characteristics

Environment characteristics							
Conforming to standards				IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4			
Product certifications		LC● and LP●K06 to K12		UL, CSA, CCC, EAC, CB certification			
		LC● and LP●K16		CB certification, CCC, EA			
Operating positions				<div><div><div>Vertical axis</div><div></div><div>Without derating</div></div><div><div>Horizontal axis</div><div></div><div>Without derating</div></div><div><div></div><div>Possible positions for LC●K only. Contactor pull-in voltage: 0.85 Uc</div></div></div>			
Connection							
Screw clamp terminals	Solid conductor	mm <sup>2</sup>	Min.		Max.	Max. to IEC 60947	
		mm <sup>2</sup>	1 x 1.5		2 x 4	1 x 4 + 1 x 2.5	
		mm <sup>2</sup>	1 x 0.75		2 x 4	2 x 2.5	
	Flexible conductor without cable end	mm <sup>2</sup>	1 x 0.34		1 x 1.5 + 1 x 2.5	1 x 1.5 + 1 x 2.5	
		Spring terminals	Solid conductor	mm <sup>2</sup>	1 x 0.75	1 x 1.5	2 x 1.5
			Flexible conductor without cable end	mm <sup>2</sup>	1 x 0.75	1 x 1.5	2 x 1.5
Faston connectors	Clip	mm	2 x 2.8 or 1 x 6.35				
Solder pins for printed circuit board			With locating device between power and control circuits pins length 5 mm Recommended minimum width and thickness layer for power printed circuit board track : 4mm x 35 microns				
Tightening torque		of screw-clamp terminals only Phillips head n° 2 and Ø6	N.m	0.8			
Terminal referencing		Conforming to standards EN 50005 and EN 50012		Up to 5 contacts, depending on model			
Rated insulation voltage (Ui)		Conforming to IEC 60947-4-1	V	690			
		Conforming to CSA 22-2 n° 60947-4-1, UL 60947-4-1	V	600			
Rated impulse withstand voltage (Uimp)			kV	8			
Degree of protection		Conforming to IEC 60529		Protection against direct finger contact IP2x			
Ambient air temperature around the device		Storage	°C	-50...+80			
		Operation	°C	-25...+50 in AC3, -25...+60 in AC1			
Maximum operating altitude		Without derating	m	2000			
Vibration resistance 5 ... 300 Hz		Contacteur open		2 gn			
		Contacteur closed		4 gn			
Flame resistance		according to IEC 60695-2-10	°C	850			
Shock resistance (1/2 sine wave, 11 ms)		Contacteur open		On X axis: 6 gn On Y and Z axes: 10 gn			
		Contacteur closed		On X axis: 10 gn On Y and Z axes: 15 gn			



# TeSys

## TeSys K Contactors and reversing contactors

### Characteristics

Pole characteristics							
Type	LC● or LP●			K06	K09	K12	K16
Conventional thermal current (I <sub>th</sub> )	For ambient temperature ≤ 60 °C		A	20 <sup>(1)</sup>			
Rated operational frequency			Hz	50/60			
Frequency limits of the operational current			Hz	Up to 400			
Rated operational voltage (U <sub>e</sub> )			V	690			
Rated making capacity	I rms conforming to IEC 60947		A	110	110	144	160
Rated breaking capacity	I rms conforming to IEC 60947	220/230 V	A	110	110	—	—
		380/400 V	A	110	110	—	—
		415 V	A	110	110	—	—
		440 V	A	110	110	110	110
		500 V	A	80	80	80	80
		660/690 V	A	70	70	70	70
Permissible short time rating	In free air for a time "t" from cold state (θ ≤ 50 °C)	1 s	A	90	90	115	115
		5 s	A	85	85	105	105
		10 s	A	80	80	100	100
		30 s	A	60	60	75	75
		1 min	A	45	45	55	55
		3 min	A	40	40	50	50
		≥ 15 min	A	20	20	25	25
Short-circuit protection	gG fuse U ≤ 440 V (aM fuse, see page 22009/2)		A	25			
Average impedance per pole	At I <sub>th</sub> and 50 Hz		mΩ	3			
Use in category AC-1 resistive circuits, heating, lighting (U <sub>e</sub> ≤ 440 V)	Maximum rated operational current for a temperature ≤ 50 °C			20			
				16 for U <sub>e</sub> only			
		Rated operational current limits in relation to the on-load factor and operating frequency		On-load factor			
				90 %    60 %    30 %			
				300 operating cycles/hour			
	Increase in rated operational current by paralleling of poles			13    15    18			
				120 operating cycles/hour			
				15    18    19			
				30 operating cycles/hour			
				19    20    20			
Use in category AC-3 squirrel cage motors	Operational power according to the voltage. Voltage 50 or 60 Hz	115 V single-ph.	kW	0.37	0.55	—	—
		220 V single-ph.	kW	0.75	1.1	—	—
		220/230 V 3-ph.	kW	1.5	2.2	3	4
		380/415 V 3-ph.	kW	2.2	4	5.5	7.5
		440/480 V 3-ph.	kW	3	4	5.5/4 (480)	5.5/4 (480)
		500/600 V 3-ph.	kW	3	4	4	4
		660/690 V 3-ph.	kW	3	4	4	4
	Maximum operating rate (in operating cycles/hour in relation to % of rated power)			Op. cycles/h			
				600    900    1200			
				Power			
				100 %    75 %    50 %			

(1) For LC●K●●●●●3 / LP●K●●●●●3 with spring terminal, I<sub>th</sub> max = 10 A.



# TeSys

## TeSys K Contactors and reversing contactors

### Characteristics

Control circuit characteristics										
Type			LC1	LC2	LC7	LC8	LP1	LP2	LP4	LP5
Rated control circuit voltage (Uc)		V	~ 12...690 <sup>(1)</sup>		~ 24...240 <sup>(1)</sup>		~ 12...250 <sup>(1)</sup>		~ 12...120	
Control voltage limits (≤ 50 °C) single voltage coil	Operation		0.8...1.15 Uc <sup>(2)</sup>		0.85...1.1 Uc		0.8...1.15 Uc		0.7...1.30 Uc	
	Drop-out		≥ 0.20 Uc		≥ 0.10 Uc		≥ 0.10 Uc		≥ 0.10 Uc	
Average consumption at 20 °C and at Uc	Inrush		30 VA		3 VA		3 W		1.8 W	
	Sealed		4.5 VA		3 VA		3 W		1.8 W	
Heat dissipation		W	1.3		3		3		1.8	
Operating time at 20 °C and at Uc										
Between coil energisation and:	- opening of the N/C contacts	ms	5...15		25...35		25...35		25...35	
	- closing of the N/O contacts	ms	10...20		30...40		30...40		30...40	
Between coil de-energisation and:	- opening of the N/O contacts	ms	10...20		30		10		10...20	
	- closing of the N/C contacts	ms	15...25		40		15		15...25	
Maximum immunity to microbreaks		ms	2		2		2		2	
Maximum operating rate	In operating cycles per hour		3600		3600		3600		3600	
Mechanical durability at Uc	50/60 Hz coil		10	5	10	5	—	—	—	—
In millions of operating cycles	— coil		—	—	—	—	10	5	—	—
	Wide range coil, Low consumption		—	—	—	—	—	—	30	5

<sup>(1)</sup> For mains supplies with a high level of interference (voltage surge > 800 V), use a suppressor module **LA4KE1FC** (50...129 V) or **LA4KE1UG** (130...250 V), see page B8/49.

<sup>(2)</sup> **LC1K12**, **LC1K16**... : 0.85...1.15 Uc.

Ref.



Contactors



# TeSys

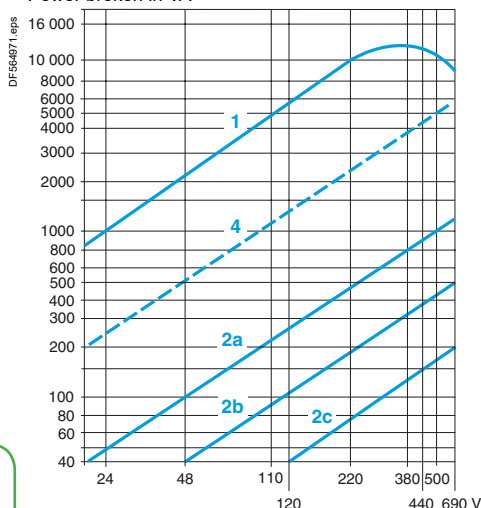
## TeSys K Contactors and reversing contactors

### Characteristics and durability curves

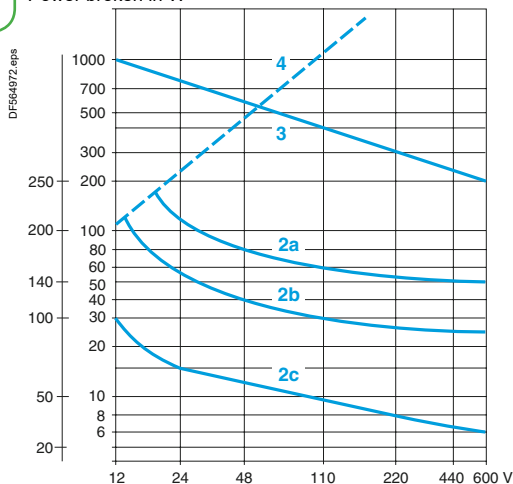
#### Auxiliary contact characteristics of contactors and instantaneous contact blocks

Number of auxiliary contacts	On LC●K or LP●K 3-pole		1	
	On LA1K		2 or 4	
Rated operational voltage (Ue)	Up to	V	690	
Rated insulation voltage (Ui)	Conforming to IEC 60947	V	690	
	Conforming to UL 60947-5-1, CSA C22.2 n° 60947-5-1	V	600	
Conventional thermal current (Ith)	For ambient temperature ≤ 50 °C	A	10	
Frequency of the operational current		Hz	Up to 400	
Minimum switching capacity	U min	V	17	
	I min	mA	5	
Short-circuit protection	Conforming to IEC 60947, gG fuse	A	10	
Rated making capacity	Conforming to IEC 60947	I rms	A	110
Short-time rating	Permissible for	1 s	A	80
		500 ms	A	90
		100 ms	A	110
Insulation resistance		MΩ	> 10	
Non-overlap distance	LA1K: linked contacts conforming to INRS, BIA and CNA specifications	mm	0.5 (see schemes pages B8/96 and B8/98)	

Power broken in VA



Power broken in W



#### Operational power of contacts conforming to IEC 60947 a.c. supply, category AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current ( $\cos \phi 0.7$ ) = 10 times the power broken ( $\cos \phi 0.4$ ).

Operating cycles	V	24	48	110/127	220/230	380/400	440	600/690
1 million operating cycles	VA	48	96	240	440	800	880	1200
3 million operating cycles	VA	17	34	86	158	288	317	500
10 million operating cycles	VA	7	14	36	66	120	132	200
Occasional making capacity	VA	1000	2050	5000	10000	14000	13000	9000

#### d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

Operating cycles	V	24	48	110	220	440	600
1 million operating cycles	W	120	80	60	52	51	50
3 million operating cycles	W	55	38	30	28	26	25
10 million operating cycles	W	15	11	9	8	7	6
Occasional making capacity	W	720	600	400	300	230	200

- Breaking limit of contacts valid for:
  - maximum of 50 operating cycles at 10 s intervals (power broken = making current  $\times \cos \phi 0.7$ ).
- Electrical durability of contacts for:
  - 1 million operating cycles (2a)
  - 3 million operating cycles (2b)
  - 10 million operating cycles (2c).
- Breaking limit of contacts valid for:
  - maximum of 20 operating cycles at 10 s intervals with current passing for 0.5 s per operating cycle.
- Thermal limit.



# TeSys

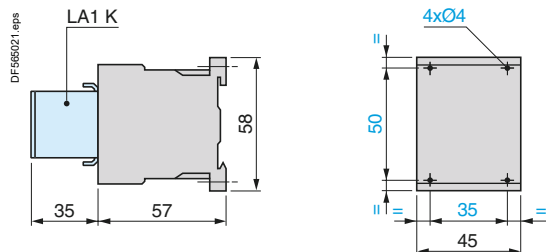
## TeSys K Contactors

### Dimensions and mounting

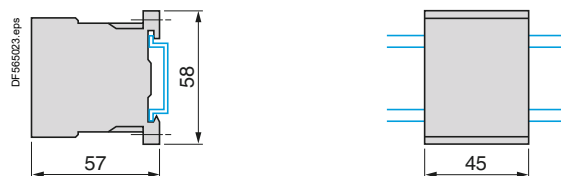
#### Contactors

##### LC1K, LC7K, LP1K, LP4K

On panel

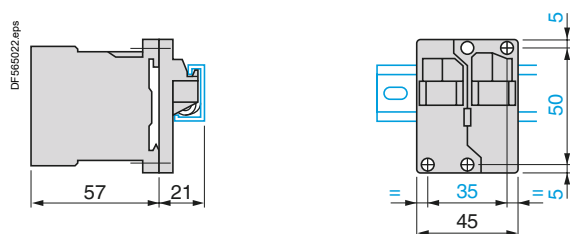


On mounting rail NSYSDR200BD or NSYSDR200 (L<sub>min</sub> 35 mm)

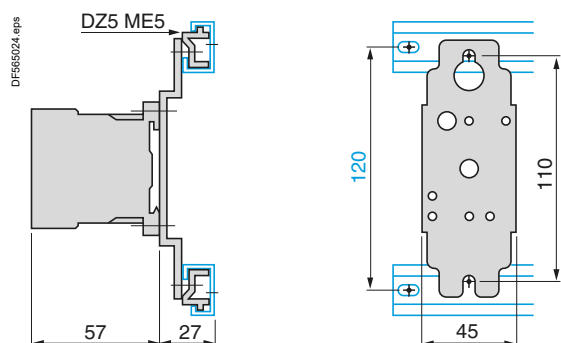


##### LA9D973

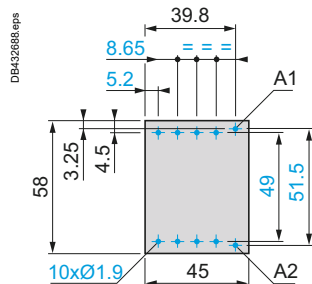
On one asymmetrical rail DZ5MB with clip-on mounting plates



##### DX1AP25



On printed circuit board

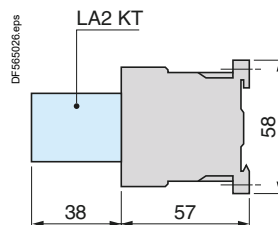


#### Electronic time delay contact blocks

##### LA2KT



On contactor

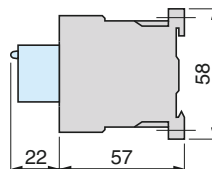


#### Suppressor modules

##### LA4K



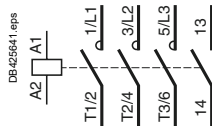
On contactor LC1K or LP1K



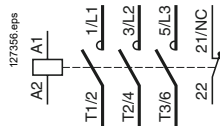


### 3-pole contactors

3 P + N/O

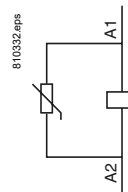


3 P + N/C

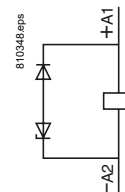


### With integral suppression device

LC7K

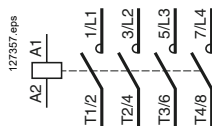


LP4K

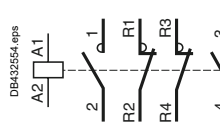


### 4-pole contactors

4 P

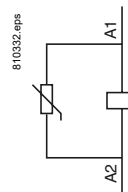


2 P N/O + 2 P N/C

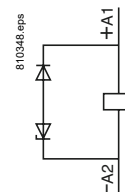


### With integral suppression device

LC7K



LP4K



### Instantaneous auxiliary contacts LA1K

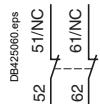
LA1KN20, KN207, KN203

2 N/O



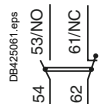
LA1KN02, KN027, KN023

2 N/C



LA1KN11, KN117, KN113

1 N/O + 1 N/C



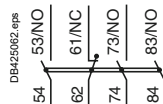
LA1KN40, KN407, KN403

4 N/O



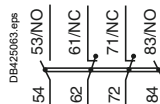
LA1KN31, KN317, KN313

3 N/O + 1 N/C



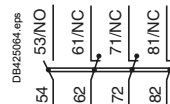
LA1KN22, KN227, KN223

2 N/O + 2 N/C



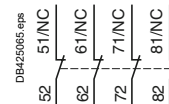
LA1KN13, KN137, KN133

1 N/O + 3 N/C



LA1KN04, KN047, KN043

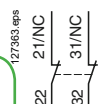
4 N/C



### Terminal referencing conforming to standard EN 50012

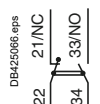
LA1KN02M

2 N/C



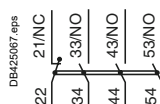
LA1KN11M

1 N/O + 1 N/C



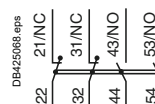
LA1KN31M

3 N/O + 1 N/C



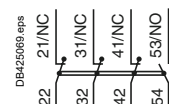
LA1KN22M

2 N/O + 2 N/C



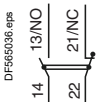
LA1KN13M

1 N/O + 3 N/C



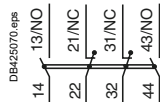
LA1KN11P

1 N/O + 1 N/C



LA1KN22P

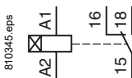
2 N/O + 2 N/C



### Electronic time delay contact blocks

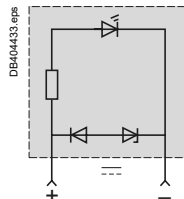
LA2KT

1 C/O

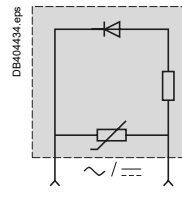


### Suppressor modules

LA4KC



LA4KE





# TeSys

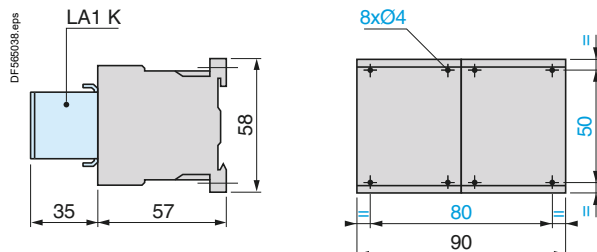
## TeSys K Reversing contactors

### Dimensions and mounting

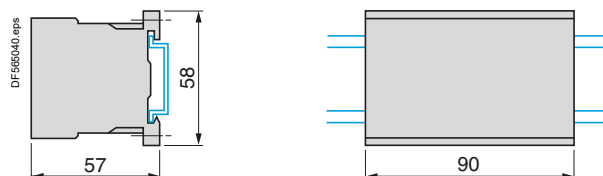
#### Reversing contactors

LC2K, LC8K, LP2K, LP5K

On panel

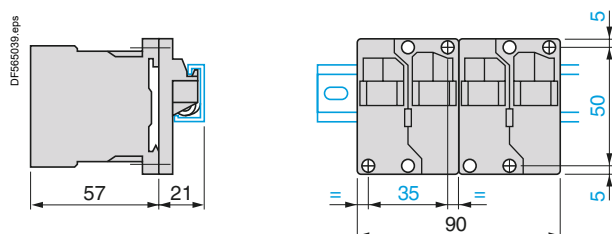


On mounting rail NSYSDR200BD or NSYSDR200 (≥ 35 mm)

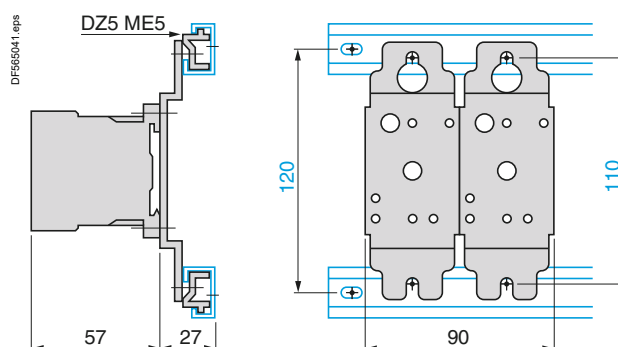


#### 2 x LA9D973

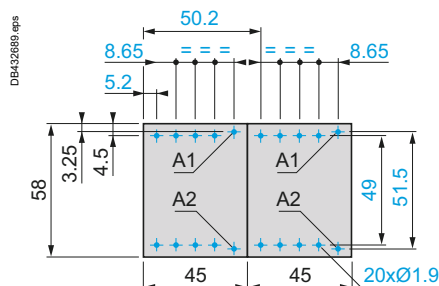
On one asymmetrical mounting rail DZ5MB with 2 clip-on mounting plates LA9D973 or on 2 mounting plates DX1AP25.



#### 2 x DX1AP25



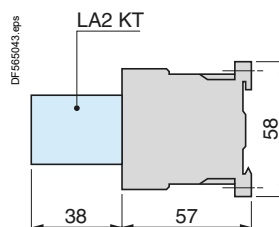
On printed circuit board for reversing contactors or 2 contactors mounted side by side.



#### Electronic time delay contact blocks

LA2KT

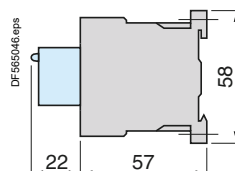
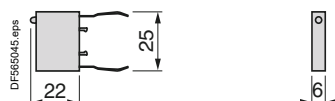
On reversing contactors



#### Suppressor modules

LA4K●

On reversing contactors LC2K or LP2 K





# TeSys

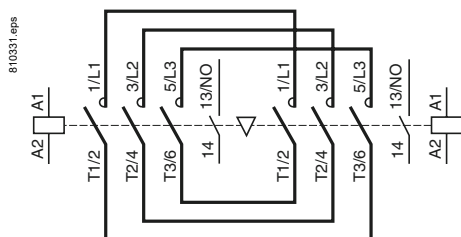
## TeSys K Reversing contactors

### Schemes

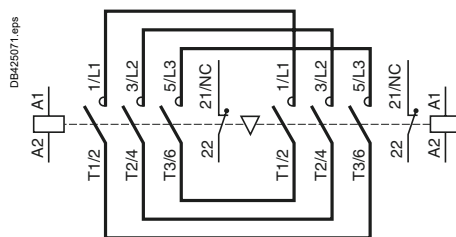
#### 3-pole reversing contactors

With screw clamp connections

3 P + N/O



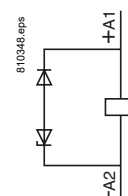
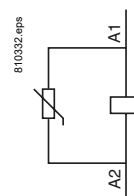
3 P + N/C



With integral suppression device

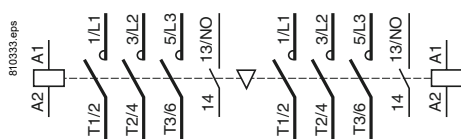
LC8K

LP5K

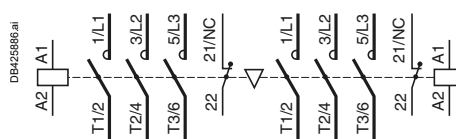


With Faston connectors or solder pins (printed circuit board)

3 P + N/O



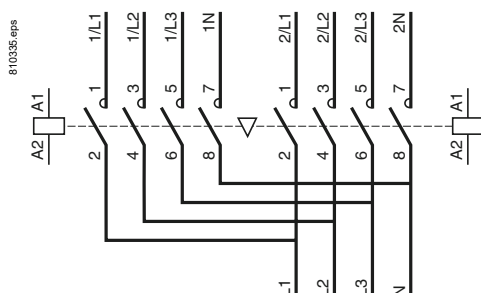
3 P + N/C



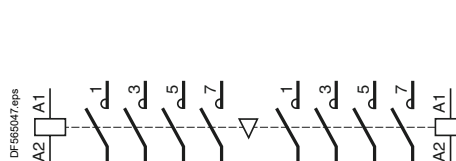
#### 4-pole reversing contactors

With screw clamp connections

4 P



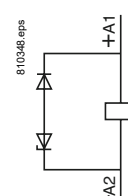
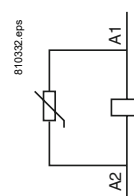
4 P



Integral suppression device

LC8K

LP5K



#### Instantaneous auxiliary contacts LA1K

Terminal referencing conforming to standard EN 50012

LA1KN20, KN207, KN203

LA1KN02, KN027, KN023

LA1KN11, KN117, KN113

LAKN02M

LA1KN11M

LA1KN11P

2 N/O

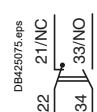
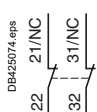
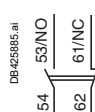
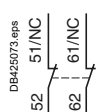
2 N/C

1 N/O + 1 N/C

2 N/C

1 N/O + 1 N/C

1 N/O + 1 N/C



LA1KN40, KN407, KN403

LA1KN31, KN317, KN313

LA1KN22, KN227, KN223

LAKN13, KN137, KN133

LA1KN04, KN047, KN043

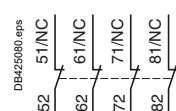
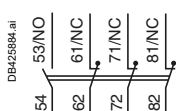
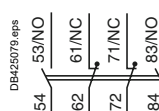
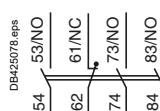
4 N/O

3 N/O + 1 N/C

2 N/O + 2 N/C

1 N/O + 3 N/C

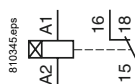
4 N/C



#### Electronic time delay contact blocks

LA2KT

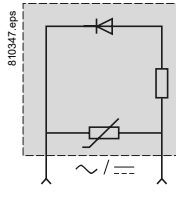
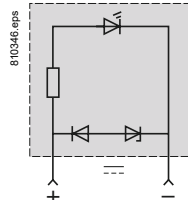
1 C/O



#### Suppressor modules

LA4KC

LA4KE





# TeSys

## TeSys SKGC Mini-contactors

### Characteristics

Environment				
Rated insulation voltage (Ui)	Conforming to IEC 60947	V	690	
Conforming to standards			IEC 60947, UL 60947-4-1, CSA C22.2 n° 60947-4-1	
Approvals			cULus	
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact	
Ambient air temperature around the device	Storage	°C	-50...+70	
	Operation	°C	-20...+50	
Maximum operating altitude	Without derating	m	2000	
Operating position		<div><div><p><b>Vertical axis</b></p><p>Without derating</p></div><div><p><b>Horizontal axis</b></p><p>Without derating</p></div></div>		
Cabling, connectors		Min.	Max.	
	Solid conductor	mm <sup>2</sup>	1 x 1.5 or 2 x 1.5	1 x 6 or 2 x 4
	Flexible cable without cable end	mm <sup>2</sup>	1 x 0.5 or 2 x 0.35	1 x 6 or 2 x 2.5
	Flexible cable with cable end	mm <sup>2</sup>	1 x 0.35 or 2 x 0.35	1 x 6 or 2 x 1.5
Tightening torque	Pozidriv n° 1 head	N.m	0.8	
Terminal referencing			Conforming to standards EN 50005	

Ref.



Contactors



Ref.



Contactors

### Pole characteristics

Mini-contactor type			LC1SKGC2	LC1SKGC3 and LC1SKGC4	
Conventional thermal current (I <sub>th</sub> )	For ambient temperature ≤ 55 °C	A	20	20	
Rated operational frequency		Hz	50/60		
Frequency limit of the operational current		Hz	up to 400		
Rated operational voltage (U <sub>e</sub> )		V	690		
Rated making capacity	I rms conforming to IEC 60947	A	50	85	
Rated breaking capacity (for U <sub>e</sub> ≤ 400 V)	Conforming to IEC 60947 (I rms)	A	40	68	
Permissible short time rating	In free air for a time “t” from cold state (θ ≤ 55 °C)	A	40	60	
Short-circuit protection	gl fuse U ≤ 440 V	A	20	20	
Average impedance per pole	At I <sub>th</sub> and 50 Hz	mΩ	4	4	
Maximum rated operational current	For temperature ≤ 55 °C	AC-3 (U <sub>e</sub> ≤ 400 V)	A	5	9
		AC-1	A	20	20
Use in category AC-1 resistive circuits, heating, lighting (U <sub>e</sub> ≤ 440 V)	Increase in rated operational current by paralleling of 2 poles	A	32	32	

### Auxiliary contact characteristics of mini-contactors

Rated operational voltage (U <sub>e</sub> )	Up to	V	690
Rated insulation voltage (U <sub>i</sub> )	Conforming to IEC 60947	V	690
Conventional thermal current (I <sub>th</sub> )	For ambient temperature ≤ 55 °C	A	10
Frequency of the operational current		Hz	Up to 400
Short-circuit protection	Conforming to IEC 60947, gl fuse	A	10

### Operational power of contacts conforming to IEC 60947

#### a.c. supply, category AC-15

Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4).

	V	24	48	110/127	220/230	380/400	440
1 million operating cycles	VA	48	96	240	440	800	880
3 million operating cycles	VA	17	34	86	158	288	317
10 million operating cycles	VA	7	14	36	66	120	132
Occasional making capacity	VA	1000	2050	5000	10000	14000	13000

#### d.c. supply, category DC-13

Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.

	V	24	48	110	220	440	440
1 million operating cycles	W	120	80	60	52	51	880
3 million operating cycles	W	55	38	30	28	26	317
10 million operating cycles	W	15	11	9	8	7	132
Occasional making capacity	W	720	600	400	300	230	13000



Control circuit characteristics				
Mini-contactor type			LC1SKGC2	LC1SKGC3 and LC1SKGC4
Rated control circuit voltage (Uc)		V	~ 24...400	
Control voltage limits ( $\theta \leq 55\text{ }^{\circ}\text{C}$ )		Operation	0.85...1.1 Uc	
		For drop-out	$\geq 0.20\text{ }U_c$	
Average coil consumption at 20 °C and at Uc				
	Inrush	VA	16	23
	Sealed	VA	4.2	4.9
Heat dissipation		W	1.4	1.5
Operating time at 20 °C and at Uc				
Between coil energisation and	opening of the N/C contacts	ms	8...16	
	closing of the N/O contacts	ms	7...14	
Between coil de-energisation and	opening of the N/O contacts	ms	6...8	
	closing of the N/C contacts	ms	8...10	
Maximum operating rate	In operating cycles per hour		1200	
Mechanical durability at Uc 50/60 Hz coil in millions of operating cycles			10	

Ref.

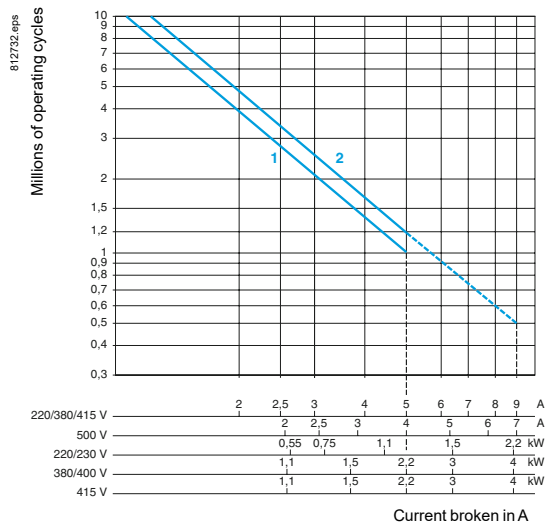


Contactors



### Use in category AC-3 ( $U_e \leq 440 \text{ V}$ )

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.  
The current broken ( $I_c$ ) in category AC-3 is equal to the rated operational current of the motor.

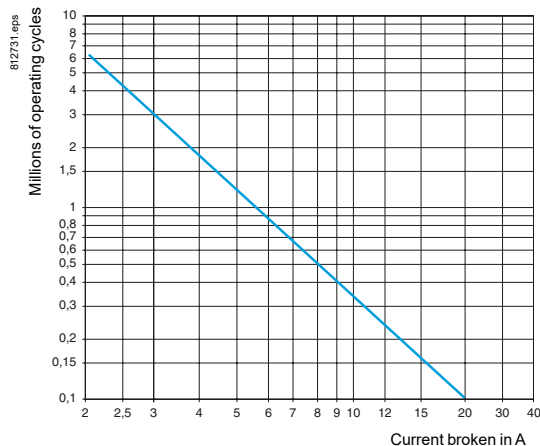


1. LC1SKGC2
  2. LC1SKGC3 and SKGC4
- only up to 415 V

### Use in category AC-1 ( $U_e \leq 440 \text{ V}$ )

Control of resistive circuits ( $\cos \varphi \geq 0.95$ ).

The current broken ( $I_c$ ) in category AC-1 is equal to the current ( $I_e$ ) normally drawn by the load.



Ref.

Contactors



# TeSys

## TeSys SKGC Mini-contactors

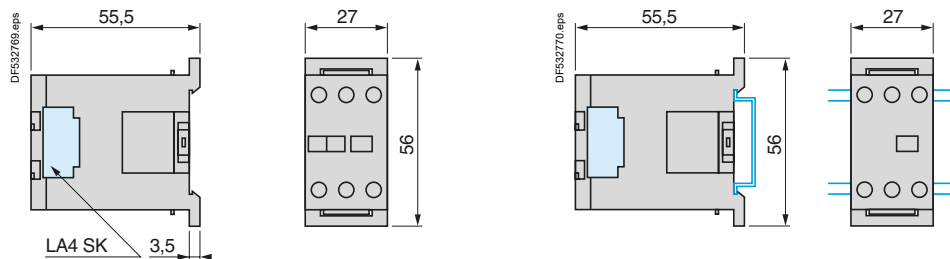
### Dimensions, mounting and schemes

#### Dimensions

Mini-contactors LC1SKGC2

#### Mounting

On mounting rail NSYSR200BD or NSYSR200 (└ 35 mm)



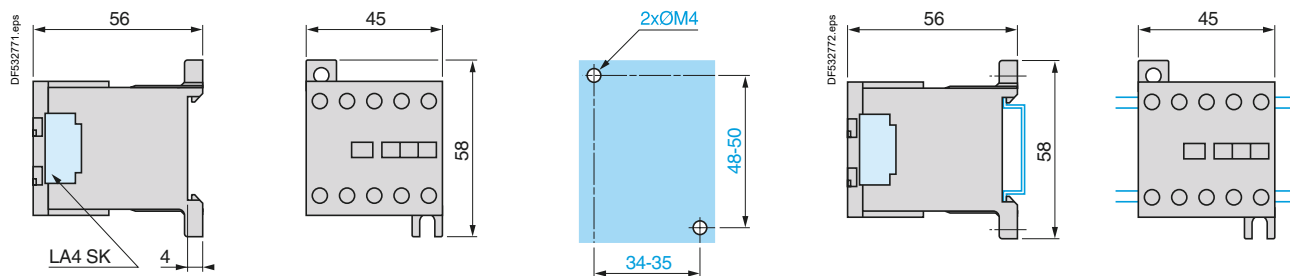
#### Dimensions

Mini-contactors LC1SKGC3 and SKGC4

#### Mounting

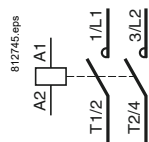
On panel

On mounting rail NSYSR200BD or NSYSR200 (└ 35 mm)



#### 2-pole mini-contactors

LC1SKGC2



#### 3-pole mini-contactors

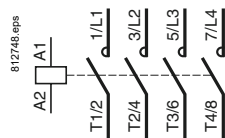
LC1SKGC310

LC1SKGC301



#### 4-pole mini-contactors

LC1SKGC400





# TeSys

## TeSys GC Contactors

### Characteristics



GC25

**TeSys GC contactors are designed for use in modular panels and enclosures.** These contactors feature:

■ **Easy installation:**

- quick clip-on fixing and locking onto 35 mm omega rail
- easy connection by means of ready-to-tighten, captive, pozidrive screw terminals.

■ **Compact size:**

All units have a common depth of 60 mm and width in modules of 17.5 mm (width of one module: 17.5 mm).

■ **User safety:**

- use of materials conforming to strictest fire safety standards
- live parts protected against direct finger contact
- completely safe operation
- state indication on front panel.

## Standards

This range of modular contactors has been designed taking into account the requirements of international standard IEC 61095.

This standard is specific to "Electromagnetic contactors for domestic and similar use".

It has very strict requirements, meeting the expectations of users, with regard to the safety of equipment and persons in "premises and areas accessible to the public".

Conformity with this standard makes it possible to obtain the following quality labels without the need for additional tests: NF-USE, VDE, CEBEC, etc.

## Applications

TeSys GC modular contactors are designed for switching all single-phase, 3-phase or 4-phase loads up to 100 A.

## Power switching

These contactors have multiple applications in industrial, agricultural and commercial premises, hospitals and the home, i.e. wherever switching of a specific supply is required:

- lighting
- heating
- ventilation
- motorised shutters or gates.

Ref.



Contactors



# TeSys

## TeSys GC Contactors

### Characteristics

Environment								
Contactor type			GC16	GC25	GC40	GC63	GC100	
Rated insulation voltage (Ui)	Conforming to IEC 61095	V	500					
	Conforming to VDE 0110	V	500					
Rated impulse withstand voltage (Uimp)		kV	4 in enclosure					
Conforming to standards			IEC 61095 and IEC 60947-5-1 for auxiliary contacts					
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact (IP 20 open, IP 40 in enclosure)					
Ambient air temperature around the device	Storage	°C	-40...+70					
	Operation	°C	-5...+50 (0.85...1.1 Uc)					
Maximum operating altitude	Without derating	m	3000					
Operating positions	Without derating		±30° in relation to normal vertical mounting plane					
Shock resistance 1/2 sine wave = 10 ms	Contactor open		10 gn					
	Contactor closed		15 gn					
Vibration resistance 5...300 Hz	Contactor open		2 gn					
	Contactor closed		3 gn					
Flame resistance			Conforming to IEC 61095					
Pole characteristics								
Number of poles			2, 3 or 4					
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-7a (heating)	A	16	25	40	63	100	
	In AC-7b (motor control)	A	5	8.5	15	25	–	
Contactor rating	40 °C	A	16	25	40	63	100	
	50 °C	A	14	22	36	57	87	
	60 °C <sup>(1)</sup>	A	13	20	32	50	80	
Rated operational voltage (Ue)	Up to	V	250 two-pole contactors, 415 three and four-pole contactors					
Frequency limits	Of the operating current	Hz	400					
Conventional thermal current (Ith)	θ ≤ 50 °C	A	16	25	40	63	100	
Rated breaking and making capacity	Conforming to IEC 61095 (AC-7b) I rms 400 V 3-phase	A	40	68	120	200	–	
Permissible short time rating no current flowing for preceding 15 minutes with q ≤ 40 °C	For 10 s	A	128	200	320	504	800	
	For 30 s	A	40	62	100	157	250	
Short-circuit protection by fuse or circuit breaker U ≤ 440 V	gl fuse	A	16	25	40	63	100	
	Circuit breaker I²t 230 V (at 3 kA rms prospective)	A²s	5000	10000	16000	18000	–	
	400 V	A²s	9000	14000	17500	20000	–	
Electrical durability in operating cycles	AC-7a, AC-7b		100000	100000	100000	100000	30000	
Average impedance per pole	At Ith and 50 Hz	mΩ	2.5	2.5	2	2	1	
Power dissipated per pole	For the above operational currents	W	0.65	1.6	3.2	8	10	
Maximum cabling c.s.a.	Flexible cable without cable end	1 conductor	mm²	6	6	25	25	35
		2 conductors	mm²	4	4	16	16	–
	Flexible cable with cable end	1 conductor	mm²	6	6	16	16	35
		2 conductors	mm²	1.5	1.5	4	4	–
	Solid cable without cable end	1 conductor	mm²	6	6	25	25	35
		2 conductors	mm²	4	4	6	6	10
Tightening torque	Power circuit connections	N.m	0.8	0.8	3.5	3.5	3.5	

(1) Ventilation 1/2 module must be fitted.



# TeSys

## TeSys GC Contactors

### Characteristics

Control circuit characteristics													
Contactor type				GC16, GC25 single or 2-pole		GC16, GC25 3 or 4-pole GC40, GC63 2-pole		GC40, GC63 3 or 4-pole GC100 2-pole		GC100 4-pole			
Rated control circuit voltage (Uc)		50 or 60 Hz		V		12...240 V, for other voltages, please consult your Regional Sales Office							
Control voltage limits (θ ≤ 50 °C)	50 Hz coils	Operational				0.85... 1.1 Uc							
		Drop-out				0.2...0.75 Uc							
Average coil consumption at 20 °C and at Uc	~ 50 Hz	Inrush		VA		15		34		53		106	
		Sealed		VA		3.8		4.6		6.5		13	
Maximum heat dissipation		50/60 Hz		W		1.3		1.6		2.1		4.2	
Operating time		Closing “C”		ms		10...30							
		Opening “O”		ms		10...25							
Mechanical durability		In operating cycles				10 <sup>6</sup>							
Maximum operating rate at ambient temperature ≤ 50 °C		In operating cycles per hour				300							
Maximum cabling c.s.a.	Flexible cable without cable end	1 or 2 conductors		mm²		2.5							
	Flexible cable with cable end	1 conductor		mm²		2.5							
		2 conductors		mm²		1.5							
	Solid cable without cable end	1 or 2 conductors		mm²		1.5							
Tightening torque				N.m		0.8							
Instantaneous auxiliary contact characteristics													
Rated operational voltage (Ue)		Up to		V		250							
Rated insulation voltage (Ui)		Conforming to IEC 60947-5		V		500							
		Conforming to VDE 0110		V		500							
Conventional thermal current (Ith)		For ambient θ ≤ 50 °C		A		5							
Mechanical durability		Operating cycles				10 <sup>6</sup>							
Maximum cabling c.s.a.		Flexible or solid conductor		mm²		2.5							
Tightening torque				N.m		0.8							

Ref.



Contactors

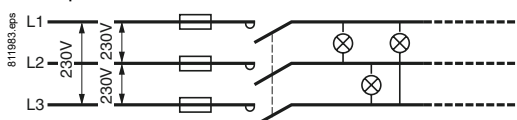


**Lighting** (Maximum number of lamps depending on the power of each unit) Introduction of installations according to type of supply

■ Single-phase circuit, 230 V

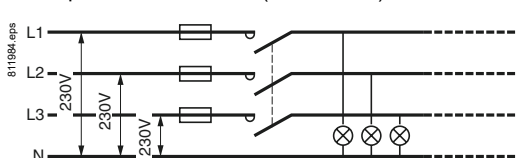


■ 3-phase circuit, 230 V



The maximum number of lamps which can be operated per phase is equal to the number of lamps in the "single phase 230 V" table divided by  $\sqrt{3}$ .

■ 3-phase circuit, 400 V (with neutral)



The maximum number of lamps which can be operated per phase is equal to the total number of lamps in the "single-phase 230 V" table.

**Contactor rating for a single-phase 230 V circuit (single-pole)**

**Fluorescent lamps with starter**

Single fitting	Non corrected					With parallel correction					Contactor rating
P (W)	20	40	50	80	110	20	40	58	80	110	—
I <sub>B</sub> (A)	0.39	0.43	0.70	0.80	1.2	0.19	0.29	0.46	0.57	0.79	—
C (μF)	—	—	—	—	—	5	5	7	7	16	—
Maximum number of lamps	22	20	13	10	7	15	15	10	10	5	<b>16 A</b>
	30	28	17	15	10	20	20	15	15	7	<b>25 A</b>
	70	60	35	30	20	40	40	30	30	14	<b>40 A</b>
	100	90	56	48	32	60	60	43	43	20	<b>63 A</b>
Twin fitting	Non corrected					With series correction					Contactor rating
P (W)	2 x 18	2 x 36	2 x 58	2 x 80	2 x 140	2 x 18	2 x 36	2 x 58	2 x 80	2 x 140	—
I <sub>B</sub> (A)	0.44	0.82	1.34	1.64	2.2	0.26	0.48	0.78	0.96	1.3	—
C (μF)	—	—	—	—	—	3.5	4.5	7	9	18	—
Maximum number of lamps	20	11	7	5	4	30	17	10	9	6	<b>16 A</b>
	30	16	10	8	6	46	25	16	13	10	<b>25 A</b>
	50	26	16	13	10	80	43	27	22	16	<b>40 A</b>
	75	42	25	21	16	123	67	42	34	25	<b>63 A</b>

**High pressure mercury vapour lamps**

	Non corrected						With parallel correction								Contactor rating
P (W)	50	80	125	250	400	700	50	80	125	250	400	700	1000	—	
I <sub>B</sub> (A)	0.6	0.8	1.15	2.15	3.25	5.4	0.35	0.50	0.7	1.5	2.4	4	5.7	—	
C (μF)	—	—	—	—	—	—	7	8	10	18	25	40	60	—	
Maximum number of lamps	15	10	8	4	2	1	10	9	9	4	3	2	—	16 A	
	20	15	10	6	4	2	15	13	10	6	4	2	1	25 A	
	34	27	20	10	6	4	28	25	20	11	8	5	3	40 A	
	53	40	28	15	10	6	43	38	30	17	12	7	5	63 A	

I<sub>B</sub>: value of current drawn by each lamp at its rated voltage.

C: unit capacitance for each lamp.

I<sub>B</sub> and C correspond to values normally quoted by lamp manufacturers



Ref.



Contactors

Contactor rating for a single-phase 230 V circuit (single-pole) (continued)													
Low pressure sodium vapour lamps													
	Non corrected						With parallel correction						Contactor rating
P (W)	18	35	55	90	135	180	18	35	55	90	135	180	–
I <sub>B</sub> (A)	0.35	1.4	1.4	2.1	3.1	3.1	0.35	0.6	0.6	0.9	0.9	0.9	–
C (µF)	–	–	–	–	–	–	5	20	20	26	45	40	–
Maximum number of lamps	18	4	5	3	2	2	14	3	3	2	1	1	16 A
	34	9	9	6	4	4	21	5	5	4	2	2	25 A
	57	14	14	9	6	6	40	10	10	8	4	5	40 A
	91	24	24	19	10	10	60	15	15	11	6	7	63 A
High pressure sodium vapour lamps													
	Non corrected						With parallel correction						Contactor rating
P (W)	70	150	250	400	1000		70	150	250	400	1000		–
I <sub>B</sub> (A)	1	1.8	3	4.4	10.3		0.6	0.7	1.5	2.5	6		–
C (µF)	–	–	–	–	–		12	20	32	45	100		–
Maximum number of lamps	8	4	2	1	–		6	6	2	2	1		16 A
	12	7	4	3	1		9	9	3	4	2		25 A
	20	13	8	5	2		18	18	6	8	4		40 A
	32	18	11	8	3		25	25	9	12	6		63 A
Metal iodine or halogen vapour lamps													
	Non corrected						With parallel correction						Contactor rating
P (W)	35	70	150	250	400	1000	39	70	150	250	400	1000 2000	–
I <sub>B</sub> (A)	0.3	0.5	1	1.5	2.5	6	0.3	0.5	1	1.5	2.5	6 5.5	–
C (µF)	–	–	–	–	–	–	6	12	20	32	45	85 60	–
Maximum number of lamps	27	16	8	5	3	1	12	6	4	3	2	– 1	16 A
	40	24	12	8	5	2	18	9	6	4	3	1 2	25 A
	68	42	20	14	8	4	31	16	10	7	5	3 3	40 A
	106	64	32	21	13	5	50	25	15	10	7	4 5	63 A
Incandescent and halogen lamps													
													Contactor rating
P (W)	60	75	100	150	200	300	500	1000					–
I <sub>B</sub> (A)	0.26	0.32	0.44	0.65	0.87	1.3	2.17	4.4					–
Maximum number of lamps	30	25	19	12	10	7	4	2					16 A
	45	38	28	18	14	10	6	3					25 A
	85	70	50	35	26	18	10	6					40 A
	125	100	73	50	37	25	15	8					63 A
Halogen lamps used with transformer													
													Contactor rating
P (W)	60	80	105	150									–
I <sub>B</sub> (A)	0.26	0.35	0.45	0.65									–
Maximum number of lamps	9	8	6	4									16 A
	14	12	9	6									25 A
	27	23	18	13									40 A
	40	35	27	19									63 A

I<sub>B</sub>: value of current drawn by each lamp at its rated voltage.

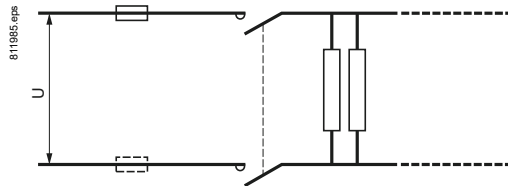
C: unit capacitance for each lamp.

I<sub>B</sub> and C correspond to values normally quoted by lamp manufacturers

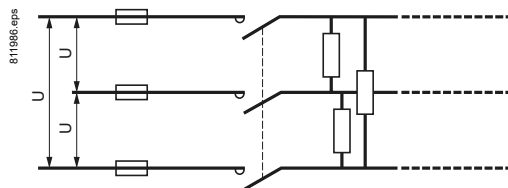


Heating (AC-7a)

Single-phase, 2-pole switching



3-phase switching



Heating by resistive elements or by infra-red radiators, convectors or radiators, heating ducts, industrial furnaces. The current peak between the hot and cold states must not exceed 2 to 3 In at the moment of switch-on.

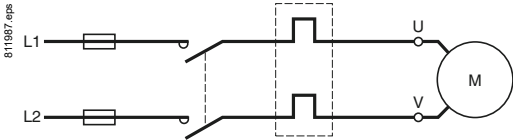
Contactor selection according to power and required electrical life

Electrical durability (in operating cycles)	Maximum power (kW)					Contactor rating
	100 x 10 <sup>3</sup>	150 x 10 <sup>3</sup>	200 x 10 <sup>3</sup>	500 x 10 <sup>3</sup>	10 <sup>6</sup>	
Single-phase switching 230 V (2-pole)	3.5	3	2.2	1	0.8	16 A
	5.4	4.6	3.5	1.6	1.2	25 A
	8.6	7.4	5.6	2.6	1.9	40 A
	13.6	11.6	8.8	4	3	63 A
	21.6	18.4	14	6.4	4.8	100 A
3-phase switching 400 V (3-pole)	10	9	6.5	3.2	2.2	16 A
	16	14	10	5	3.5	25 A
	26	22	17	7.5	6	40 A
	41	35	26.5	12	9	63 A
	64.8	55.2	42	19.2	14.4	100 A

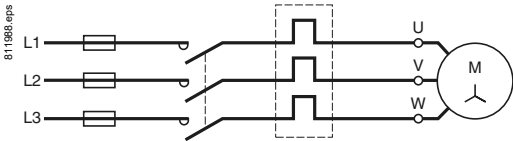


Motor control (AC-7b)

Single-phase circuit, 230 V



3-phase circuit, 400 V



Contactor selection according to maximum power in kW

230 V single-phase capacitor motor (2-pole)	400 V 3-phase motor	Contactor rating (Ith)
0.55	2.2	16 A
1.1	4	25 A
2.2	7.5	40 A
4	11	63 A

Ref.





# TeSys

## TeSys GC Contactors

### Dimensions

#### Dimensions

##### Contactors

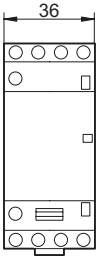
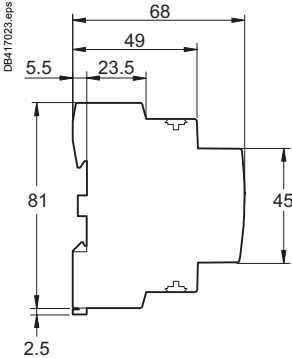
##### Common side view

**GC1610, 1611, 1620**  
**GC2502, 2510, 2511, 2520**

1 module

**GC1622, 1640**  
**GC2504, 2522, 2530, 2540**

2 modules



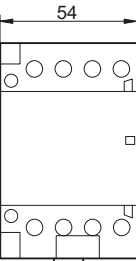
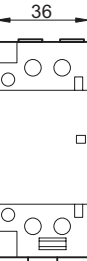
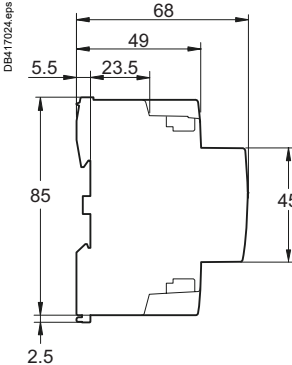
##### Common side view

**GC4002, 4011, 4020**  
**GC6302, 6311, 6320**

2 modules

**GC4004, 4022, 4030, 4040**  
**GC6304, 6322, 6330, 6340**

3 modules



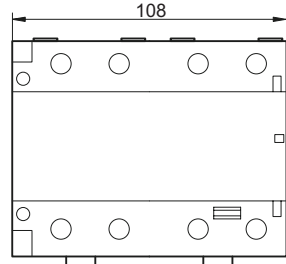
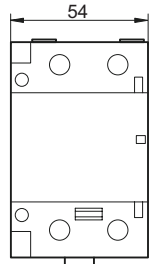
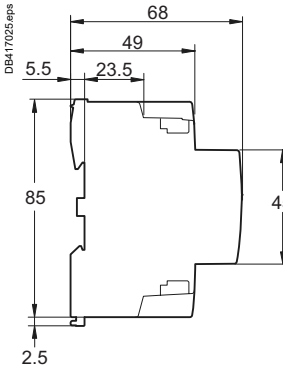
##### Common side view

**GC10020**

3 modules

**GC10040**

6 modules



Ref.



Contactors



# TeSys

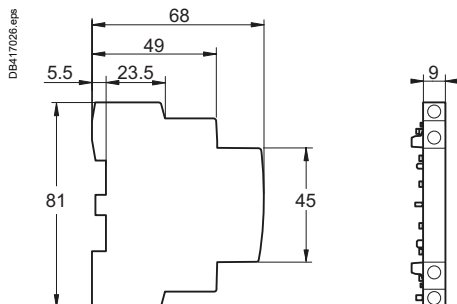
## TeSys GC Contactors

### Dimensions and mounting

#### Dimensions

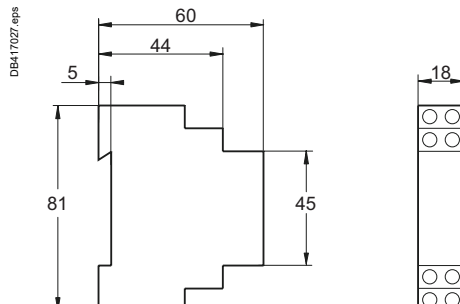
##### Auxiliary contacts

GAC0511, 0531 and 0521



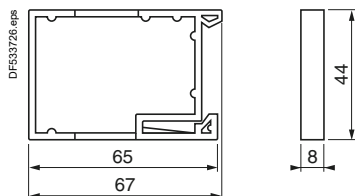
##### Coil suppression blocks

GAP21 and 23



#### Clip-on ventilation 1/2 module

GAC5

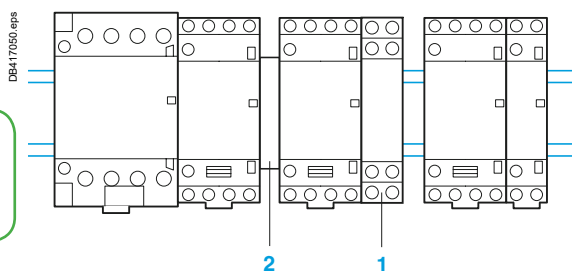


Ref.

#### Mounting

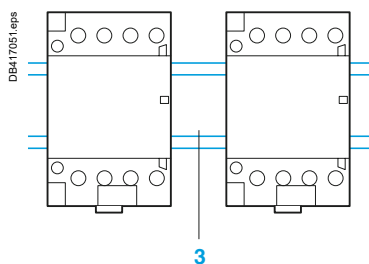
##### Setting-up precautions

The contactor controls must be bounce free. If not, connect a coil suppression block **1** (GAP21 or 23) across the coil terminals y 250 V. When several contactors which operate at the same time are mounted side by side, a GAC 5 ventilation 1/2 module **2** must be fitted every 2 contactors.



Contactor

It is advisable to mount electronic units at the bottom of the modular panel and to separate them from electromechanical units by a space **3** equal to one module, or by 2 ventilation 1/2 modules (GAC 5).

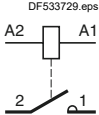




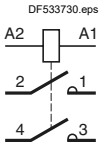
Schemes

Contactors

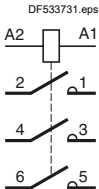
GC••10



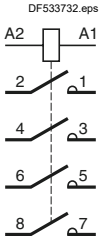
GC••20



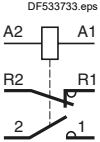
GC••30



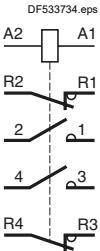
GC••40



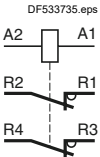
GC••11



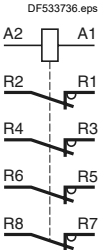
GC••22



GC••02

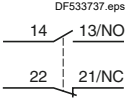


GC••04

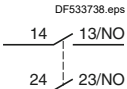


Auxiliary contacts

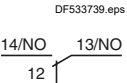
GAC0521



GAC0531



GAC0511





# TeSys

## TeSys GY "Dual tariff" contactors

### Characteristics



TeSys GY "dual tariff" contactors are designed for use in modular panels and enclosures.

These contactors feature:

■ **Easy installation:**

- quick clip-on fixing and locking onto 35 mm omega rail
- easy connection by means of ready-to-tighten captive, pozidrive screw terminals.

■ **Compact size**

All units have a common depth of 60 mm and width in modules of 17.5 mm (width of one module: 17.5 mm).

■ **User safety:**

- use of materials conforming to strictest fire safety standards
- live parts protected against direct finger contact
- completely safe operation
- state indication on front panel.

"Dual tariff" contactors are designed for use with Electricity Supply Authority dual tariffs.

They have a 4-position selector switch on the front panel:

<b>"Stop" (O)</b>	For switching off the load, e.g. for prolonged periods of absence.
<b>"Off peak" Automatic start (A)</b>	The contactor switches automatically during "off peak" hours as set by the Supply Authority remote control and thus supplies the load, (washing machine, dishwasher, convector heater, water heater) during this period, at an economy rate to the user.
<b>"Peak time" Manual start (I)</b>	In this position, the contactor supplies the load to cater for additional requirements for hot water, heating, etc., but at the standard rate. The contactor returns automatically to the "off-peak" position at the start of the "off-peak" period.
<b>"Peak time" Manual override with lock</b>	Facility for setting the contactor to continuous manual operation, ignoring the automation system and the Supply Authority control; setting and locking is achieved by means of a tool, with manual return to the "AUTO" position.

### Standards

This range of modular contactors has been designed taking into account the requirements of international standard IEC 61095.

This standard is specific to "Electromagnetic contactors for domestic and similar use".

It has very strict requirements, meeting the expectations of users, with regard to the safety of equipment and persons in "premises and areas accessible to the public". Conformity with this standard makes it possible to obtain the following quality labels without the need for additional tests: NF-USE, VDE, CEBEC, etc.

"Dual tariff" modular contactors are designed for switching all single-phase, 3-phase or 4-phase loads up to 63 A.

TeSys GY contactors have multiple applications in industrial, agricultural and commercial premises, hospitals and the home, i.e. wherever switching of a specific supply is required:

- lighting,
- heating, ventilation,
- motorised shutters or gates.

Ref.

Contactors



# TeSys

## TeSys GY "Dual tariff" contactors

### Characteristics

Environment						
Type			GY16	GY25	GY40	GY63
Rated insulation voltage (Ui)	Conforming to IEC 61095	V	500			
	Conforming to VDE 0110	V	500			
Rated impulse withstand voltage (Uimp)		kV	4 in enclosure			
Conforming to standards			IEC 61095 and IEC 60947-5-1 for auxiliary contacts			
Product certifications			NF-USE, VDE, CEBEC, ÖVE			
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 20 open, IP 40 in enclosure			
Ambient air temperature around the device	Storage	°C	-40...+70			
	Operation	°C	-5...+50 (0.85...1.1 Uc)			
Maximum operating altitude	Without derating	m	3000			
Operating positions	Without derating		±30° in relation to normal vertical mounting plane			
Shock resistance 1/2 sine wave = 11 ms	Contact open		10 gn			
	Contact closed		15 gn			
Vibration resistance 5...300 Hz	Contact open		2 gn			
	Contact closed		3 gn			
Flame resistance			Conforming to IEC 61095			
Pole characteristics						
Number of poles			2, 3 or 4			
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-7a (heating)	A	16	25	40	63
	In AC-7b (motor control)	A	5	8.5	15	25
Contactor rating	40 °C		16	25	40	63
	50 °C		14	22	36	57
	60 °C <sup>(1)</sup>		13	20	32	50
Rated operational voltage (Ue)	Up to	V	250 - 2-pole contactors, 415 - 3 and 4-pole contactors			
Frequency limits	Of the operating current	Hz	400			
Conventional thermal current (Ith)	θ ≤ 50 °C	A	16	25	40	63
Rated breaking and making capacity	Conforming to IEC 61095 (AC-7b) I rms 400 V 3-phase	A	40	68	120	200
Short time rating with no current flow for the previous 15 minutes with θ ≤ 40 °C	For 10 s	A	128	200	320	504
	For 30 s	A	40	62	100	157
Short-circuit protection by fuse or circuit breaker U ≤ 440 V						
	gl fuse	A	16	25	40	63
Circuit breaker I²t (at 3 kA rms prospective)	230V	A²s	5000	10000	16000	18000
	400V	A²s	9000	14000	17500	20000
Electrical durability in operating cycles	AC-7a, AC-7b		100000	100000	100000	100000
Average impedance per pole	At Ith and 50 Hz	mΩ	2.5	2.5	2	2
Power dissipated per pole	For the above operational currents	W	0.65	1.6	3.2	8
Maximum cabling c.s.a.						
Flexible cable without cable end	1 conductor	mm²	6	6	25	25
	2 conductors	mm²	4	4	16	16
Flexible cable with cable end	1 conductor	mm²	6	6	16	16
	2 conductors	mm²	1.5	1.5	4	4
Solid cable without cable end	1 conductor	mm²	6	6	25	25
	2 conductors	mm²	4	4	6	6
Tightening torque	Power circuit connections	N.m	0.8	0.8	3.5	3.5

(1) Ventilation 1/2 module must be fitted.



# TeSys

## TeSys GY "Dual tariff" contactors

### Characteristics

Control circuit characteristics					
Type			GY16, GY25 single or 2-pole	GY16, GY25 3 or 4-pole	GY40, GY63 3 or 4-pole
				GY40, GY63 2-pole	
Rated control circuit voltage (Uc)	50 or 60 Hz	V	12...240 V, for other voltages, please consult your Regional Sales Office		
Control voltage limits (θ ≤ 50 °C) 50 Hz coils	Operational		0.85...1.1 Uc		
	Drop-out		0.2...0.75 Uc		
Average consumption at 20 °C and at Uc ~ 50 Hz	Inrush	VA	15	34	53
	Sealed	VA	3.8	4.6	6.5
Heat dissipation	50/60 Hz	W	1.3	1.6	2.1
Operating time	Closing "C"	ms	10 ... 30		
	Opening "O"	ms	10 ... 25		
Mechanical durability	In operating cycles		10 <sup>6</sup>		
Maximum operating rate at ambient temperature ≤ 50 °C	In operating cycles per hour		300		
Maximum cabling c.s.a.					
Flexible cable without cable end	1 or 2 conductors	mm <sup>2</sup>	2.5		
	1 conductor	mm <sup>2</sup>	2.5		
Flexible cable with cable end	2 conductors	mm <sup>2</sup>	1.5		
	1 or 2 conductors	mm <sup>2</sup>	1.5		
Solid cable without cable end	1 or 2 conductors	mm <sup>2</sup>	1.5		
Tightening torque		N.m	0.8		
Instantaneous auxiliary contact characteristics					
Rated operational voltage (Ue)	Up to	V	250		
Rated insulation voltage (Ui)	Conforming to IEC 60947-5	V	500		
	Conforming to VDE 0110	V	500		
Conventional thermal current (Ith)	For ambient θ ≤ 50 °C	A	5		
Mechanical durability	In operating cycles		10 <sup>6</sup>		
Maximum cabling c.s.a.	Flexible or solid conductor	mm <sup>2</sup>	2.5		
Tightening torque		N.m	0.8		

Ref.

Contactors



# TeSys

## TeSys GY “Dual tariff” contactors

### Dimensions

#### Dimensions

##### "Dual tariff" contactors

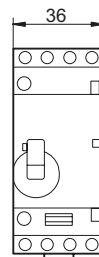
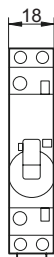
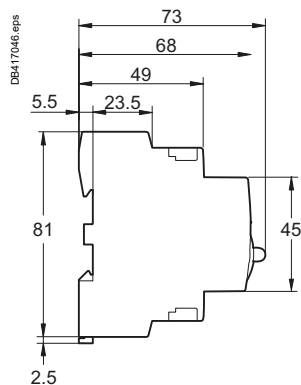
###### Common side view

**GY1620  
GY2520**

1 module

**GY2530, 2540**

2 modules



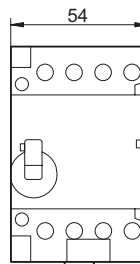
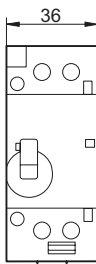
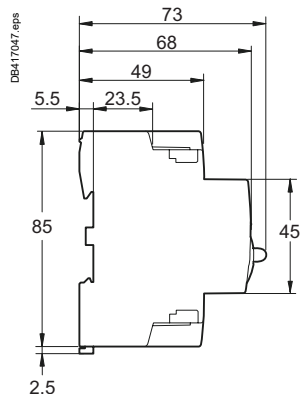
###### Common side view

**GY4020  
GY6320**

2 modules

**GY4030, 4040  
GY6330, 6340**

3 modules

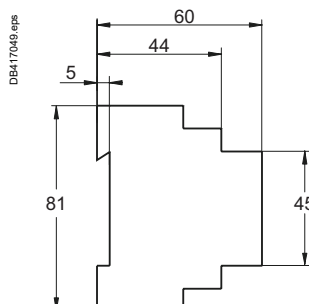
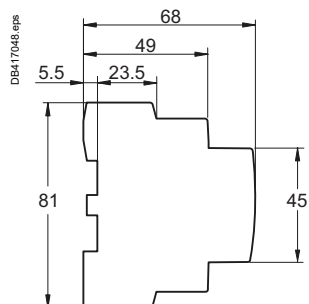


##### Auxiliary contacts

**GAC0511, 0531 and 0521**

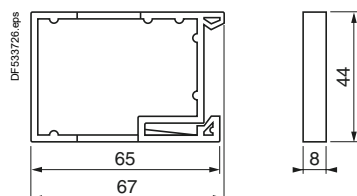
##### Coil suppression block

**GAP21 and 23**



##### Clip-on ventilation 1/2 module

**GAC5**



References:  
page B8/54

Characteristics:  
pages B8/114 to B8/116

Ref.



Contactors

Life Is On

**Schneider**  
Electric

**B8/117**



# TeSys

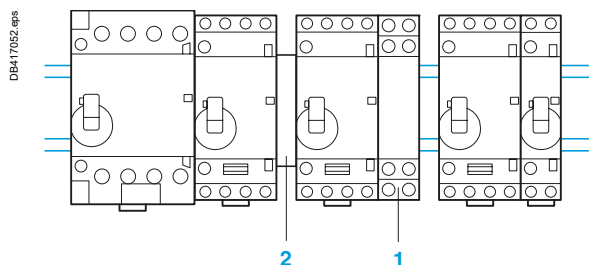
## TeSys GY “Dual tariff” contactors

### Mounting and schemes

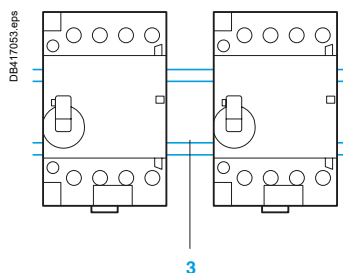
#### Mounting

##### Setting-up precautions

The contactor controls must be bounce free. If not, connect a coil suppression block **1** (GAP 21 or 23) across the coil terminals  $\leq 250$  V. When several contactors which operate at the same time are mounted side by side, a GAC5 ventilation 1/2 module **2** must be fitted every 2 contactors.



It is advisable to mount electronic units at the bottom of the modular panel and to separate them from electromechanical units by a space equal to one module **3** or by 2 ventilation 1/2 modules GAC5.



Ref.



#### Schemes

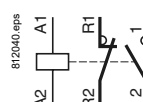
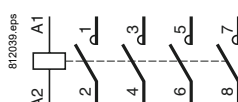
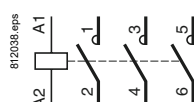
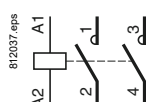
##### Contactors

GY●●20

GY●●30

GY●●40

GY●●11

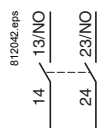
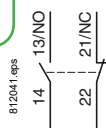


##### Auxiliary contacts

GAC0521

GAC0531

GAC0511



Contactors



# TeSys

## TeSys GF Impulse relay

### Characteristics



GF1611M7

**TeSys GF impulse relays are designed for use in modular enclosures.**

They feature:

■ **Easy installation:**

- quick clip-on fixing and locking onto 35 mm omega rail
- easy connection by means of ready-to-tighten captive, pozidrive screw terminals.

■ **Compact size**

Units have a common depth of 60 mm and width of 18 mm.

■ **User safety:**

- live parts protected against direct finger contact
- completely safe operation
- state indication on front panel.

## Standards

This range of modular impulse relays has been designed taking into account the requirements of international standard IEC 60669-2.

This standard is specific to "Impulse relays".

Conformity with this standard makes it possible to obtain the following quality labels without the need for additional tests: NF-USE, VDE, CEBEC, etc.

## Functions

Modular impulse relays are designed for opening and closing of circuits which are remotely controlled by impulses. The position is mechanically maintained.

These impulse relays are used in lighting circuits when there are more than two switching points.

## Power switching

TeSys GF impulse relays have multiple applications in industrial, agricultural and commercial premises, hospitals and the home, i.e. wherever switching of a specific lighting supply is required.

Ref.



Contactors



# TeSys

## TeSys GF Impulse relay

### Characteristics

#### Environment

Rated insulation voltage (Ui)	Conforming to IEC 60947-1-5	<b>V</b>	400
	Conforming to VDE 0110	<b>V</b>	400
Rated impulse withstand voltage (Uimp)		<b>kV</b>	4 in enclosure
Conforming to standards			IEC 60669-1 and 60669-2
Product certifications			NF-USE, CEBEC, ASE, KEMA, N, S, D, FI, VDE
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP 20 open, IP 40 in enclosure
Ambient air temperature around the device	Storage	<b>°C</b>	-40...+80
	Operation	<b>°C</b>	-20...+50
Maximum operating altitude	Without derating	<b>m</b>	2000
Operating positions	Without derating		±90° in relation to normal vertical mounting plane
Shock resistance 1/2 sine wave = 10 ms	Impulse relay open		Please consult your Regional Sales Office
	Impulse relay closed		Please consult your Regional Sales Office
Vibration resistance 5...300 Hz	Impulse relay open		4 gn
	Impulse relay closed		4 gn

Ref.

#### Pole characteristics

Number of poles				1 or 2	
Rated operational current (Ie) (Ue ≤ 250 V)		In AC-7a (heating)	<b>A</b>	16	
Rated operational voltage			<b>V</b>	250	
Conventional thermal current (Ith)		θ ≤ 50 °C	<b>A</b>	16	
Permissible short time rating no current flowing for preceding 15 minutes with θ ≤ 40 °C	For 1 s		<b>A</b>	320	
	For 10 s		<b>A</b>	96	
	For 30 s		<b>A</b>	48	
Short-circuit protection by fuse or circuit breaker	gl fuse		<b>A</b>	16	
	Circuit breaker I²t (at 3 kA rms prospective)		<b>A²s</b>	5000	
Average impedance per pole		At Ith and 50 Hz	<b>mΩ</b>	4	
Power dissipated per pole			<b>W</b>	1	
Maximum cabling c.s.a.	Flexible cable without cable end	1 conductor	<b>mm²</b>	<b>Min.</b>	<b>Max.</b>
			0.5	0.5	6
		2 conductors	<b>mm²</b>	0.5	4
		Flexible cable with cable end	1 conductor	<b>mm²</b>	0.5
	2 conductors		<b>mm²</b>	0.5	4
	Solid cable without cable end	1 conductor	<b>mm²</b>	0.5	6
		2 conductors	<b>mm²</b>	0.5	4
	Tightening torque		Power circuit connections	<b>N.m</b>	0.8

Contactors



# TeSys

## TeSys GF Impulse relay

### Characteristics

Control circuit characteristics			
Rated control circuit voltage (Uc)		V	12...240 V, for other voltages, please consult your Regional Sales Office
Control voltage limits ( $\theta < 50\text{ }^{\circ}\text{C}$ )	Operating threshold, dual frequency 50/60 Hz	V	0.85...1.1 Uc
Average consumption at 20 °C and at Uc	Inrush at 50 Hz	VA	19
Operating time	Closing "C"	ms	70
	Opening "O"	ms	70
Minimum impulse time		ms	70
Mechanical durability			10 <sup>6</sup> operating cycles
Electrical durability	AC-21		200000 operating cycles
	AC-22		100000 operating cycles
Maximum operating rate	Operating cycles per hour		900
Maximum cabling c.s.a.	Flexible cable without cable end	1 or 2 conductors	mm <sup>2</sup> 2.5
	Flexible cable with cable end	1 conductor	mm <sup>2</sup> 2.5
		2 conductors	mm <sup>2</sup> 1.5
	Solid cable without cable end	1 or 2 conductors	mm <sup>2</sup> 1.5
Tightening torque		N.m	0.8

Ref.



Contactors



**Lighting circuits****Fluorescent lamps with starter**

Single fitting	Non corrected			With parallel correction		
Power in W	18	36	58	18	36	58
Number of lamps	70	35	21	50	25	16
Twin fitting	With series correction					
Power in W	2 x 18	2 x 36	2 x 58			
Number of lamps	56	28	17			

**Incandescent lamps: filament lamps**

Power in W	40	60	75	100	200
Number of lamps	40	25	20	16	8

**Incandescent lamps: halogen lamps**

Power in W	300	500	1000	1500
Number of lamps	5	3	1	1

**Incandescent lamps: very low voltage halogen lamps**

Power in W	20	50	75	100
Number of lamps	70	28	19	4

**Low pressure sodium vapour lamps**

	Non corrected			
Power in W	55	90	135	180
Number of lamps	24	15	10	7

**High pressure sodium vapour lamps**

	Non corrected		
Power in W	250	400	1000
Number of lamps	5	3	1

**Heating circuits****Single-phase 230 V, 2-pole**

Power in kW	3.6
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Ref.



Contactors



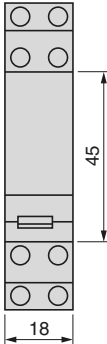
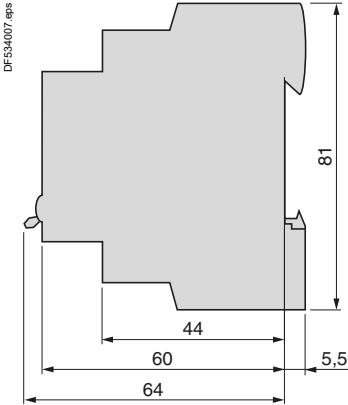
# TeSys

## TeSys GF Impulse relay

### Dimensions and schemes

#### Dimensions

GF1610, GF1611, GF1620

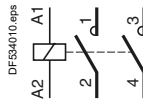
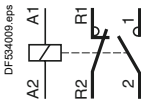
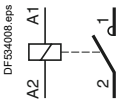


#### Schemes

GF1610

GF1611

GF1620



Ref.



Contactors



## Test conditions according to IEC utilization categories

Contactor characteristics are established following tests and utilization categories whose are conforming IEC 60947-4-1 and 5-1 standards.

Contactors													
Electrical durability: making and breaking conditions								Occasional duty: making and breaking conditions					
a.c. supply													
Typical applications	Utilisation category	Making I      U      cos φ			Breaking I      U      cos φ			Making I      U      cos φ			Breaking I      U      cos φ		
Resistors, non inductive or slightly inductive loads	AC-1	I <sub>e</sub>	U <sub>e</sub>	0.95	I <sub>e</sub>	U <sub>e</sub>	0.95	1.5 I <sub>e</sub>	1.05 U <sub>e</sub>	0.8	1.5 I <sub>e</sub>	1.05 U <sub>e</sub>	0.8
Motors													
Slip ring motors: starting, breaking.	AC-2	2.5 I <sub>e</sub>	U <sub>e</sub>	0.65	2.5 I <sub>e</sub>	U <sub>e</sub>	0.65	4 I <sub>e</sub>	1.05 U <sub>e</sub>	0.65	4 I <sub>e</sub>	1.05 U <sub>e</sub>	0.65
Squirrel cage motors: starting, breaking whilst motor running.	AC-3												
	I <sub>e</sub> ≤ <sup>(1)</sup>	6 I <sub>e</sub>	U <sub>e</sub>	0.65	1 I <sub>e</sub>	0.17 U <sub>e</sub>	0.65	10 I <sub>e</sub>	1.05 U <sub>e</sub>	0.45	8 I <sub>e</sub>	1.05 U <sub>e</sub>	0.45
	I <sub>e</sub> > <sup>(2)</sup>	6 I <sub>e</sub>	U <sub>e</sub>	0.35	1 I <sub>e</sub>	0.17 U <sub>e</sub>	0.35	10 I <sub>e</sub>	1.05 U <sub>e</sub>	0.35	8 I <sub>e</sub>	1.05 U <sub>e</sub>	0.35
Squirrel cage motors: starting, reversing, inching	AC-4												
	I <sub>e</sub> ≤ <sup>(1)</sup>	6 I <sub>e</sub>	U <sub>e</sub>	0.65	6 I <sub>e</sub>	U <sub>e</sub>	0.65	12 I <sub>e</sub>	1.05 U <sub>e</sub>	0.45	10 I <sub>e</sub>	1.05 U <sub>e</sub>	0.45
	I <sub>e</sub> > <sup>(2)</sup>	6 I <sub>e</sub>	U <sub>e</sub>	0.35	6 I <sub>e</sub>	U <sub>e</sub>	0.35	12 I <sub>e</sub>	1.05 U <sub>e</sub>	0.35	10 I <sub>e</sub>	1.05 U <sub>e</sub>	0.35
d.c. supply													
Typical applications	Utilisation category	Making I      U      L/R (ms)			Breaking I      U      L/R (ms)			Making I      U      L/R (ms)			Breaking I      U      L/R (ms)		
Resistors, non inductive or slightly inductive loads	DC-1	I <sub>e</sub>	U <sub>e</sub>	1	I <sub>e</sub>	U <sub>e</sub>	1	1.5 I <sub>e</sub>	1.05 U <sub>e</sub>	1	1.5 I <sub>e</sub>	1.05 U <sub>e</sub>	1
Shunt wound motors: starting, reversing, inching	DC-3	2.5 I <sub>e</sub>	U <sub>e</sub>	2	2.5 I <sub>e</sub>	U <sub>e</sub>	2	4 I <sub>e</sub>	1.05 U <sub>e</sub>	2.5	4 I <sub>e</sub>	1.05 U <sub>e</sub>	2.5
Series wound motors: starting, reversing, inching	DC-5	2.5 I <sub>e</sub>	U <sub>e</sub>	7.5	2.5 I <sub>e</sub>	U <sub>e</sub>	7.5	4 I <sub>e</sub>	1.05 U <sub>e</sub>	15	4 I <sub>e</sub>	1.05 U <sub>e</sub>	15
Control relays and auxiliary contacts													
Electrical durability: making and breaking conditions								Occasional duty: making and breaking conditions					
a.c. supply													
Typical applications	Utilisation category	Making I      U      cos φ			Breaking I      U      cos φ			Making I      U      cos φ			Breaking I      U      cos φ		
Electromagnets													
≤ 72 VA	AC-14	-	-	-	-	-	-	6 I <sub>e</sub>	1.1 U <sub>e</sub>	0.7	6 I <sub>e</sub>	1.1 U <sub>e</sub>	0.7
> 72 VA	AC-15	10 I <sub>e</sub>	U <sub>e</sub>	0.7	I <sub>e</sub>	U <sub>e</sub>	0.4	10 I <sub>e</sub>	1.1 U <sub>e</sub>	0.3	10 I <sub>e</sub>	1.1 U <sub>e</sub>	0.3
d.c. supply													
Typical applications	Utilisation category	Making I      U      L/R (ms)			Breaking I      U      L/R (ms)			Making I      U      L/R (ms)			Breaking I      U      L/R (ms)		
Electromagnets	DC-13	I <sub>e</sub>	U <sub>e</sub>	6 P <sup>(3)</sup>	I <sub>e</sub>	U <sub>e</sub>	6 P <sup>(3)</sup>	1.1 I <sub>e</sub>	1.1 U <sub>e</sub>	6 P <sup>(3)</sup>	1.1 I <sub>e</sub>	1.1 U <sub>e</sub>	6 P <sup>(3)</sup>

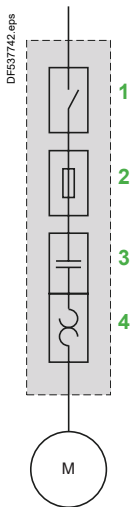
<sup>(1)</sup> I<sub>e</sub> ≤ 17 A for electrical durability, I<sub>e</sub> ≤ 100 A for occasional duty.

<sup>(2)</sup> I<sub>e</sub> > 17 A for electrical durability, I<sub>e</sub> > 100 A for occasional duty.

<sup>(3)</sup> The value 6 P (in watts) is based on practical observations and is considered to represent the majority of d.c. magnetic loads up to the maximum limit of P = 50 W i.e. 6 P = 300 ms = L/R.

Above this, the loads are made up of smaller loads in parallel. The value 300 ms is therefore a maximum limit whatever the value of current drawn.





- 1 Motor Disconnect (Disconnect switch)
- 2 Motor Branch Circuit Protection (Short-circuit protection)
- 3 Motor Controller (Contactor)
- 4 Motor Overload Protection (Thermal overload relay)

## Starters for the North American market

In recent years, the North American market has started to harmonise UL, CSA and ANCE standards, as well as the industrial installation codes provided by national regulations (NEC for the United States, CEC for Canada and MEC for Mexico). <sup>(1)</sup> Major improvements, carried out by the Canena <sup>(2)</sup> are aimed at harmonising product requirements based on IEC <sup>(3)</sup> standards. However, the North American codes use specific terminology for defining the functions of a starter. These functions can be fulfilled by standard IEC products, accompanied by appropriate certifications.

## Combination Starters

Combination Starters are the most common type of packaged motor starter. They are called "Combination" because of their structure and their combined functions. The figure opposite shows the four combined functions that constitute a complete motor starter circuit, defined as a "Motor branch circuit" by the NEC (US National Electric Code) in article 430. Standard UL508 currently gives different types of combination starter that meet the requirements of a "Motor branch circuit".

**Type E**, called "**self-protected combination starter**", covers all these functions and can be controlled manually (thermal-magnetic circuit breaker) or remotely (starter-controller). Type E starters withstand faults within their declared nominal rating without sustaining damage, after which they can be put back into service. In addition, they can withstand more severe short-circuit and durability performance tests without welding or excessive wear of the contact tips.

**Type F**, called "**Combination motor starter**", consists of a type E manual starter (thermal-magnetic circuit breaker) combined with a contactor. These starters are evaluated by means of basic short-circuit tests, but are not considered as "self-protected".

For this combination, the type E starter must be marked "Combination Motor Controller when used with ...", followed by the reference of the load side contactor.

<sup>(1)</sup> **UL**: Underwriters Laboratories, **CSA**: Canadian Standards Association, **ANCE**: Association of Standardization and Certification, **NEC**: National Electric Code, **CEC**: Canadian Electrical Code, **MEC**: Mexican Electrical Code.  
<sup>(2)</sup> **Canena**: Council for Harmonization of Electrotechnical Standardization of North America.  
<sup>(3)</sup> **IEC**: International Electrotechnical Commission.



## Control panels

To help users properly coordinate their motor control equipment with their distribution system in the event of a fault, article 409 of the 2005 NEC requires panel builders to list the short-circuit withstand rating of their motor control panels. According to standard UL508A, manufacturers must use the short-circuit withstand value of the lowest rated device as the nominal withstand rating of the panel, unless the devices have been tested together for a higher coordinated rating. The minimum “**short-circuit current rating**” (SCCR), on motor control components for horsepower ratings of 50 hp or below is 5000 A.

Using a **type E** or **type F** combination starter eliminates the coordination problems of using individual components for the “motor branch circuit protection”, “motor controller” and “motor overload protection” functions.

The panel builder uses the declared short-circuit current rating for the combination starter. This value is generally higher than 5000 A.

This makes it easier to list the short-circuit current ratings and to check the compatibility of a UL508A motor control panel within a given distribution system.

## Group protection

Article 430.53 of the NEC allows a single short-circuit protection device to be used for more than one motor circuit if the components used are marked and listed for such use.

Components suitable for use in group protection, known as “**motor group installations**”, can be marked in one of the following two ways:

### Case n° 1

The contactor and the motor overload relay are both listed as suitable for group installation.

An inverse time circuit breaker can be used as the short-circuit protection device if it is also listed as suitable for group installation.

The panel builder must therefore make sure that the short-circuit protection device selected (fuses or inverse time circuit breaker) does not exceed the value allowed by article 430.40 for the smallest overload relay used in the circuit.

Once these conditions have been met, the panel builder can reduce the size of the conductor connecting the short-circuit protection device to the individual motor contactor/overload relay, to one third of the size of the upstream circuit conductor supplying the protection device.

The panel builder must limit the length of the motor starter conductor (connecting the short-circuit protection device to the motor contactor/overload relay) to a maximum of 7.6 m (25 feet).

### Case n° 2

The motor contactor and overload relay are listed as suitable for “**tap conductor protection**” in group installations.

This category allows the panel designer to reduce the size of the conductor connecting the short-circuit protection device to the individual motor contactor/overload relay, to one tenth of the size of the upstream circuit conductor supplying the protection device.

The designer must limit the length of this conductor to a maximum of 3.05 m (10 feet).

In both cases, the supply circuits must not be less than 125 % of the connected motor FLA (Full Load Amps) rating.

For panel builders, using **type F** combination starters in group installations simplifies group motor considerations.

Each starter is a fully coordinated motor branch circuit.

The panel builder follows the same NEC requirements for sizing the supply conductors as those required for single motor branch circuits.








The size of the supply conductors can be reduced in accordance with the specifications of article 430.28.

This allows the same flexibility in conductor sizing as that offered in article 430.53 (D), without a requirement to check the short-circuit protection rating marked on the components and the overload relay limit.

A UL508A panel does not need a short-circuit protection device when each motor starter installed is a **type F**.

The upstream short-circuit protection device supplying the starter protects the panel. The panel builder only has to consider the panel/enclosure disconnect requirements specified by the NEC or local codes.



TeSys F, V, FG, CR1F Contactors			
Type of product	Range		Pages
Contactors for AC-3 applications TeSys F	From 115 to 1000 A		B9/2
Contactors for AC-1 applications TeSys F	From 200 to 2600 A		B9/3
Vacuum contactors – 1500 V TeSys V	From 160 to 610 A - AC-3 From 160 to 630 A - AC-1		B9/4
Shockproof contactors TeSys FG	From 150 to 630 A - AC-3		B9/6
Magnetic latching contactors TeSys CR1F	From 150 to 630 A - AC-3		B9/7
Reversing pre-assembled contactors for AC-3 applications TeSys F	From 115 to 265 A - AC-3		B9/8
Changeover pre-assembled contactor pairs for AC-1 applications TeSys F	From 200 to 350 A - AC-1		B9/9
Auxiliary contact blocks TeSys F	Accessories – spare parts - delayed opening devices		B9/10
Coils TeSys F			B9/17
Accessories, coils for shockproof and magnetic latching contactors TeSys FG, TeSys CR1F			B9/27
Accessories for reversing and changeover contactor assemblies TeSys LA9F			B9/34



# TeSys

## TeSys F High power contactors

### Product references



LC1F115...500



LC1F630...800



LC1F780



LC1F1000

### 3-pole contactors - Motors 115 to 1000 A / 440 V Category AC-3 - a.c. or d.c. coils

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3							Rated operational current in AC-3	Basic reference, to be completed by adding the voltage code <sup>(2)</sup>	Weight
220 V	380 V	415 V	440 V	500 V	660 V	1000 V	440 V up to	Screw fixing, cabling <sup>(1)</sup>	
kW	kW	kW	kW	kW	kW	kW	A		kg
30	55	59	59	75	80	—	115	LC1F115●●	3.430
40	75	80	80	90	100	—	150	LC1F150●●	3.430
55	90	100	100	110	110	—	185	LC1F185●●	4.650
63	110	110	110	129	129	—	225	LC1F225●●	4.750
75	132	140	140	160	160	—	265	LC1F265●●	7.440
100	160	180	200	200	220	160	330	LC1F330●●	8.600
110	200	220	250	257	280	185	400	LC1F400●●	9.100
147	250	280	295	355	335	—	500	LC1F500●●	11.350
200	335	375	400	400	450	450	630	LC1F630●●	18.600
220	400	425	425	450	475	450	780	LC1F780●●	39.500
250	450	450	450	450	475	450	800	LC1F800●●	18.750
315	560	630	670	—	—	—	1000	LC1F1000●●	31.000

**Note:** auxiliary contact blocks, modules and accessories: see pages B9/10 to B9/27.

<sup>(1)</sup> Power terminals can be protected against direct finger contact by the addition of shrouds, to be ordered separately, except on contactors **LC1F780** (see page B9/14).

<sup>(2)</sup> Standard control circuit voltages (for other voltages, please consult your Regional Sales Office).

Volts ~	24	48	110	115	120	208	220	230	240	380	400	415	440
<b>LC1F115...F225</b>													
40...400 Hz (coil LX9)	—	E7	F7	FE7	G7	L7	M7	P7	U7	Q7	V7	N7	R7
<b>LC1F265...F330</b>													
40...400 Hz (coil LX1)	B7	E7	F7	FE7	G7	L7	M7	P7	U7	Q7	V7	N7	R7
<b>LC1F400...F630, F1250</b>													
40...400 Hz (coil LX1)	—	E7	F7	FE7	G7 <sup>(3)</sup>	L7	M7	P7	U7	Q7	V7	N7	R7
<b>LC1F780</b>													
40...400 Hz (coil LX1)	—	—	F7	FE7	F7	L7	M7	P7	U7	Q7	V7	N7	R7
<b>LC1F800</b>													
40...400 Hz (coil LX4) <sup>(4)</sup>	—	—	FW	FW	FW	—	MW	MW	MW	QW	QW	QW	—
<b>LC1F1000, F1400, F1700, F2100, F2600</b>													
40...400 Hz (coil LX1F)	—	—	F7	—	G7	—	M7	P7	U7	Q7	V7	N7	R7

Volts —	24	48	110	125	220	230	250	400	440
<b>LC1F115...F330</b>									
(coil LX4F)	BD	ED	FD	GD	MD	MD	UD	—	RD
<b>LC1F400...F630, F1250</b>									
(coil LX4F)	—	ED	FD	GD	MD	—	UD	—	RD
<b>LC1F780, LC1F1000, F1400, F1700, F2100, F2600</b>									
(coil LX4F)	—	—	FD	GD	MD	—	UD	—	RD
<b>LC1F800</b>									
(coil LX4F)	—	—	FW	FW	MW	MW	—	QW	—

<sup>(3)</sup> F7 for **LC1F630**.

<sup>(4)</sup> Coil **LX4F8●●** + rectifier **DR5TE●●**.



# TeSys

## TeSys F High power contactors

### Product references



LC1F1854...3304



LC1F4004...5004



LC1F6304



LC1F1250



LC1F1700...2100



LC1F2600


Coordination tables:  
pages A6/36 to A6/56

Characteristics:  
pages B9/44 to B9/53

Dimensions:  
pages B9/54 to B9/57

Schemes:  
pages B9/61 and B9/62

#### 2, 3 or 4-pole contactors - Loads 200 to 2600 A / 440 V Category AC-1 - a.c. or d.c. coils

Maximum current in AC-1 ( $\theta \leq 40^\circ\text{C}$ )	Number of poles 	Basic reference, to be completed by adding the voltage code <sup>(2)</sup> Screw fixing, cabling <sup>(1)</sup>	Weight
A			kg
200	3	LC1F115●●	3.430
	4	LC1F1154●●	3.830
250	3	LC1F150●●	3.430
	4	LC1F1504●●	3.830
275	3	LC1F185●●	4.390
	4	LC1F1854●●	5.450
315	3	LC1F225●●	4.750
	4	LC1F2254●●	5.550
350	3	LC1F265●●	7.440
	4	LC1F2654●●	8.540
400	3	LC1F330●●	8.600
	4	LC1F3304●●	9.500
500	2	LC1F4002●●	8.000
	3	LC1F400●●	9.100
	4	LC1F4004●●	10.200
700	2	LC1F5002●●	9.750
	3	LC1F500●●	11.350
	4	LC1F5004●●	12.950
1000	2	LC1F6302●●	15.500
	3	LC1F630●●	18.600
	4	LC1F6304●●	21.500
1200	3	LC1SF1200KUE	13.400
1260	3	LC1F1250●●	19.000
1400	3	LC1F1400●●	29.000
1600	3	LC1F780●●	39.500
	4	LC1F7804●●	48.000
1700	3	LC1F1700●●	30.000
2100 <sup>(3)</sup>	3	LC1F2100●●	31.000
2600 <sup>(4)</sup>	3	LC1F2600●●	36.000

**Note:** auxiliary contact blocks, modules and accessories: see pages B9/10 to B9/27.

<sup>(1)</sup> Power terminals can be protected against direct finger contact by the addition of shrouds, to be ordered separately (except **LC1F780**, **LC1F1250**, **LC1F1400**, **LC1F1700** and **LC1F2100**), see page "TeSys contactors", page B9/14.

<sup>(2)</sup> Standard control circuit voltages, see previous page.

<sup>(3)</sup> With set of right-angled connectors **LA9F2100** (see page B9/13).

<sup>(4)</sup> With set of right-angled connectors **LA9F2600** (see page B9/13).

COORD.



High power contactors



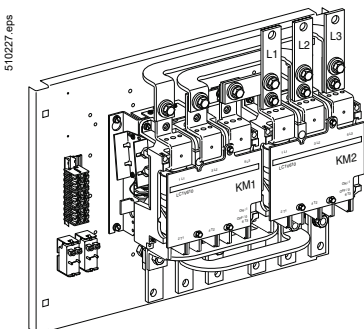
# TeSys

## TeSys V High power vacuum contactors

### Product references



LC1V320



LC2V610



LA9V974

#### Vacuum contactors - Motors 160 to 610 A / 400 V - a.c. coils

Standard power ratings 50/60 Hz in category AC-3						Rated operational current le	Instan- taneous auxiliary contacts	Control circuit voltage (50/60 Hz)	Basic reference <sup>(1)</sup>	Weight
230 V	400 V	525 V	690 V	1000 V	AC-3 400 V up to	AC-1 400 V up to				
kW	kW	kW	kW	kW	A	A				kg
45	75	110	150	200	160	160	2	1	<sup>(1)</sup>	LC1V160●● 3.800
90	160	220	280	400	320	320	1	1	<sup>(1)</sup>	LC1V320●● 10.500
160	300	400	560	800	610	630	1	1	<sup>(1)</sup>	LC1V610●● 13.000

#### Reversing vacuum contactors

The reversing contactor range comprises :

- for 160 A rating, a kit with set of power connections allowing assembly of the starter
- for 320 and 610 A ratings, a complete starter, ready for use.

Standard power ratings 50/60 Hz in category AC-3						Rated operational current le	Instan- taneous auxiliary contacts	Control circuit voltage (50/60 Hz)	Basic reference <sup>(1)</sup>	Weight
230 V	400 V	525 V	690 V	1000 V	AC-3 400 V up to	AC-1 400 V up to				
kW	kW	kW	kW	kW	A	A				kg
45	75	110	150	200	160	160	2	1	—	LA9V974 <sup>(2)</sup> 1.200
90	160	220	280	400	320	320	1	1	110-120 V	LC2V320FE7 30
									220-240 V	LC2V320P7 30
									380-415 V	LC2V320V7 30
160	300	400	560	800	610	630	1	1	110-120 V	LC2V610FE7 36
									220-240 V	LC2V610P7 36

<sup>(1)</sup> Basic reference; add code indicating control circuit voltage.

Standard control circuit voltages:

Volts 50/60 Hz	110...120	220...240	380...415	440...480	550...600
Item	FE7	P7	V7	R7	X7

<sup>(2)</sup> Kit containing a mechanical interlock, a set of power connections and a fixing plate.  
To build a complete reversing contactor, order contactors LC1V160●● separately.





LA1VN11



LX1V320●●

Instantaneous auxiliary contact blocks <sup>(1)</sup>			
Number of contacts	Maximum number of blocks per contactor	Auxiliary contacts	Reference
2	4	1 1	LA1VN11
		– 2	LA1VN02
		2 –	LA1VN20
		1 1	LA1VN11X <sup>(2)</sup>

50/60 Hz coils		
Rated voltage	Voltage code	Reference
V		
For contactors LC1V160		
110...120	FE7	LX1V160FE7
220...240	P7	LX1V160P7
380...415	V7	LX1V160V7
440...480	R7	LX1V160R7
550...600	X7	LX1V160X7
For contactors LC1V320		
110...120	FE7	LX1V320FE7
220...240	P7	LX1V320P7
380...415	V7	LX1V320V7
440...480	R7	LX1V320R7
550...600	X7	LX1V320X7
For contactors LC1V610		
110...120	FE7	LX1V610FE7
220...240	P7	LX1V610P7
380...415	V7	LX1V610V7
440...480	R7	LX1V610R7
550...600	X7	LX1V610X7

**(1) LC1V160:** auxiliary contact blocks mounted at the top of the contactor, with no change to the overall dimensions.

**LC1V320 or LC1V610:** 2 auxiliary contact blocks mounted on the RH and LH side of the contactor, with no change to the overall dimensions.

**(2) For LC1V160:** 1 N/C contact for the coil + 1 N/O contact.



TeSys

TeSys FG High power shockproof contactors

Product references



LC1FG150



LC1FG185



LC1FG265

Important notice: LC1FG range is planned for discontinuation without replacement.  
Before ordering, please consult your regional sales office for availability.

3-pole shockproof contactors - Motors 150 to 630 A / 440 V AC-3, loads 250 to 1000 A / 440 V / AC-1 - a.c. coil

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3							Rated operational current in cat. AC-3, 440 V/AC-1 up to	Basic reference, to be completed by adding the voltage code <sup>(1)</sup> Screw fixing, cabling <sup>(2)</sup>	Weight
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V	1000 V			
kW	kW	kW	kW	kW	kW	kW	A		kg
40	75	80	80	90	100	65	150/250	LC1FG150●●	3.430
55	90	100	100	110	110	100	185/275	LC1FG185●●	4.650
75	132	140	140	160	160	147	265/350	LC1FG265●●	7.440
110	200	220	250	257	280	185	400/500	LC1FG400●●	9.100
147	250	280	295	355	335	335	500/700	LC1FG500●●	11.350
200	335	375	400	400	450	450	630/1000	LC1FG630●●	18.600

**Note:** these contactors have instantaneous auxiliary contact blocks with 2 N/O contacts, 1 N/C contact and one coil maintaining contact.

<sup>(1)</sup> Power terminals can, if required, be protected against direct finger contact by the addition of shrouds, to be ordered separately. See page B9/14.

<sup>(2)</sup> Please consult your Regional Sales Office to get the details on available coil voltages.



High power  
contactors



# TeSys

## TeSys CR1F High power magnetic latching contactors

### Product references



CR1F1854



CR1F500

3, 4 pole - Motors 150 to 630 A / 440 V / AC-3, loads 250 to 1000 A / 440 V AC-1 - a.c. or d.c. coils						
Maximum thermal current in category AC-1 40 °C	Rated operational current in category AC-3 (440 V max)	Number of poles	Instantaneous auxiliary contacts		Basic reference, to be completed by adding the voltage code <sup>(1)</sup>	Weight
A	A					kg
250	150	3	—	—	CR1F150●●	3.500
		4	—	—	CR1F1504●●	3.800
275	185	3	—	—	CR1F185●●	4.600
		4	—	—	CR1F1854●●	5.400
350	265	3	—	—	CR1F265●●	7.400
		4	—	—	CR1F2654●●	8.500
500	400	3	—	—	CR1F400●●	9.100
		4	—	—	CR1F4004●●	10.200
700	500	3	—	—	CR1F500●●	11.300
		4	—	—	CR1F5004●●	12.900
1000	630	3	—	—	CR1F630●●	18.600
		4	—	—	CR1F6304●●	21.500

**Note:** accessories, replacement parts and spare coils, see pages B9/31 to B9/33.

**(1)** Standard control circuit voltages: see page B9/32.



High power contactors



# TeSys

## TeSys F High power reversing contactors

### Product references

PE112345.eps



LC2F115

PE111952.eps



LA9F701...703



### 3-pole reversing contactors - Motors 115 to 265 A / 440 V / AC-3 - a.c. or d.c. coils

#### Pre-wired power connections (horizontally mounted) <sup>(1)</sup>

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3						Operational current in AC-3	Maximum operational voltage	Contactors supplied without coil <sup>(2)</sup> Complete reference Fixing, cabling <sup>(3)</sup>	Weight
220 V 380 V 660 V 230 V 400 V 415 V 440 V 500 V 690 V						440 V up to			
kW	kW	kW	kW	kW	kW	A	V		kg
30	55	59	59	75	80	115	690	LC2F115	7.560
40	75	80	80	90	100	150	690	LC2F150	7.560
55	90	100	100	110	110	185	690	LC2F185	10.100
63	110	110	110	129	129	225	690	LC2F225	14.200
75	132	140	140	160	160	265	690	LC2F265	16.480

#### Accessories (to be ordered separately)

Description	For reversing contactors	Quantity required	Reference
Power terminal protection shrouds	LC2F115	2	LA9F701
	LC2F150, F185	2	LA9F702
	LC2F225, F265	2	LA9F703
Auxiliary contact blocks and add-on modules	—	—	See pages B9/10 to B9/14

(1) Fitted with a mechanical interlock without electrical interlocking. Order separately 2 auxiliary contact blocks **LADN•1** to obtain electrical interlocking between the 2 contactors, see page B9/11. For accessories, see pages B9/12 to B9/14.

(2) Coils to be ordered separately:  
- a.c. supply, see pages B9/2, B9/17 and B9/18,  
- d.c. supply, see pages B9/2 and B9/23.

(3) Screw fixing.  
Power terminals can be protected against direct finger contact by the addition of shrouds, to be ordered separately, see above.



#### Control Panel Technical Guide:

Description and product reference of all mounting kits and wiring accessories for TeSys D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011\_EN



> Click on QR code to download



# TeSys

## TeSys F High power changeover contactors

### Product references



LC2F1854



LA9F706...708

#### 4-pole changeover contactor pairs - Loads 200 to 350 A AC-1 - a.c. or d.c. coils

##### Pre-wired power connections (horizontally mounted) <sup>(1)</sup>

Utilisation category AC-1 Non inductive loads Maximum operational current $\theta < 40^\circ\text{C}$	Maximum operational voltage	Contactors supplied without coil <sup>(2)</sup> Complete reference Fixing, cabling <sup>(3)</sup>	Weight
A	V		kg
200	690	LC2F1154	8.860
250	690	LC2F1504	8.860
275	690	LC2F1854	12.100
315	690	LC2F2254	15.200
350	1000	LC2F2654	19.480

##### Accessories (to be ordered separately)

Description	For changeover pairs	Quantity required	Reference
Power terminal	LC2F1154	2	LA9F706
Protection shrouds	LC2F1504, F1854	2	LA9F707
	LC2F2254, F2654	2	LA9F708
Auxiliary contact blocks – and add-on modules	–	–	See pages B9/10 to B9/14

(1) Fitted with a mechanical interlock without electrical interlocking. Order separately 2 auxiliary contact blocks **LADN●1** to obtain electrical interlocking between the 2 contactors, see page B9/11. For accessories, see pages B9/12 to B9/14.

(2) Coils to be ordered separately:

- a.c. supply, B9/2, B9/17 and B9/18,
- d.c. supply, see pages B9/2 and B9/23.

(3) Screw fixing.

Power terminals can be protected against direct finger contact by the addition of shrouds, to be ordered separately, see above.



High power  
contactors



#### Control Panel Technical Guide:

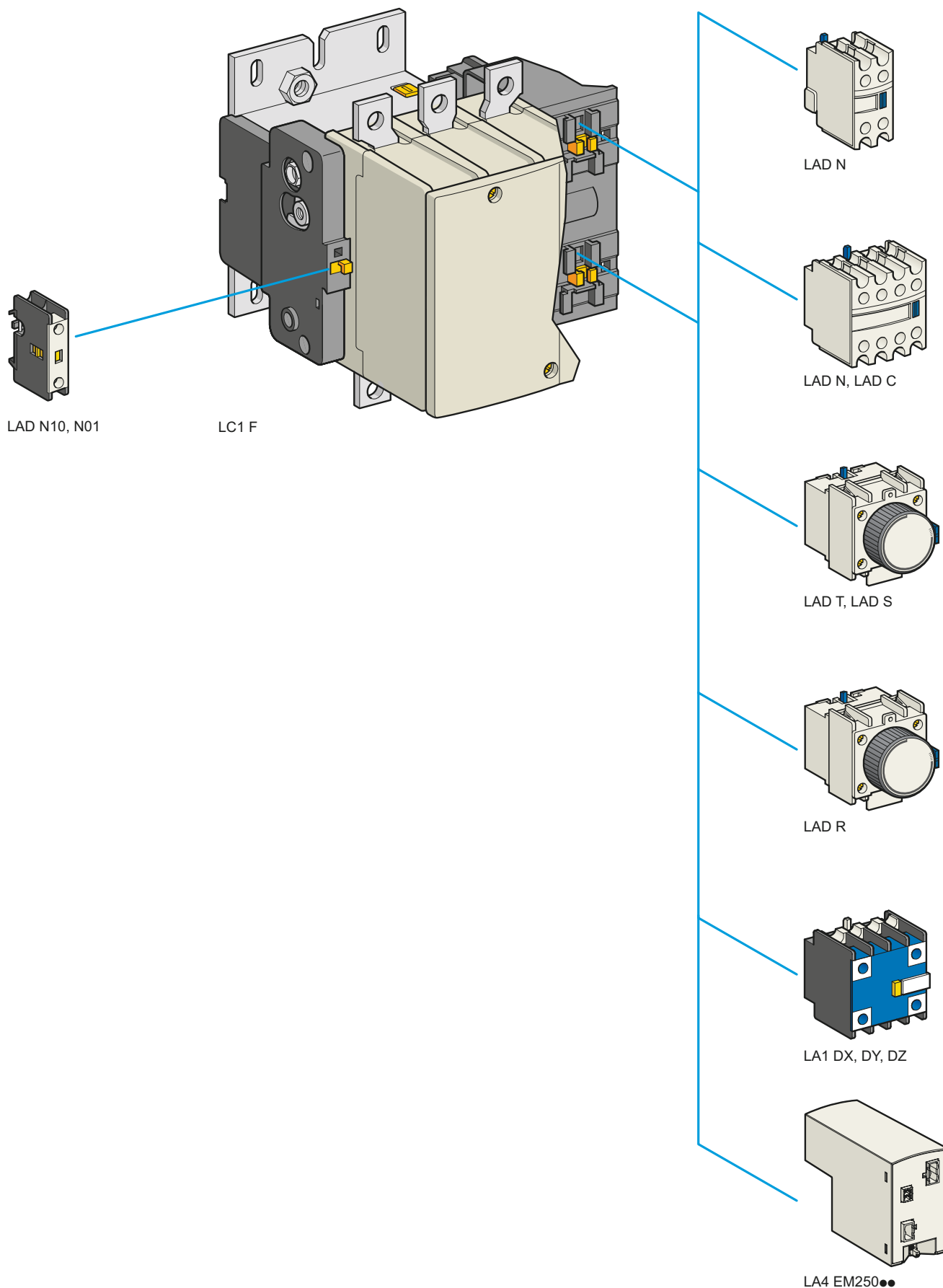
Description and product reference of all mounting kits and wiring accessories for TeSys D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011\_EN



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




High power  
contactors



**Instantaneous auxiliary contact blocks****For use in normal operating environments**

Number of contacts	Maximum number of blocks per contactor Clip-on mounting	Composition				Reference
						
1	1	–	–	1	–	LADN10
		–	–	–	1	LADN01
2	2	–	–	1	1	LADN11
		–	–	2	–	LADN20
		–	–	–	2	LADN02
4	2	–	–	2	2	LADN22
		–	–	1	3	LADN13
		–	–	4	–	LADN40
		–	–	–	4	LADN04
		–	–	3	1	LADN31
		–	–	2	2 <sup>(1)</sup>	LADC22





**With terminal referencing conforming to EN 50012**

2	2	–	–	1	1	LADN11P
		–	–	1	1	LADN11G
4	2	–	–	2	2	LADN22P
		–	–	2	2	LADN22G

**Instantaneous auxiliary contact blocks for connection by lugs**

This type of connection is not possible for blocks with 1 contact or blocks with dust and damp protected contacts. For all other instantaneous auxiliary contact blocks, add the figure 6 to the end of the references selected above. Example: LADN11 becomes LADN116.

**Instantaneous auxiliary contact blocks with dust and damp protected contacts****Recommended for use in particularly harsh industrial environments**

Number of contacts	Maximum number of blocks per contactor Clip-on mounting	Composition				Reference
						
2	2	2	–	–	–	LA1DX20
		2	2 <sup>(2)</sup>	–	–	LA1DY20
4	2	2	–	2	–	LA1DZ40
		2	–	1	1	LA1DZ31

**Time delay auxiliary contact blocks**

Number of contacts	Maximum number of blocks per contactor Clip-on mounting	Time delay		Reference
		Type	Range s	
1 N/O + 1 N/C	2	On-delay	0...3 <sup>(3)</sup>	LADT0
			1...30	LADT2
			10...180	LADT4
		Off-delay	1...30 <sup>(4)</sup>	LADS2
			0...3 <sup>(3)</sup>	LADR0
			1...30	LADR2
			10...180	LADR4

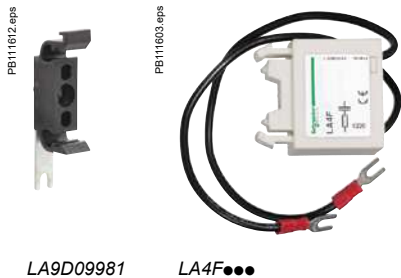
(1) Including 1 N/O + 1 N/C make before break.

(2) Device fitted with 4 earth screen continuity terminals.

(3) With extended scale from 0.1 to 0.6 s.

(4) With switching time of 40 ms ±15 ms between opening of the N/C contact and closing of the N/O contact.





### Suppressor blocks <sup>(1)</sup>

#### RC circuits (resistor-capacitor)

- Effective protection for circuits highly sensitive to "high frequency" interference. For use only in cases where the voltage is virtually sinusoidal, i.e. less than 5 % total harmonic distortion.
- Voltage limited to 3  $U_c$  max. and oscillating frequency limited to 400 Hz max.
- Slight increase in drop-out time (1.1 to 1.3 times the normal time).

Mounting	$U_c$		Reference
Clip-on mounting on all ratings and all a.c. coils.	~	24...48 V	LA4FRCE
		50...110 V	LA4FRCF
		127...240 V	LA4FRCP
		265...415 V	LA4FRCV
Suppressor block bracket			LA9D09981

#### Varistors (peak limiting)

- Protection provided by limiting the transient voltage to 2  $U_c$  max.
- Maximum reduction of transient voltage peaks.

Clip-on mounting on all ratings and all coils.	~ or ---	24...48 V	LA4FVE
		50...110 V	LA4FVF
		127...240 V	LA4FVP
		265...415 V	LA4FVV

#### Diodes

- No overvoltage or oscillating frequencies.
- Increase in drop-out time (3 to 4 times the normal time).
- Polarised component.

Clip-on mounting on all ratings and all d.c. coils.	---	24...48 V	LA4FDE
		55...110 V	LA4FDF
		125...250 V	LA4FDP
		280...440 V	LA4FDV

#### Bidirectional peak limiting diodes (transil)

- Protection provided by limiting the transient voltage to between 2 and 2.5 times  $U_c$  max.
- Maximum reduction of transient voltage peaks.

Clip-on mounting on all ratings and all coils.	~ or ---	24...48 V	LA4FTE
		50...110 V	LA4FTF
		127...240 V	LA4FTP
		265...415 V	LA4FTV

### Connection accessories

For use on 4-pole contactors	Set of 4 links Set reference	Weight kg
<b>Links for parallel connection of poles (in pairs)</b>		
LC1F1154	LA9FF602	0.200
LC1F1504, F1854	LA9FG602	0.350
LC1F2254, F2654, F3304, F4004	LA9FH602	1.000
LC1F5004	LA9FK602	1.750
LC1F6304	LA9FL602	3.000
<b>Links for "star" connection of 3 poles</b>		
LC1F115	LA9FF601	0.035
LC1F150, F185	LA9FG601	0.050
LC1F225, F265, F330, F400	LA9FH601	0.120
LC1F500	LA9FK601	0.180
LC1F630, F800	LA9FL601	0.550

#### Control circuit voltage take-off from power terminals

For use with contactors	Mounted on bolt size	Sold in lots of	Unit reference
LC1F115	M6	10	DZ3FA3
LC1F150, F185	M8	10	DZ3GA3
LC1F225...F500	M10	10	DZ3HA3
LC1F630, F800	M12	10	DZ3JA3

<sup>(1)</sup> Order 2 x LA4F... for F780, F1000, F1400, F1700, F2100 & F2600 contactors and connect one suppressor block across each coil.  
For example, for a LC1F1400M7 (220 V coil) contactor, use 2 x LA4FRCF (110 V) as RC type surge suppressors.





LA9F981 (set of 3)



LA9F979 (set of 3)



LA9FL980 (set of 3)



LA9F1250 (set of 6)



LA9F2100 (set of 6)



LA9F2600 (set of 6)



LA7F404 (set of 3)

### Right-angled connectors

#### For contactors or thermal overload relays

For use with Contactors	Thermal overload relays <sup>(1)</sup>	With connector plates		Set of 3 connectors	
		Width	Type	Set reference	Weight kg
LC1F115	LR9F567, LR9F67	15 mm	Rear	LA9FF981	0.060
			Side	LA9FF979	0.240
			Large surface area	LA9FF980	0.150
LC1F150, F185	LR9F569, F571, LR9F69, F71	20 mm	Rear	LA9FG981	0.080
			Side	LA9FG979	0.350
			Large surface area	LA9FG980	0.200
LC1F225, F265, F330, F400	LR9F775, LR9F75	25 mm	Rear	LA9FJ981	0.430
			Side	LA9FJ979	0.750
			Large surface area	LA9FJ980	0.490
LC1F500	LR9F779, F781, LR9F79, F81	30 mm	Rear	LA9FK981	0.480
			Side	LA9FK979	0.920
			Large surface area	LA9FK980	0.800
LC1F630, F800	LR9F781, LR9F81	40 mm	Rear	LA9FL981	1.210
			Side	LA9FL979	2.570
			Large surface area	LA9FL980	3.190

For use with Contactors	Thermal overload relays <sup>(1)</sup>	With connector plates		Set of 6 connectors	
		Width	Type	Set reference	Weight kg
LC1F1250		60 mm	Rear	LA9F1250	5.480
LC1F1000, F1400, F1700, F2100		60 mm	Rear	LA9F2100	9.550
LC1F2600		100 mm	Rear	LA9F2600	4.380

### Connection accessories

#### For reversing contactors or "star-delta" contactors combined with a thermal overload relay

For use with Contactors	Thermal overload relays <sup>(1)</sup>	Width of connector plates	Set of 3 busbars	
			Set reference	
LC1F115	LR9F557, F563 LR9F567, F569 LR9F69, F71	15 mm	LA7F401	
LC1F150 and F185	LR9F557, F563	20 mm	LA7F402	
LC1F185	LR9F571, LR9F71	25 mm	LA7F407	
LC1F225 and F265	LR9F571, LR9F71	25 mm	LA7F403	
	LR9F775, F779 LR9F75, F79	25 mm	LA7F404	
LC1F330 and F400	LR9F775, F779 LR9F75, F79	25 mm	LA7F404	
LC1F400	LR9F781, LR9F81	25 mm	LA7F404	
LC1F500	LR9F775, F779 LR9F781, LR9F75, F79, F81	30 mm	LA7F405	
LC1F630, F800	LR9F781, LR9F81	40 mm	LA7F406	

(1) For protection relays class 10, replace the ● with a 3 and for class 20, replace the ● with a 5.



# TeSys

## TeSys F High power contactors - Accessories

### Product references



LA9F103



LA9F701



LA9F801



LA4EM250FK

High power contactors

#### Insulated terminal blocks

For use on 3-pole contactors	Connection	Tightening tool	Set of 2 blocks Set reference
LC1F115, F150, F185	1 x 16...150 mm <sup>2</sup> or 2 x 16...95 mm <sup>2</sup>	4 mm hexagonal socket key	LA9F103

#### Power terminal protection shrouds

For use on 2, 3 and 4-pole contactors	Number of shrouds per set	Set reference
LC1F115	6	LA9F701
LC1F150, F185	6	LA9F702
LC1F225, F265, F330, F400 and F4002 F500 and F5002	6	LA9F703
LC1F630, F6302 and F800	6	LA9F704
LC1F1154	8	LA9F706
LC1F1504 and F1854	8	LA9F707
LC1F2254, F2654, F3304, F4004, F5004	8	LA9F708
LC1F6304	8	LA9F709

#### Phase separators

For use on 3-pole contactors	No. of barriers per set	Set reference
LC1F1400, F1700 F2100 and F2600	4	LA9F801

#### Electronic Control Module (ECM) <sup>(1)</sup>

For use on 2, 3 and 4-pole contactors	With coil reference	ECM reference
LC1F115, F150	LXEFF250	LA4EM250FF
LC1F185, F225	LXEFG250	LA4EM250FG
LC1F265, F330	LXEFH250	LA4EM250FH
LC1F400	LXEFJ250	LA4EM250FJ
LC1F500	LXEFK250	LA4EM250FK <sup>(2)</sup>
LC1F630	LXEFL250	LA4EM250FL <sup>(2)</sup>
LC1F800	LXEFW250	LA4EM250FW
LC1SF1200	LXEFK250	LA4EM250FK
LC1F1250	LXEFL250	LA4EM250FL <sup>(2)</sup>

<sup>(1)</sup> ECM enables wider coil operating voltage for the TeSys F range of contactors.

<sup>(2)</sup> These ECM references + LXE coils will be available for ordering by end of June 2020.

**Note:** Refer to page numbers B9/52, B9/53 for detailed technical information.



#### Control Panel Technical Guide:

Description and product reference of all mounting kits and wiring accessories for TeSys D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011\_EN



> Click on QR code  
to download



# TeSys

## TeSys F High power contactors - Accessories

### Product references

PB121428.eps



LA5FG431

PB11605.eps



LA5F11550

PB11606.eps



LA5F63050

#### Sets of contacts

Per pole: 2 fixed contacts, 1 moving contact, 2 deflectors, 1 back-plate, clamping screws and washers.

For contactor	Type	Replacement for	Reference	Weight kg
2-pole	LC1F4002	2 poles	LA5F400802	1.350
	LC1F5002	2 poles	LA5F500802	1.950
	LC1F6302	2 poles	LA5F630802	4.700
3-pole	LC1F115. F150	3 poles	LA5FF431	0.270
	LC1F185. F225	3 poles	LA5FG431	0.350
	LC1F265	3 poles	LA5FH431	0.660
	LC1F330. F400	3 poles	LA5F400803	2.000
	LC1F500	3 poles	LA5F500803	2.950
	LC1F630	3 poles	LA5F630803	6.100
	LC1F780	1 pole	LA5F780801 <sup>(1)</sup>	4.700
		3 poles	LA5F780803	13.200
4-pole	LC1F800	3 poles	LA5F800803	6.100
	LC1F1504. F1154	4 poles	LA5FF441	0.360
	LC1F1854. F2254	4 poles	LA5FG441	0.465
	LC1F2654	4 poles	LA5FH441	0.880
	LC1F3304. F4004	4 poles	LA5F400804	2.700
	LC1F5004	4 poles	LA5F500804	3.900
	LC1F6304	4 poles	LA5F630804	8.150
	LC1F7804	1 pole	LA5F780801 <sup>(1)</sup>	4.700
		4 poles	LA5F780804	17.300

#### Arc chambers

For contactor	Type	Replacement for	Reference	Weight kg
2-pole	LC1F4002	2 poles	LA5F400250	0.870
	LC1F5002	2 poles	LA5F500250	1.250
	LC1F6302	2 poles	LA5F630250	2.100
3-pole	LC1F115	3 poles	LA5F11550	0.490
	LC1F150	3 poles	LA5F15050	0.490
	LC1F185	3 poles	LA5F18550	0.670
	LC1F225	3 poles	LA5F22550	0.670
	LC1F265	3 poles	LA5F26550	0.920
	LC1F330	3 poles	LA5F33050	1.300
	LC1F400	3 poles	LA5F40050	1.300
	LC1F500	3 poles	LA5F50050	1.850
	LC1F630	3 poles	LA5F63050	3.150
	LC1F780	1 pole	LA5F780150 <sup>(1)</sup>	2.100
	LC1F800	3 poles	LA5F80050	3.150
4-pole	LC1F1154	4 poles	LA5F115450	0.660
	LC1F1504	4 poles	LA5F150450	0.660
	LC1F1854	4 poles	LA5F185450	0.910
	LC1F2254	4 poles	LA5F225450	1.000
	LC1F2654	4 poles	LA5F265450	1.220
	LC1F3304	4 poles	LA5F330450	1.740
	LC1F4004	4 poles	LA5F400450 <sup>(2)</sup>	1.740
	LC1F5004	4 poles	LA5F500450 <sup>(2)</sup>	2.500
	LC1F6304	4 poles	LA5F630450 <sup>(3)</sup>	4.200
	LC1F7804	1 pole	LA5F780150 <sup>(1)</sup>	2.100

<sup>(1)</sup> Comprising 2 identical items per pole.

<sup>(2)</sup> Comprising two 2-pole arc chambers.

<sup>(3)</sup> Comprising single-pole arc chambers.

High power contactors





LAZR90F

High power  
contactors

## Capacitive delayed opening device

These devices prevent inadvertent opening of a contactor in the event of a brief volt drop or momentary supply failure.

### For contactors with d.c. coil supply

For use with contactor		Corresponding delayed opening device		
Type	With coil	Supply voltage 50/60 Hz	Non-adjustable delay time (Tr)	Reference
		V	s	
LC1F115 or LC1F150	LX4FF110	110	2...5	LAZR90F
	LX4FF125	127	2...5	LAZR90F
	LX4FF220	220	2...5	LAZR90M
	LX4FF250	240	2...5	LAZR90M
	LX4FF375	380...415	2...5	LAZR90Q
	LX4FF440	440	2...5	LAZR90Q
LC1F185 or LC1F225	LX4FG110	110	2...5	LAZR90F
	LX4FG125	127	2...5	LAZR90F
	LX4FG220	220	2...5	LAZR90M
	LX4FG250	240	2...5	LAZR90M
	LX4FG375	380...415	2...5	LAZR90Q
	LX4FG440	440	2...5	LAZR90Q
LC1F265 or LC1F330	LX4FH110	110	2...5	LAZR90F
	LX4FH125	127	2...5	LAZR90F
	LX4FH220	220	2...5	LAZR90M
	LX4FH250	240	2...5	LAZR90M
	LX4FH375	380...415	2...5	LAZR90Q
	LX4FH440	440	2...5	LAZR90Q
LC1F400	LX4FJ110	110	1...2	LAZR90F
	LX4FJ125	127	1...2	LAZR90F
	LX4FJ220	220	1...2	LAZR90M
	LX4FJ250	240	1...2	LAZR90M
	LX4FJ375	380	1...2	LAZR90Q
	LX4FJ400	415	1...2	LAZR90Q
	LX4FJ440	440	1...2	LAZR90Q
LC1F500	LX4FK110	110	1...2	LAZR90F
	LX4FK125	127	1...2	LAZR90F
	LX4FK220	220	1...2	LAZR90M
	LX4FK250	240	1...2	LAZR90M
	LX4FK375	380	1...2	LAZR90Q
	LX4FK400	415	1...2	LAZR90Q
	LX4FK440	440	1...2	LAZR90Q
LC1F630	LX4FL110	110	1...2	LAZR90F
	LX4FL125	127	1...2	LAZR90F
	LX4FL220	220	1...2	LAZR90M
	LX4FL250	240	1...2	LAZR90M
	LX4FL375	380	1...2	LAZR90Q
	LX4FL400	415	1...2	LAZR90Q
	LX4FL440	440	1...2	LAZR90Q

### Add-on blocks for delayed opening devices

Application	For use with delayed opening device	Operational voltage	Non-adjustable delay time	Reference
		V	s	
To double the delay time	LAZR90F	110...127	Tr x 2	LAZR91F
	LAZR90M	220...240	Tr x 2	LAZR91M
	LAZR90Q	380...440	Tr x 2	LAZR91Q

### Other versions

Delayed opening devices for use with other types of contactor. Please consult your Regional Sales Office.



PB112332.eps



LX9FF...

PB121427.eps



LX9FG...

PB121425.eps



LXEFK250

**Specifications**

Average consumption at 20 °C; 50 Hz/ 60 Hz;

cos  $\phi$  = 0.5:

■ inrush: 550 VA

■ sealed: 8 VA.

Heat dissipation: 5 W.

Operating time at  $U_c$ : closing = 40...80 ms,

opening = 10...40 ms.

Operating cycles/hour ( $\theta \leq 55$  °C): 1200.

Embedded PLC input according IEC 61131-2 type 2:

■ Off state: 0...5 V DC

■ On state: 11...30 V DC.

**Coils for a.c., 40...400 Hz control voltage**

Low sealed consumption.

High tolerance to inrush voltage drops.

Immune to micro-breaks (mains supply or contact chain).

Operate on networks with harmonic numbers  $\leq 7$ .

Control circuit voltage $U_c$	Average resistance at 20 °C $\pm 10$ %		Inductance of closed circuit	Voltage code	Reference
	Inrush	Sealed			
V	$\Omega$	$\Omega$	H		
<b>For contactors LC1F115 and LC1F150</b>					
24	0.97	26.3	0.15	B7	LX9FF024
42	2.51	64.5	0.3	D7	LX9FF042
48	3.03	80.2	0.3	E7	LX9FF048
110	14.8	579	2.08	F7	LX9FF110
115	14.8	579	2.08	FE7	LX9FF110
120/127	19	746	2.65	G7	LX9FF127
220	59.4	2190	7.7	M7	LX9FF220
230	59.4	2190	7.7	P7	LX9FF220
240	73.5	2750	9.68	U7	LX9FF240
380	173	6540	23	Q7	LX9FF380
400	173	6540	23	V7	LX9FF380
415	218	8460	30	N7	LX9FF415
440	218	8460	30	R7	LX9FF415
500	262	10300	36	S7	LX9FF500
600	501	29674	43.58	X7	LX9FF600

**Specifications**

Average consumption at 20 °C: inrush: 690...855 VA, sealed: 6.6...8.1 VA.

Heat dissipation: 5.9...7.2 W.

Operating cycles/hour ( $\theta \leq 55$  °C): < 2400.Operating time at  $U_c$ : closing = 35 ms, opening = 130 ms.**For contactors LC1F185 and LC1F225**

24	0.56	34	0.13	B7	LX9FG024
42	1.8	46	0.25	D7	LX9FG042
48	2.2	60	0.23	E7	LX9FG048
110	10.4	411	1.46	F7	LX9FG110
115	10.4	411	1.46	FE7	LX9FG110
120/127	13	520	1.85	G7	LX9FG127
220	42.1	1680	5.84	M7	LX9FG220
230	42.1	1680	5.84	P7	LX9FG220
240	50.6	2060	7.22	U7	LX9FG240
380	128	4730	16.4	Q7	LX9FG380
400	128	4730	16.4	V7	LX9FG380
415	157	5930	20.6	N7	LX9FG415
440	157	5930	20.6	R7	LX9FG415
500	194	7550	26.3	S7	LX9FG500
600	406	19550	36.1	X7	LX9FG600

**Specifications**

Average consumption at 20 °C: inrush: 950...1180 VA, sealed: 8.9...10.9 VA.

Heat dissipation: 8...9.8 W.

Operating cycles/hour ( $\theta \leq 55$  °C): < 2400.Operating time at  $U_c$ : closing = 35 ms, opening = 130 ms.**For contactor LC1SF1200**

100...250	100...250	9.16	0.16	KUE	LXEFK250
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## Coils for a.c., 40...400 Hz control voltage

Low sealed consumption.

Operate on networks with harmonic numbers  $\leq 7$ .

PB121425.eps



LX1FH...2

Control circuit voltage U <sub>c</sub>	Average resistance at 20 °C ±10 %		Inductance of closed circuit	Voltage code	Reference
	Inrush	Sealed			
V	Ω	Ω	H		
<b>For contactors LC1F265 and LC1F330</b>					
24	0.8	20	(1)	B7	LX1FH0242
48	2.96	67	(1)	E7	LX1FH0482
110	18.7	440	(1)	F7	LX1FH1102
115	18.7	440	(1)	FE7	LX1FH1102
120/127	22.9	536	(1)	G7	LX1FH1272
200/208	58.4	1366	(1)	L7	LX1FH2002
220	70.6	1578	(1)	M7	LX1FH2202
230	70.6	1578	(1)	P7	LX1FH2202
240	87.94	1968	(1)	U7	LX1FH2402
277	113	2444	(1)	W7	LX1FH2772
380	217	4631	(1)	Q7	LX1FH3802
400	217	4631	(1)	V7	LX1FH3802
415	217	4631	(1)	N7	LX1FH3802
440	265	6731	(1)	R7	LX1FH4402
480/500	329	8543	(1)	S7	LX1FH5002
600/660	296	10245	(1)	X7	LX1FH6002
1000	696	25880	(1)	—	LX1FH10002

### Specifications

Average consumption at 20 °C for 50 or 60 Hz and  $\cos \varphi = 0.9$ :

■ inrush: 600...700 VA

■ sealed: 8...10 VA.

Heat dissipation: 8 W.

Operating time at U<sub>c</sub>: closing = 40...65 ms, opening = 100...170 ms.

Operating cycles/hour ( $\theta \leq 55$  °C):  $\leq 2400$ .

PB121482.eps



LX1FJ...

<b>For contactor LC1F400</b>					
48	1.6	29.5	0.18	E7	LX1FJ048
110/120	9.8	230	1.35	F7	LX1FJ110
115	9.8	230	1.35	FE7	LX1FJ110
120/127	12.8	280	1.75	G7	LX1FJ127
200/208	30	815	4.1	L7	LX1FJ200
220	37	1030	5.1	M7	LX1FJ220
230	37	1030	5.1	P7	LX1FJ220
240	47.5	1320	6.4	U7	LX1FJ240
265/277	61	1700	8.1	W7	LX1FJ280
380	120	3310	15.8	Q7	LX1FJ380
400	120	3310	15.8	V7	LX1FJ380
415	145	4070	19.4	N7	LX1FJ415
440	145	4070	19.4	R7	LX1FJ415
500	190	4980	25.5	S7	LX1FJ500
550/600	243	6310	27.4	X7	LX1FJ600
1000	720	19420	84.6	—	LX1FJ1000

### Specifications

Average consumption at 20 °C for 50 or 60 Hz and  $\cos \varphi = 0.9$ :

■ inrush: 1000...1150 VA

■ sealed: 12...18 VA.

Heat dissipation: 14 W.

Operating time at U<sub>c</sub>: closing = 40...75 ms, opening = 100...170 ms.

Operating cycles/hour ( $\theta \leq 55$  °C):  $\leq 2400$ .

(1) Please consult your Regional Sales Office.



## Coils for a.c., 40...400 Hz control voltage

Low sealed consumption.

Operate on networks with harmonic numbers  $\leq 7$ .

Control circuit voltage $U_c$	Average resistance at 20 °C $\pm 10$ %		Inductance of closed circuit H	Voltage code	Reference	Weight kg
	Inrush $\Omega$	Sealed $\Omega$				
V	$\Omega$	$\Omega$	H			kg
<b>For contactor LC1F500</b>						
48	1.9	33.5	0.19	E7	LX1FK048	1.150
110/120	9.55	260	1.25	F7	LX1FK110	1.150
115	9.55	260	1.25	FE7	LX1FK110	1.150
120/127	11.5	315	1.5	G7	LX1FK127	1.150
200/208	29	735	3.75	L7	LX1FK200	1.150
220	35.5	915	4.55	M7	LX1FK220	1.150
230	35.5	915	4.55	P7	LX1FK220	1.150
240	44.5	1160	5.75	U7	LX1FK240	1.150
265/277	56.5	1490	7.3	W7	LX1FK280	1.150
380	112	2980	14.7	Q7	LX1FK380	1.150
400	112	2980	14.7	V7	LX1FK380	1.150
415	143	3730	18.4	N7	LX1FK415	1.150
440	143	3730	18.4	R7	LX1FK415	1.150
500	172	4590	22.8	S7	LX1FK500	1.150
550/600	232	5660	23.9	X7	LX1FK600	1.150
1000	679	16960	72	—	LX1FK1000	1.150

### Specifications

Average consumption at 20 °C for 50 or 60 Hz,  $\cos \varphi = 0.9$ :

■ inrush: 1050...1150 VA,

■ sealed: 16...20 VA.

Operating cycles/hour ( $\theta \leq 55$  °C):  $\leq 2400$ .

Heat dissipation: 18 W.

Operating time at  $U_c$ : closing = 40...75 ms, opening = 100...170 ms.

<b>For contactors LC1F630 and LC1F1250</b>						
48	1.1	17.1	0.09	E7	LX1FL048 <sup>(1)</sup>	1.500
110/120	6.45	165	1.85	F7	LX1FL110	1.500
115	6.45	165	1.85	FE7	LX1FL110	1.500
127	8.1	205	1.05	G7	LX1FL127	1.500
200/208	20.5	605	2.65	L7	LX1FL200	1.500
220	25.5	730	3.35	M7	LX1FL220	1.500
230	25.5	730	3.35	P7	LX1FL220	1.500
240	25.5	730	3.35	U7	LX1FL220	1.500
265/277	31	900	4.1	W7	LX1FL260	1.500
380	78	2360	10.5	Q7	LX1FL380	1.500
400	78	2360	10.5	V7	LX1FL380	1.500
415	96	2960	13	N7	LX1FL415	1.500
440	96	2960	13	R7	LX1FL415	1.500
500	120	3660	16.5	S7	LX1FL500	1.500
550/600	155	4560	19.5	X7	LX1FL600	1.500
1000	474	12880	56.2	—	LX1FL1000 <sup>(1)</sup>	1.500

<sup>(1)</sup> Incompatible with LC1F1250.

### Specifications

Average consumption at 20 °C for 50 or 60 Hz,  $\cos \varphi = 0.9$ :

■ inrush: 1500...1730 VA,

■ sealed: 20...25 VA.

Operating cycles/hour ( $\theta \leq 55$  °C): 1200.

Heat dissipation: 20 W.

Operating time at  $U_c$ : closing = 40...80 ms, opening = 100...200 ms.



LX1FK...



LX1FL...



### Specifications

Average consumption at 20 °C for 50 or 60 Hz,  
cos  $\varphi$  = 0.9:

■ inrush: 1900...2300 VA, sealed: 44...55 VA.  
Operating cycles/hour ( $\theta \leq 55$  °C): 600.

Heat dissipation: 2 x 22 W.

Operating time at  $U_c$ : closing = 40...80 ms,  
opening = 130...230 ms.



LX1FX...

### Specifications

Operating cycles/hour ( $\theta \leq 55$  °C): 600.

Average consumption at 20 °C for 50 or 60 Hz,  
cos  $\varphi$  = 0.8:

■ inrush: 1700 VA, sealed: 12 VA.

Operating time at  $U_c$ : closing = 60...80 ms,  
opening = 160...180 ms.

### Specifications

Average consumption at 20 °C for 50 or 60 Hz,  
cos  $\varphi$  = 0.9:

■ inrush: 1600...2400 VA, sealed: 29...37 VA.  
Operating cycles/hour ( $\theta \leq 55$  °C): 600.

Heat dissipation: 2 x 18 W.

Operating time at  $U_c$ : closing = 40...75 ms,  
opening = 100...170 ms.



LX1FK...

### Specifications

Average consumption at 20 °C for 50 or 60 Hz,  
cos  $\varphi$  = 0.9:

■ inrush: 2200...2700 VA, sealed: 37.4...50.6 VA.  
Operating cycles/hour ( $\theta \leq 55$  °C): 600.

Heat dissipation: 2 x 25 W.

Operating time at  $U_c$ : closing = 40...80 ms,  
opening = 100...200 ms.



LX1FL...

(1) Reference of set of 2 identical coils, to be connected in series.

(2) Value for the 2 coils in series.

(3) Order 2 coils and connect them in series.

## Coils for a.c., 40...400 Hz control voltage

Low sealed consumption.

Operate on networks with harmonic numbers  $\leq 7$ .

Control circuit voltage $U_c$	Average resistance at 20 °C $\pm 10$ %		Inductance of closed circuit	Voltage code	Reference	Weight
	Inrush	Sealed				
V	$\Omega$	$\Omega$	H			kg
For contactor LC1F780						
110/120	4.95 <sup>(2)</sup>	230 <sup>(2)</sup>	0.21	F7	LX1FX110 <sup>(1)</sup>	3.000
115	4.95 <sup>(2)</sup>	230 <sup>(2)</sup>	0.21	FE7	LX1FX110 <sup>(1)</sup>	3.000
127	6.1 <sup>(2)</sup>	280 <sup>(2)</sup>	0.26	G7	LX1FX127 <sup>(1)</sup>	3.000
200/208	15.5 <sup>(2)</sup>	750 <sup>(2)</sup>	0.66	L7	LX1FX200 <sup>(1)</sup>	3.000
220	19.5 <sup>(2)</sup>	920 <sup>(2)</sup>	0.82	M7	LX1FX220 <sup>(1)</sup>	3.000
230	19.5 <sup>(2)</sup>	920 <sup>(2)</sup>	0.82	P7	LX1FX220 <sup>(1)</sup>	3.000
240	19.5 <sup>(2)</sup>	920 <sup>(2)</sup>	0.82	U7	LX1FX220 <sup>(1)</sup>	3.000
265/277	29.8 <sup>(2)</sup>	1330 <sup>(2)</sup>	1.25	W7	LX1FX280 <sup>(1)</sup>	3.000
380	60.9 <sup>(2)</sup>	2780 <sup>(2)</sup>	2.3	Q7	LX1FX380 <sup>(1)</sup>	3.000
400	60.9 <sup>(2)</sup>	2780 <sup>(2)</sup>	2.3	V7	LX1FX380 <sup>(1)</sup>	3.000
415/480	74.3 <sup>(2)</sup>	3340 <sup>(2)</sup>	2.8	N7	LX1FX415 <sup>(1)</sup>	3.000
440	74.3 <sup>(2)</sup>	3340 <sup>(2)</sup>	2.8	R7	LX1FX415 <sup>(1)</sup>	3.000
500	92 <sup>(2)</sup>	4180 <sup>(2)</sup>	3.5	S7	LX1FX500 <sup>(1)</sup>	3.000

Control circuit voltage $U_c$	Voltage code	Rectifier Reference	Coil Reference	Weight
V				kg
For contactor LC1F800				
110/127	FW	DR5TE4U	LX4F8FW	1.650
220/240	MW	DR5TE4U	LX4F8MW	1.650
380/400	QW	DR5TE4S	LX4F8QW	1.650

Control circuit voltage $U_c$	Average resistance at 20 °C $\pm 10$ %		Inductance of closed circuit	Voltage code	Reference	Weight
	Inrush	Sealed				
V	$\Omega$	$\Omega$	H			kg
For contactor LC1F1000						
110	4.718	98.4	0.63	F7	LX1FK055 <sup>(3)</sup>	1.150
120	5.92	106	0.72	G7	LX1FK065 <sup>(3)</sup>	1.150
For contactors LC1F1400, LC1F1700 and LC1F2100						
110	5.92	106	0.72	F7	LX1FK065 <sup>(3)</sup>	1.150
120	5.92	106	0.72	G7	LX1FK070 <sup>(3)</sup>	1.150
For contactors LC1F1000, LC1F1400, LC1F1700 and LC1F2100						
220	9.55	260	1.25	M7	LX1FK110 <sup>(3)</sup>	1.150
230	9.55	260	1.25	P7	LX1FK110 <sup>(3)</sup>	1.150
240	11.5	315	1.50	U7	LX1FK127 <sup>(3)</sup>	1.150
277	16.5	420	2.25	W7	LX1FK140 <sup>(3)</sup>	1.150
380	29	735	3.75	Q7	LX1FK200 <sup>(3)</sup>	1.150
400	29	735	3.75	V7	LX1FK200 <sup>(3)</sup>	1.150
415	35.5	915	4.55	N7	LX1FK220 <sup>(3)</sup>	1.150
440	35.5	915	4.55	R7	LX1FK220 <sup>(3)</sup>	1.150
500	44.5	1160	5.75	S7	LX1FK240 <sup>(3)</sup>	1.150

Control circuit voltage $U_c$	Average resistance at 20 °C $\pm 10$ %		Inductance of closed circuit	Voltage code	Reference	Weight
	Inrush	Sealed				
V	$\Omega$	$\Omega$	H			kg
For contactors LC1F2600						
110	2.05	41	0.18	F7	LX1FL065 <sup>(3)</sup>	1.150
120	2.05	41	0.18	G7	LX1FL065 <sup>(3)</sup>	1.150
220	6.45	165	0.76	M7	LX1FL110 <sup>(3)</sup>	1.150
230	6.45	165	0.76	P7	LX1FL110 <sup>(3)</sup>	1.150
240	8.1	205	1.05	U7	LX1FL127 <sup>(3)</sup>	1.150
277	10.2	317	1.45	W7	LX1FL140 <sup>(3)</sup>	1.150
380	20.5	605	2.65	Q7	LX1FL200 <sup>(3)</sup>	1.150
400	20.5	605	2.65	V7	LX1FL200 <sup>(3)</sup>	1.150
415	25.5	730	3.35	N7	LX1FL220 <sup>(3)</sup>	1.150
440	25.5	730	3.35	R7	LX1FL220 <sup>(3)</sup>	1.150
500	30.8	901	4.13	S7	LX1FL260 <sup>(3)</sup>	1.150



**Coils for specific applications <sup>(1)</sup>****a.c., 40...400 Hz control voltage**

Low sealed consumption.

High tolerance to inrush voltage drops.

Immune to micro-breaks (mains supply or contact chain).

Operate on networks with harmonic numbers  $\leq 7$ .

Control circuit voltage Uc	Average resistance at 20 °C $\pm 10$ %		Inductance of closed circuit	Voltage code	Reference
	Inrush	Sealed			
V	$\Omega$	$\Omega$	H		
<b>For contactors LC1F265 and LC1F330</b>					
48	2.96	72	<sup>(2)</sup>	–	<b>LX9FH0482</b>
110/115	18.7	415	<sup>(2)</sup>	–	<b>LX9FH1102</b>
120/127	22.9	156	<sup>(2)</sup>	–	<b>LX9FH1272</b>
220/230	71.6	1621	<sup>(2)</sup>	–	<b>LX9FH2202</b>
240	88	1968	<sup>(2)</sup>	–	<b>LX9FH2402</b>
380/415	222	5075	<sup>(2)</sup>	–	<b>LX9FH3802</b>
500	345	7990	<sup>(2)</sup>	–	<b>LX9FH5002</b>

**Specifications**

Average consumption at 20 °C: inrush: 560...660 VA, sealed: 8...10 VA.

Heat dissipation: 8.4...10.4 W.

Operating cycles/hour ( $\theta \leq 55$  °C): < 3600.

Operating time at Uc: closing = 45 ms, opening = 25 ms.

<sup>(1)</sup> Application examples: hoisting (inching, high operating rates), Main-Standby (unstable mains supplies). These coils are particularly suited for use at higher operating temperatures (mounting in non-ventilated compartments, enclosures, etc.).

<sup>(2)</sup> Please consult your Regional Sales Office.





## Coils for specific applications a.c., 40...400 Hz control voltage

These coils are particularly suited for use at higher operating temperatures (mounting in non-ventilated compartments, enclosures, etc).

Application examples: hoisting (inching, high operating rates), Main-Standby (unstable mains supplies).

Coils with short operating times (at  $U_c$ ):

- Closing: 60 ms
- Opening: 50 ms ( $\sim$  side); 20 ms ( $\dashv$  side).

Coils with high operating rates ( $\theta \leq 70^\circ\text{C}$ ):

- 3600 operating cycles/hour
- 1800 for LC1F630.

Coils with low inrush consumption.

Control circuit voltage $U_c$	Average resistance at $20^\circ\text{C} \pm 10\%$		Inductance of closed circuit	Rectifier Reference <sup>(1)</sup>	Coil Reference	Weight
	Inrush	Sealed				
V	$\Omega$	$\Omega$	H			kg
<b>For contactor LC1F400</b>						
48	4.03	43	0.22	DR5TF4V	LX9FJ917	0.970
110	25.7	246	1.3	DR5TE4U	LX9FJ925	0.970
127	32.3	302	1.7	DR5TE4U	LX9FJ926	0.970
220/230	99.5	919	5	DR5TE4U	LX9FJ931	0.970
380/415	311	3011	15	DR5TE4S	LX9FJ936	0.970
440	386	3690	19	DR5TE4S	LX9FJ937	0.970
500	478	4380	23	DR5TE4S	LX9FJ938	0.970

### Specifications

Average consumption:

- inrush: 500 VA
- sealed: 23 VA.

Heat dissipation: 11.4...13.9 W.

<b>For contactor LC1F500</b>						
48	3.73	30.7	0.18	DR5TF4V	LX9FK917	1.080
110	24	204	1.1	DR5TE4U	LX9FK925	1.080
127	29.8	250	1.4	DR5TE4U	LX9FK926	1.080
220/230	89.9	770	4	DR5TE4U	LX9FK931	1.080
380/415	274	2075	12	DR5TE4S	LX9FK936	1.080
440	361	3060	16	DR5TE4S	LX9FK937	1.080
500	448	3750	19	DR5TE4S	LX9FK938	1.080

### Specifications

Average consumption:

- inrush: 550 VA
- sealed: 31 VA.

Heat dissipation: 15...18.3 W.

<b>For contactor LC1F630</b>						
48	2.81	20.8	0.17	DR5TF4V	LX9FL917	1.450
110	13.5	114	0.77	DR5TE4U	LX9FL924	1.450
127	20.8	167	1.2	DR5TE4U	LX9FL926	1.450
220	52	425	2.9	DR5TE4U	LX9FL930	1.450
220/240	64.5	518	3.6	DR5TE4U	LX9FL931	1.450
380/400	163	1360	8.8	DR5TE4S	LX9FL935	1.450
415/440	204	1670	11	DR5TE4S	LX9FL936	1.450
500	312	2510	17	DR5TE4S	LX9FL938	1.450

### Specifications

Average consumption:

- inrush: 830 VA
- sealed: 47 VA.

Heat dissipation: 22.8...27.8 W.

<sup>(1)</sup> Rectifier to be ordered separately: 0.100 kg.



PB112335.eps

LX9FJ...



PB112336.eps

LX9FK...



PB112337.eps

LX9FL...





LX4FF...

## Coils for d.c. control voltage

Low sealed consumption.

Control circuit voltage Uc	Average resistance at 20 °C ±10 %		Inductance of closed circuit H	Voltage code	Reference
	Inrush	Sealed			
V	Ω	Ω	H		
<b>For contactors LC1F115 and LC1F150</b>					
24	1.12	177	11	BD	LX4FF024
48	4.52	715	42.7	ED	LX4FF048
110	21.7	2940	179	FD	LX4FF110
125	26.8	3560	223	GD	LX4FF125
220/230	84	11100	704	MD	LX4FF220
250	105	13000	868	UD	LX4FF250
440/460	301	48200	4000	RD	LX4FF440

### Specifications

Average consumption:

■ inrush: 543...665 W,

■ sealed: 3.94...4.83 W.

Operating time at Uc: closing = 30...40 ms, opening = 30...50 ms.

Operating cycles/hour ( $\theta \leq 55\text{ °C}$ ):  $\leq 2400$ .

<b>For contactors LC1F185 and LC1F225</b>					
24	0.79	169	14.9	BD	LX4FG024
48	3.2	662	55.3	ED	LX4FG048
110	14.9	2810	241	FD	LX4FG110
125	19	3320	289	GD	LX4FG125
220/230	57.7	10200	890	MD	LX4FG220
250	76	12400	1140	UD	LX4FG250
440/460	223	39700	4210	RD	LX4FG440

### Specifications

Average consumption:

■ inrush: 737...902 W,

■ sealed: 4.13...5.07 W.

Operating time at Uc: closing = 30...40 ms, opening = 30...50 ms.

Operating cycles/hour ( $\theta \leq 55\text{ °C}$ ):  $\leq 2400$ .



LX4FH...

<b>For contactors LC1F265 and LC1F330</b>					
24	0.9	192	26.3	BD	LX4FH024
48	3.49	707	92.9	ED	LX4FH048
110	16.8	3180	424	FD	LX4FH110
125	20.8	3840	530	GD	LX4FH125
220/230	65.7	11500	1590	MD	LX4FH220
250	84	13900	1910	UD	LX4FH250
440/460	255	44000	7570	RD	LX4FH440

### Specifications

Average consumption:

■ inrush: 655...803 W,

■ sealed: 3.68...4.53 W.

Operating time at Uc: closing = 40...50 ms, opening = 40...65 ms.

Operating cycles/hour ( $\theta \leq 55\text{ °C}$ ):  $\leq 2400$ .

<b>For contactor LC1F400</b>					
48	2.5	558	56	ED	LX4FJ048
110	12.7	2660	270	FD	LX4FJ110
125	15.8	3130	330	GD	LX4FJ125
220	47	8820	910	MD	LX4FJ220
250	61	10500	1200	UD	LX4FJ250
440	236	33750	4435	RD	LX4FJ440

### Specifications

Average consumption:

■ inrush: 920...1140 W,

■ sealed: 4...7.5 W.

Operating time at Uc: closing = 50...60 ms, opening = 45...60 ms.

Operating cycles/hour ( $\theta \leq 55\text{ °C}$ ):  $\leq 2400$ .





LX4FK...

#### LX4FK specifications

Average consumption:

- inrush: 990...1220 W,
- sealed: 4.54...8 W.

Operating cycles/hour ( $\theta \leq 55^\circ\text{C}$ ): 2400.

Operating time at  $U_c$ : closing = 50...60 ms, opening = 45...60 ms.

#### LXE specifications

Average consumption:

- inrush 50/60 Hz: 280...730 VA rms  
DC: 270...680 W,
- sealed: 50/60 Hz: 4.5...10 VA rms  
DC: 2.5...5.5 W.

Heat Dissipation: 2.5...5.5 W

Operating cycles/hour ( $\theta \leq 55^\circ\text{C}$ ): < 2400.

Operating time at  $U_c$ : closing = 40...80 ms, opening = 6...54 ms.

Embedded PLC input according IEC 61131-2 type 2:

- Off state: 0...5 V DC
- On state: 11...30 V DC.

#### LX4FL specifications

Average consumption:

- inrush: 1420...1920 W,
- sealed: 6.5...12.5 W.

Operating cycles/hour ( $\theta \leq 55^\circ\text{C}$ ): 1200.

Operating time at  $U_c$ : closing = 60...70 ms, opening = 40...50 ms.

#### LX4FX specifications

Average consumption:

- inrush: 1960...2420 W
- sealed: 42...52 W.

Operating cycles/hour ( $\theta \leq 55^\circ\text{C}$ ): 600.

Operating time at  $U_c$ : closing = 70...80 ms, opening = 100...130 ms.

#### LX4F8 specifications

Heat dissipation: 25 W.

Operating time at  $U_c$ : closing = 60...80 ms, opening = 40...50 ms.

#### LX4FK specifications

with LC1F1000, 1400, 1700, 2100

Average consumption:

- inrush: 2000...2200 W,
- sealed: 8...10 W.

Operating cycles/hour ( $\theta \leq 55^\circ\text{C}$ ): 600.

Operating time at  $U_c$ : closing = 50...60 ms, opening = 45...60 ms.

#### LX4FL specifications with LC1F2600

Average consumption:

- inrush: 2130...2880 W
- sealed: 13...25 W.

Operating cycles/hour ( $\theta \leq 55^\circ\text{C}$ ): 600.

Operating time at  $U_c$ : closing = 60...70 ms, opening = 40...50 ms.

## Coils for d.c. control voltage

Low sealed consumption.

Control circuit voltage $U_c$	Average resistance at $20^\circ\text{C} \pm 10\%$		Inductance of closed circuit	Voltage code	Reference	Weight
	Inrush	Sealed				
V	$\Omega$	$\Omega$	H			kg
<b>For contactor LC1F500</b>						
48	2.35	515	67	ED	LX4FK048	1.080
110	11.5	2450	280	FD	LX4FK110	1.080
125	15	2930	400	GD	LX4FK125	1.080
220	44	8150	1080	MD	LX4FK220	1.080
250	56	9650	1350	UD	LX4FK250	1.080
440	225	31300	5270	RD	LX4FK440	1.080

### For contactors LC1F500 to LC1F1250 <sup>(1)</sup>

#### For contactors LC1F115 and LC1F150

100...250 $\sim$	8.66	—	—	KUE	LXEFF250	1.100
100...380 $\sim$	—	—	—	—	—	—

#### For contactors LC1F185 and LC1F225

100...250 $\sim$	9.06	—	—	KUE	LXEFG250	1.100
100...380 $\sim$	—	—	—	—	—	—

#### For contactors LC1F265 and LC1F330

100...250 $\sim$	7.62	—	—	KUE	LXEFH250	1.100
100...380 $\sim$	—	—	—	—	—	—

#### For contactor LC1F400

100...250 $\sim$	7.8	—	—	KUE	LXEFJ250	1.100
100...380 $\sim$	—	—	—	—	—	—

#### For contactors LC1F500 and LC1SF1200

100...250 $\sim$	8	—	—	KUE	LXEFK250	1.100
100...380 $\sim$	—	—	—	—	—	—

#### For contactors LC1F630 and LC1F1250

100...250 $\sim$	4.78	—	—	KUE	LXEFL250	1.100
100...380 $\sim$	—	—	—	—	—	—

#### For contactor LC1F800

100...250 $\sim$	4.78	—	—	KUE	LXEFW250	1.100
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### For contactors LC1F630 and LC1F1250

48	1.7	353	40.5	ED	LX4FL048	1.450
110	8.1	1680	180	FD	LX4FL110	1.450
125	10	2110	230	GD	LX4FL125 <sup>(2)</sup>	1.450
220	31	5160	650	MD	LX4FL220	1.450
250	38	6080	815	UD	LX4FL250	1.450
440	152	23120	2910	RD	LX4FL440 <sup>(2)</sup>	1.450

### For contactor LC1F780

110	6.1 <sup>(4)</sup>	280 <sup>(4)</sup>	0.26	FD	LX4FX110 <sup>(3)</sup>	3.000
125	7.7 <sup>(4)</sup>	410 <sup>(4)</sup>	0.33	GD	LX4FX125 <sup>(3)</sup>	3.000
220	24.6 <sup>(4)</sup>	1100 <sup>(4)</sup>	1	MD	LX4FX220 <sup>(3)</sup>	3.000
250	29.8 <sup>(4)</sup>	1330 <sup>(4)</sup>	1.25	UD	LX4FX250 <sup>(3)</sup>	3.000
440	92 <sup>(4)</sup>	4180 <sup>(4)</sup>	3.5	RD	LX4FX440 <sup>(3)</sup>	3.000

### For contactor LC1F800

110/120	—	—	—	FW	LX4F8FW	1.650
220/240	—	—	—	MW	LX4F8MW	1.650
380/400	—	—	—	QW	LX4F8QW	1.650

### For contactors LC1F1000, LC1F1400, LC1F1700 and LC1F2100

110	2.94	734	98	FD	LX4FK055 <sup>(5)</sup>	1.080
125	3.73	916	122	GD	LX4FK065 <sup>(5)</sup>	1.080
220	11.5	2450	280	MD	LX4FK110 <sup>(5)</sup>	1.080
250	15	2930	400	UD	LX4FK125 <sup>(5)</sup>	1.080
440	44	8150	1080	RD	LX4FK220 <sup>(5)</sup>	1.080

### For contactor LC1F2600

110	2.05	481	64	FD	LX4FL055 <sup>(5)</sup>	1.080
125	2.53	603	80	GD	LX4FL065 <sup>(5)</sup>	1.080
220	11.5	2450	280	MD	LX4FL110 <sup>(5)</sup>	1.080
250	15	2930	400	UD	LX4FL125 <sup>(5)</sup>	1.080
440	44	8150	1080	RD	LX4FL220 <sup>(5)</sup>	1.080

<sup>(1)</sup> LXE coil to be used along with suitable Electronic Control Module (ECM) Ref. LA4EM...  
For details, please refer to page B9/14.

<sup>(2)</sup> Incompatible with LC1F1250.

<sup>(3)</sup> Reference of set of 2 identical coils, to be connected in series.

<sup>(4)</sup> Value for the 2 coils in series.

<sup>(5)</sup> Order 2 coils and connect them in series.



## Coils for d.c. control voltage

Coils with short operating times (at  $U_c$ ):

■ Opening: 60 ms

■ Closing: 20 ms.

Coils with high operating rates ( $\theta \leq 70^\circ\text{C}$ ):

■ 3600 operating cycles/hour

■ 1800 for LC1F630.

Coils with low inrush consumption.

Control circuit voltage $U_c$	Average resistance at $20^\circ\text{C} \pm 10\%$		Induc- tance of closed circuit	Resistor <sup>(1)</sup> Qty required	Reference	Coil Reference	Weight
	Inrush	Sealed					
V	$\Omega$	$\Omega$	H				kg
<b>For contactor LC1F400</b>							
48	5.11	99	0.27	1	DR2SC0047	LX9FJ918	0.970
110	32.3	632	1.7	1	DR2SC0330	LX9FJ926	0.970
125	39.4	760	2	1	DR2SC0390	LX9FJ927	0.970
220	123	2320	6.1	1	DR2SC1200	LX9FJ932	0.970
440/460	478	9080	23	1	DR2SC4700	LX9FJ938	0.970

## Specifications

Average consumption:

■ inrush: 430 W

■ sealed: 22 W.

<b>For contactor LC1F500</b>							
48	4.67	76.7	0.22	1	DR2SC0039	LX9FK918	1.080
110	29.8	470	1.4	1	DR2SC0220	LX9FK926	1.080
125	37.4	637	1.7	1	DR2SC0330	LX9FK927	1.080
220	115	1935	5.1	1	DR2SC1000	LX9FK932	1.080
440/460	448	7050	19	1	DR2SC3300	LX9FK938	1.080

## Specifications

Average consumption:

■ inrush: 470 W

■ sealed: 29 W.

<b>For contactor LC1F630</b>							
48	3.43	52.9	0.20	2	DR2SC0047	LX9FL918	1.450
110	17.2	272	0.98	2	DR2SC0270	LX9FL925	1.450
125	20.8	333	1.2	2	DR2SC0330	LX9FL926	1.450
220	64.5	1018	3.6	2	DR2SC1000	LX9FL931	1.450
440/460	260	4010	14	2	DR2SC3900	LX9FL937	1.450

## Specifications

Average consumption:

■ inrush: 733 W

■ sealed: 48 W.

<sup>(1)</sup> Resistor to be ordered separately, weight of resistor: 0.030 kg.



PB112335.eps

LX9FJ...



PB112336.eps

LX9FK...



PB112337.eps

LX9FL...



PB112324.epa



LX4FF●●●

PB112326.epa



LX4FH●●●

## Coils for wide range d.c. control voltage

Wide range coils: 0.7...1.25 Uc.

Operating cycles/hour: ≤ 60 <sup>(1)</sup>.

Ambient temperature (operation): -55 to + 70 °C.

Control circuit voltage Uc	Average resistance at 20 °C ±10 %		Inductance of closed circuit	Reference
	Inrush	Sealed		
V	Ω	Ω	H	
<b>For contactors LC1F115 and LC1F150</b>				
24	0.71	120	7.4	<b>LX4FF020</b>
48	2.86	392	27	<b>LX4FF040</b>
72	7.05	1055	66	<b>LX4FF060</b>
110	13.2	1970	121	<b>LX4FF090</b>
125	16.9	2340	149	<b>LX4FF100</b>

### Specifications

Average consumption:

■ inrush: 415...1300 W

■ sealed: 3...9 W.

<b>For contactors LC1F185 and LC1F225</b>				
24	0.52	112	9.3	<b>LX4FG020</b>
48	2	359	34.4	<b>LX4FG040</b>
72	5.07	984	85	<b>LX4FG060</b>
110	9.66	1840	157	<b>LX4FG090</b>
125	12	2230	196	<b>LX4FG100</b>

### Specifications

Average consumption:

■ inrush: 580...1820 W

■ sealed: 3.1...9.5 W.

<b>For contactors LC1F265 and LC1F330</b>				
24	0.58	129	17.3	<b>LX4FH020</b>
48	2.19	400	59.5	<b>LX4FH040</b>
72	5.58	1110	149	<b>LX4FH060</b>
110	11	2120	287	<b>LX4FH090</b>
125	13.8	2520	353	<b>LX4FH100</b>

### Specifications

Average consumption:

■ inrush: 515...1600 W

■ sealed: 2.7...8.5 W.

Opera- tional voltage	Average resistance at 20 °C ±10 %	Induc- tance of closed circuit	Coil		Economy resistor Resistors in //		Reference of the assembly <sup>(2)</sup>
			Reference	No.	Ω	Reference	
V	Ω	H					
<b>For contactor LC1F400</b>							
24	1.05	0.049	<b>LX2FJW11</b>	3	56	<b>DR2SC0056</b>	<b>LX5FJW11</b>
48	4.8	0.22	<b>LX2FJW18</b>	3	220	<b>DR2SC0220</b>	<b>LX5FJW18</b>
72	9.6	0.44	<b>LX2FJW21</b>	3	470	<b>DR2SC0470</b>	<b>LX5FJW21</b>

### Specifications

Average consumption:

■ inrush: 290...860 W

■ sealed: 16...47 W.






<sup>(1)</sup> The mechanical durability of the contactor is limited to 1 million operating cycles.<sup>(2)</sup> The set comprises: 1 coil **LX2FJ** and 3 resistors **DR2SC**.




## Auxiliary contact blocks for TeSys LC1FG 3-pole shockproof contactors

### Instantaneous auxiliary contact blocks

For use in normal operating environments

Number of contacts	Max. number of blocks per contactor Clip-on mounting	Composition	Reference	
		   		
1	1	– – 1 –	<b>LADN10</b>	(1)
		– – – 1	<b>LADN01</b>	(1)
4	1	– – 2 2	<b>LADN22</b>	(1)
		– – 4 –	<b>LADN40</b>	(1)
		– – – 4	<b>LADN04</b>	(1)
		– – 3 1	<b>LADN31</b>	(1)

### Time delay auxiliary contact blocks

Number of contacts	Max. number of blocks per contactor Clip-on mounting	Time delay	Reference	
		Type Range		
		s		
1 N/O	1	On-delay 0...3 (2)	<b>LADT0</b>	
+		1...30	<b>LADT2</b>	(1)
1 N/C		10...180	<b>LADT4</b>	
		1...30 (3)	<b>LADS2</b>	
		Off-delay 0...3 (2)	<b>LADR0</b>	
		1...30	<b>LADR2</b>	(1)
		10...180	<b>LADR4</b>	

(1) Device approved by the DCN (French naval shipyard department) and authorised for on-board use.

(2) With extended scale from 0.1 to 0.6 s.

(3) With switching time of 40 ms ± 15 ms between opening of the N/C contact and closing of the N/O contact.



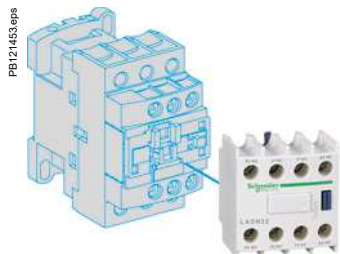
LADN●●



LADT●







LADN



LA9F103



LA9F70



EZ2LB0601

#### Accessories for contactors CR1F

Description	Number of contacts or shrouds	For use on	Reference
Instantaneous auxiliary contacts	(1)	CR1F	LADN●●, LADX●●, LADY●●, LADZ●● (1)
Time delay auxiliary contacts	(1)	CR1F	LADT●, LADS●, LADR● (1)
Contact blocks with protected terminals for 3-pole contactors (for mounting on contactors with closed arc chamber)	Set of 2 blocks	CR1F150 and CR1F185	LA9F103
Power terminal protection shrouds	Set of 6 shrouds for 3-pole contactors	CR1F150 and CR1F185	LA9F702
		CR1F265 to CR1F500	LA9F703
		CR1F630	LA9F704
		CR1F1504 and CR1F1854	LA9F707
	Set of 8 shrouds for 4-pole contactors	CR1F2654 to CR1F5004	LA9F708
		CR1F6304	LA9F709

Description	Application	Reference
Mechanical interlock and power connections	For assembly of reversing contactors and changeover contactor pairs	See pages B9/29 and B9/30

#### Accessories for contactors CR1B

Description	Application	Reference	Weight kg
Mechanical interlock with mounting accessories (2)	For vertical assembly of reversing contactors and changeover contactor pairs	EZ2LB0601	1.560
Kit containing 2 bar mounting brackets	For mounting on 120 or 150 mm centres	LA9B103	1.620

(1) For maximum number per contactor and complete reference, see page B9/11.

(2) Positive mechanical interlocking between 2 vertically mounted contactors of identical or different ratings. Connecting rods and cranks assembled on right-hand sides, crank pins on the pole side.

Vertical fixing centre distance between the two contactors: 600 mm.



#### Control Panel Technical Guide:

Description and product reference of all mounting kits and wiring accessories for TeSys D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011\_EN



> Click on QR code to download



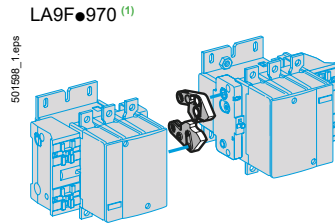
## Reversing and changeover assemblies with CR1F magnetic latching contactors

### Horizontally mounted

#### Mechanical interlocks

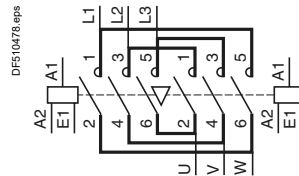
Reversers assembled using 2 contactors of identical rating, type:

- CR1F150
- CR1F185
- CR1F265
- CR1F400
- CR1F500
- CR1F630

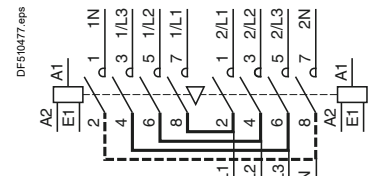


#### Sets of power connections

Reversing contactors  
LA9F●976 (1)



3 or 4-pole changeover contactor pairs  
LA9F●977 (1) or LA9F●982 (1)



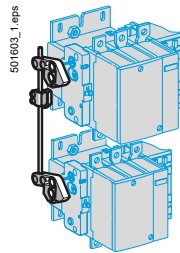
### Vertically mounted

#### Mechanical interlocks

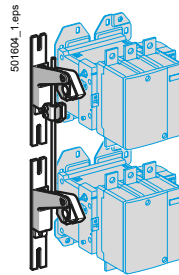
Reversers assembled using 2 contactors of identical rating, type:

- CR1F150
- CR1F185
- CR1F265
- CR1F400
- CR1F500
- CR1F630

LA9FF4F Assembly A  
LA9FG4G



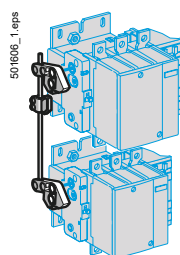
LA9FH4H Assembly C  
LA9FJ4J  
LA9FK4K  
LA9FL4L



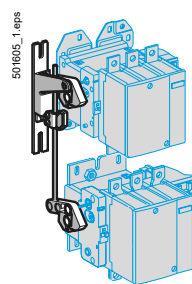
Reversers assembled using 2 contactors of different ratings, type:

- CR1F150
- CR1F185
- CR1F265
- CR1F400
- CR1F500
- CR1F630

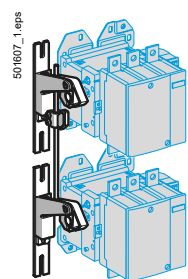
LA9FG4F Assembly A



LA9FH4F Assembly B  
LA9FJ4F  
LA9FK4F  
LA9FL4F  
LA9FH4G  
LA9FJ4G  
LA9FK4G  
LA9FL4G

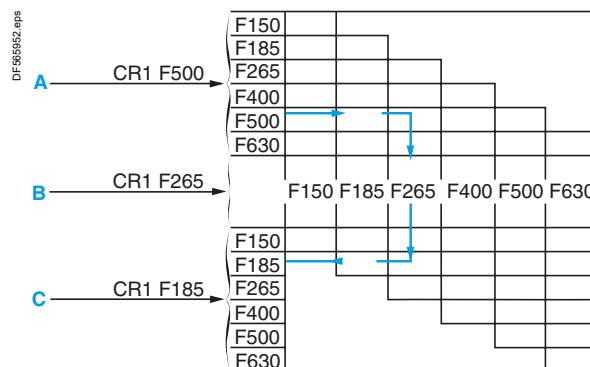
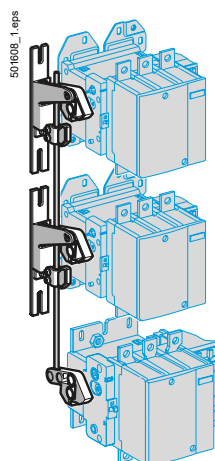


LA9FJ4H Assembly C  
LA9FK4H  
LA9FL4H  
LA9FK4J  
LA9FL4J  
LA9FK4K



Reversers assembled using 3 contactors of identical or different ratings

LA9F●4●4● (2)



**Warning:** the contactor ratings must be in decreasing size from top to bottom.

(1) Complete references: see page B9/35.

(2) Complete references: see pages B9/38 and B9/39.



Reversing and changeover assemblies with CR1F magnetic latching contactors.

### Reversers assembled using 2 contactors of identical rating

Contactor type	Set of power connections			Mechanical interlock	
	3-pole Reference	4-pole Reference	Weight kg	Kit reference	Weight kg
<b>For assembly of 3-pole reversing contactors for motor control <sup>(1)</sup></b>					
<b>Horizontally mounted</b>					
CR1F150	LA9FF976	–	0.600	LA9FF970	0.060
CR1F185	LA9FG976	–	0.780	LA9FG970	0.060
CR1F265	LA9FH976	–	1.500	LA9FJ970	0.140
CR1F400	LA9FJ976	–	2.100	LA9FJ970	0.140
CR1F500	LA9FK976	–	2.350	LA9FJ970	0.140
CR1F630	LA9FL976	–	3.800	LA9FL970	0.150
<b>Vertically mounted</b>					
CR1F150	<sup>(2)</sup>	–	–	LA9FF4F	0.345
CR1F185	<sup>(2)</sup>	–	–	LA9FG4G	0.350
CR1F265	<sup>(2)</sup>	–	–	LA9FH4H	1.060
CR1F400	<sup>(2)</sup>	–	–	LA9FJ4J	1.200
CR1F500	<sup>(2)</sup>	–	–	LA9FK4K	1.200
CR1F630	<sup>(2)</sup>	–	–	LA9FL4L	1.220

### For assembly of 4-pole changeover contactor pairs

<b>Horizontally mounted</b>					
CR1F1504	LA9FF982	LA9FF977	0.460	LA9FF970	0.060
CR1F1854	LA9FG982	LA9FG977	0.610	LA9FG970	0.060
CR1F2654	LA9FH982	LA9FH977	1.200	LA9FJ970	0.140
CR1F4004	LA9FJ982	LA9FJ977	1.800	LA9FJ970	0.140
CR1F5004	LA9FK982	LA9FK977	2.300	LA9FJ970	0.140
CR1F6304	LA9FL982	LA9FL977	3.400	LA9FL970	0.150
<b>Vertically mounted</b>					
CR1F1504	<sup>(2)</sup>	–	–	LA9FF4F	0.345
CR1F1854	<sup>(2)</sup>	–	–	LA9FG4G	0.350
CR1F2654	<sup>(2)</sup>	–	–	LA9FH4H	1.060
CR1F4004	<sup>(2)</sup>	–	–	LA9FJ4J	1.200
CR1F5004	<sup>(2)</sup>	–	–	LA9FK4K	1.200
CR1F6304	<sup>(2)</sup>	–	–	LA9FL4L	1.220

### Reversers assembled using 2 contactors of different ratings

Contactor type			Mechanical interlock	
	At bottom	At top	Kit reference	Weight kg
<b>For assembly of 3 or 4-pole changeover contactor pairs</b>				
<b>Vertically mounted <sup>(3)</sup></b>				
CR1F150 or F1504		CR1F185 or F1854	LA9FG4F	0.350
		CR1F265 or F2654	LA9FH4F	0.870
		CR1F400 or F4004	LA9FJ4F	0.930
		CR1F500 or F5004	LA9FK4F	0.940
		CR1F630 or F6304	LA9FL4F	0.940
CR1F185 or F1854		CR1F265 or F2654	LA9FH4G	0.860
		CR1F400 or F4004	LA9FJ4G	0.940
		CR1F500 or F5004	LA9FK4G	0.940
		CR1F630 or F6304	LA9FL4G	0.950
		CR1F400 or F4004	LA9FJ4H	1.130
CR1F265 or F2654		CR1F500 or F5004	LA9FK4H	1.130
		CR1F630 or F6304	LA9FL4H	1.140
		CR1F400 or F4004	LA9FK4J	1.200
CR1F400 or F4004		CR1F630 or F6304	LA9FL4J	1.210
		CR1F500 or F5004	LA9FK4K	1.210

### For assembly of 3 or 4-pole reversing contactors <sup>(4)</sup>

Using 3 contactors (vertically mounted) of identical or different ratings		Mechanical interlock
		Kit reference <sup>(5)</sup>
The contactor ratings must be in decreasing size from top to bottom.		LA9F●4●4●

Contactors	CR1F150	CR1F185	CR1F265	CR1F400	CR1F500	CR1F630
Code	F	G	H	J	K	L

**Example:** mechanical interlock for reversing contactor made up of 3 different contactors:  
CR1F500 top, CR1F265 middle and CR1F185 bottom: **LA9FK4H4G**.

- (1) A 3-pole reversing contactor for motor control can be converted into a 3-pole changeover contactor pair by removing the upper connecting links.
- (2) All power connections are to be made by the customer.
- (3) With identical or different number of poles. Power connections to be made by the customer.
- (4) Closing of one of the 3 contactors prevents closing of the other 2 contactors.
- (5) Complete the reference by replacing the first dot with the code for the upper contactor, the second dot with the code for the middle contactor and the third dot with the code for the bottom contactor.





PB121414.eps



LA5FG431

PB11605.eps



LA5F11550

References				
Description	For contactor		Reference	Weight kg
Complete sets of contacts for 3 or 4 poles <sup>(1)</sup>	3-pole	CR1F150	LA5FF431	0.270
		CR1F185	LA5FG431	0.350
		CR1F265	LA5FH431	0.660
		CR1F400	LA5F400803	0.660
		CR1F500	LA5F500803	0.660
		CR1F630	LA5F630803	0.660
	4-pole	CR1F1504	LA5FF441	0.360
		CR1F1854	LA5FG441	0.465
		CR1F2654	LA5FH441	0.880
		CR1F4004	LA5F400804	0.465
		CR1F5004	LA5F500804	0.465
		CR1F6304	LA5F630804	0.465
Arc chambers	3-pole	CR1F150	LA5F15050	0.490
		CR1F185	LA5F18550	0.670
		CR1F265	LA5F26550	0.920
		CR1F400	LA5F40050	1.300
		CR1F500	LA5F50050	1.850
		CR1F630	LA5F63050	3.150
	4-pole	CR1F1504	LA5F150450	0.660
		CR1F1854	LA5F185450	0.910
		CR1F2654	LA5F265450	1.220
		CR1F4004	LA5F400450	1.740
		CR1F5004	LA5F500450	2.500
		CR1F6304	LA5F630450	4.200

<sup>(1)</sup> Set containing the following (per pole): 2 fixed contacts, 1 moving contact, 2 deflectors, 1 back-plate, clamping screws and washers.



PB12/14/13.eps



LX0FG007

PB12/14/12.eps



LX0FK006

High power  
contactors

## Standard coils for a.c. or d.c. control voltage

Usual voltages		Resistance of winding at $\theta = 20\text{ }^{\circ}\text{C}$		Reference	Voltage code	Weight kg
50...400 Hz or ---	50 Hz, 60 Hz	Latching	Unlatching			
V	V	$\Omega$	$\Omega$			
For contactors CR1F150						
48	—	1.98	230.8	LX0FF005	E7	0.440
110	—	9.35	1453	LX0FF006	F7	0.440
127	—	11.61	1788	LX0FF007	G7	0.440
208	—	23.50	4098	LX0FF020	L7	0.440
220/230	—	37.55	5139	LX0FF008	M7	0.440
—	240	45.16	6544	LX0FF009	U7	0.440
—	380/400	114.10	12 447	LX0FF010	Q7	0.440
—	415	139.50	16 717	LX0FF011	N7	0.440
For contactors CR1F185						
48	—	1.42	220	LX0FG005	E7	0.560
110	—	6.92	1339	LX0FG006	F7	0.560
127	—	8.45	1676	LX0FG007	G7	0.560
208	—	21.30	3169	LX0FG020	L7	0.560
220/230	—	26.27	4729	LX0FG008	M7	0.560
—	240	32.95	4729	LX0FG009	U7	0.560
—	380/400	82.29	11 885	LX0FG010	Q7	0.560
—	415	102.30	14 305	LX0FG011	N7	0.560
For contactors CR1F265						
48	—	1.34	183.4	LX0FH005	E7	0.780
110	—	6.90	1031	LX0FH006	F7	0.780
127	—	8.56	1325	LX0FH007	G7	0.780
208	—	20.20	2654	LX0FH020	L7	0.780
220/230	—	25.77	4090	LX0FH008	M7	0.780
—	240	33.03	5002	LX0FH009	U7	0.780
—	380/400	78.39	11 803	LX0FH010	Q7	0.780
—	415	102.9	15 006	LX0FH011	N7	0.780
For contactors CR1F400						
48	—	1.32	90.5	LX0FJ005	E7	1.120
110	—	8.09	813	LX0FJ006	F7	1.120
127	—	9.79	1027	LX0FJ007	G7	1.120
208	—	24.40	2643	LX0FJ020	L7	1.120
220/230	—	30.14	3309	LX0FJ008	M7	1.120
—	240	37.02	4074	LX0FJ009	U7	1.120
—	380/400	94.80	9380	LX0FJ010	Q7	1.120
—	415	121.10	11 763	LX0FJ011	N7	1.120
For contactors CR1F500						
48	—	1.57	166	LX0FK005	E7	1.220
110	—	7.53	916	LX0FK006	F7	1.220
127	—	9.56	1159	LX0FK007	G7	1.220
208	—	23.60	2981	LX0FK020	L7	1.220
220/230	—	28.81	3733	LX0FK008	M7	1.220
—	240	35.67	4595	LX0FK009	U7	1.220
—	380/400	89.56	10 570	LX0FK010	Q7	1.220
—	415	112.06	13 256	LX0FK011	N7	1.220
For contactors CR1F630						
48	—	0.87	204	LX0FL005	E7	1.460
110	—	5.20	1423	LX0FL006	F7	1.460
127	—	6.45	1830	LX0FL007	G7	1.460
208	—	20.20	2961	LX0FL020	L7	1.460
220/230	—	25.36	4603	LX0FL008	M7	1.460
—	240	25.36	5658	LX0FL009	U7	1.460
—	380/400	60.95	10 676	LX0FL010	Q7	1.460
—	415	77.97	13 003	LX0FL011	N7	1.460





### Special coils for a.c. or d.c. control voltage

Coils with two windings with common point, allowing the use of two separate power sources for latching and unlatching.

Coil voltages at 50 Hz, 60 Hz, 400 Hz or ---		Resistance of winding at $\theta = 20^\circ\text{C}$		Reference	Voltage code	Weight kg
Latching	Unlatching	Latching	Unlatching			
V	V	$\Omega$	$\Omega$			

#### For contactors CR1F150

220	24	29.5	39.5	LX0FF224	MB7	0.440
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#### For contactors CR1F185

220	24	26.5	19	LX0FG224	MB7	0.560
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#### For contactors CR1F265

220	24	26	29.5	LX0FH224	MB7	0.780
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#### For contactors CR1F400

220	24	30	23	LX0FJ224	MB7	1.120
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#### For contactors CR1F500

220	24	29	26	LX0FK224	MB7	1.220
-----	----	----	----	----------	-----	-------

#### For contactors CR1F630

220	24	26	41	LX0FL224	MB7	1.460
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### Coils with low inrush consumption for d.c. control voltage

Usual voltages ---	Resistance of winding at $\theta = 20^\circ\text{C}$		Reference	Voltage code	Weight kg
	Latching	Unlatching			
V	$\Omega$	$\Omega$			

#### For contactors CR1F150

48	4.56	140.56	LX0FF055	EZ7	0.440
110	22.37	706.44	LX0FF056	FZ7	0.440
127	35.54	1086.36	LX0FF057	GZ7	0.440
220	89.85	3342.51	LX0FF058	MZ7	0.440

#### For contactors CR1F185

48	5.19	106.54	LX0FG055	EZ7	0.570
110	25.50	536.26	LX0FG056	FZ7	0.570
127	32.75	732.64	LX0FG057	GZ7	0.570
220	102.44	2378.62	LX0FG058	MZ7	0.570

#### For contactors CR1F265

48	5.19	74.26	LX0FH055	EZ7	0.800
110	25	364.61	LX0FH056	FZ7	0.800
127	30.98	458.45	LX0FH057	GZ7	0.800
220	97.89	1344.46	LX0FH058	MZ7	0.800

#### For contactors CR1F400

48	5.05	36.36	LX0FJ055	EZ7	1.150
110	25.39	171.49	LX0FJ056	FZ7	1.150
127	31.86	221.20	LX0FJ057	GZ7	1.150
220	98.19	648.79	LX0FJ058	MZ7	1.150

#### For contactors CR1F500

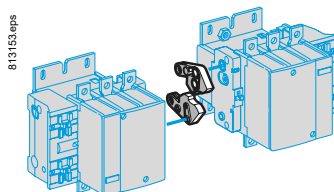
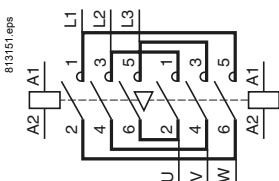

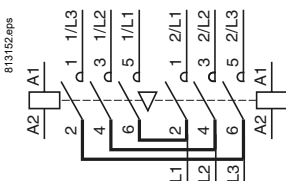

48	4.42	41	LX0FK055	EZ7	1.270
110	22.74	193.36	LX0FK056	FZ7	1.270
127	28.25	313.60	LX0FK057	GZ7	1.270
220	85.12	918.68	LX0FK058	MZ7	1.270

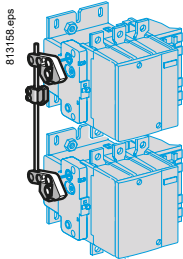
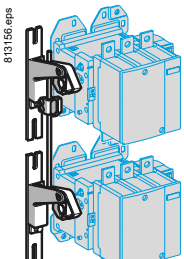
#### For contactors CR1F630

48	3.94	59.17	LX0FL055	EZ7	1.500
110	19.36	365.33	LX0FL056	FZ7	1.500
127	25.39	452.27	LX0FL057	GZ7	1.500
220	74.44	1071.43	LX0FL058	MZ7	1.500



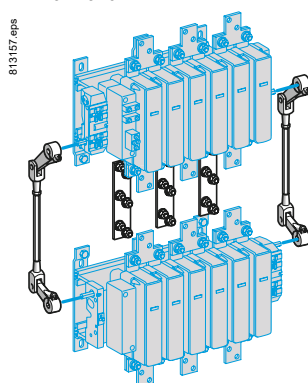
Components for reversing and changeover assemblies of LC1F contactors - 3-pole

Horizontally mounted	Mechanical interlocks	Sets of power connections	
Reversers assembled using 2 contactors of identical rating, type :		Reversing contactors	3-pole changeover contactor pairs <sup>(1)</sup>
<b>LC1F115</b> <b>LC1F150</b> <b>LC1F185</b> <b>LC1F225</b> <b>LC1F265</b> <b>LC1F330</b> <b>LC1F400</b> <b>LC1F500</b> <b>LC1F630</b> <b>LC1F800</b>	<b>LA9F●970</b> <sup>(2)</sup> 	<b>LA9F●●76</b> <sup>(2)</sup>  	<b>LA9F●●82</b> <sup>(2)</sup>  

Vertically mounted	Mechanical interlocks	
Reversers assembled using 2 contactors of identical rating, type :	<b>LA9FF4F</b> <b>LA9FG4G</b>	<b>LA9FH4H</b> <b>LA9FJ4J</b> <b>LA9FK4K</b> <b>LA9FL4L</b>
<b>LC1F115</b> <b>LC1F150</b> <b>LC1F185</b> <b>LC1F225</b> <b>LC1F265</b> <b>LC1F330</b> <b>LC1F400</b> <b>LC1F500</b> <b>LC1F630</b> <b>LC1F800</b> Reversers assembled using 2 contactors of different ratings, see page B9/36		

LC1F780

LA9FX970



<sup>(1)</sup> For 4-pole changeover contactor pairs, see pages B9/36 and B9/37.

<sup>(2)</sup> Complete references: see page B9/35.



#### Control Panel Technical Guide:

Description and product reference of all mounting kits and wiring accessories for TeSys D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011\_EN



> Click on QR code to download



Components for reversing and changeover assemblies of LC1F contactors - 3-pole

**Reversers assembled using 2 contactors of identical rating**

Contactor type <sup>(1)</sup>	Set of power connections		Mechanical interlock	
	Reference	Weight kg	Kit reference	Weight kg
<b>For assembly of 3-pole reversing contactors for motor control</b>				
<b>Horizontally mounted</b>				
LC1F115	LA9FF976	0.600	LA9FF970	0.060
LC1F150	LA9F15076	0.600	LA9FF970	0.060
LC1F185	LA9FG976	0.780	LA9FG970	0.060
LC1F225	LA9F22576	1.500	LA9FG970	0.060
LC1F265	LA9FH976	1.500	LA9FJ970	0.140
LC1F330	LA9FJ976	2.100	LA9FJ970	0.140
LC1F400	LA9FJ976	2.100	LA9FJ970	0.140
LC1F500	LA9FK976	2.350	LA9FJ970	0.140
LC1F630 or F800	LA9FL976	3.800	LA9FL970	0.150
<b>Vertically mounted</b>				
LC1F115 or F150	<sup>(2)</sup>	—	LA9FF4F	0.345
LC1F185	<sup>(2)</sup>	—	LA9FG4G	0.350
LC1F225	<sup>(2)</sup>	—	LA9FG4G	0.350
LC1F265 or F330	<sup>(2)</sup>	—	LA9FH4H	1.060
LC1F400	<sup>(2)</sup>	—	LA9FJ4J	1.200
LC1F500	<sup>(2)</sup>	—	LA9FK4K	1.200
LC1F630 or F800	<sup>(2)</sup>	—	LA9FL4L	1.220
LC1F780	<sup>(3)</sup>	—	LA9FX970 <sup>(3)</sup>	6.100
<b>For assembly of 3-pole changeover contactor pairs <sup>(4)</sup></b>				
<b>Horizontally mounted</b>				
LC1F115	LA9FF982	0.460	LA9FF970	0.060
LC1F150	LA9F15082	0.460	LA9FF970	0.060
LC1F185	LA9FG982	0.610	LA9FG970	0.060
LC1F225	LA9F22582	1.200	LA9FG970	0.060
LC1F265	LA9FH982	1.200	LA9FJ970	0.140
LC1F330	LA9FJ982	1.800	LA9FJ970	0.140
LC1F400	LA9FJ982	1.800	LA9FJ970	0.140
LC1F500	LA9FK982	2.300	LA9FJ970	0.140
LC1F630 or F800	LA9FL982	3.400	LA9FL970	0.150
<b>Vertically mounted</b>				
LC1F115 or F150	<sup>(2)</sup>	—	LA9FF4F	0.345
LC1F185	<sup>(2)</sup>	—	LA9FG4G	0.350
LC1F225	<sup>(2)</sup>	—	LA9FG4G	0.350
LC1F265 or F330	<sup>(2)</sup>	—	LA9FH4H	1.060
LC1F400	<sup>(2)</sup>	—	LA9FJ4J	1.200
LC1F500	<sup>(2)</sup>	—	LA9FK4K	1.200
LC1F630 or F800	<sup>(2)</sup>	—	LA9FL4L	1.220
LC1F780	<sup>(3)</sup>	—	LA9FX970 <sup>(3)</sup>	7.800

<sup>(1)</sup> To order the 2 contactors: see pages B9/2 and B9/3. For the 2 auxiliary contact blocks **LADN•1** required to obtain electrical interlocking between the 2 contactors, see page B9/11. For accessories, see pages B9/12 to B9/14.

<sup>(2)</sup> All power connections are to be made by the customer.

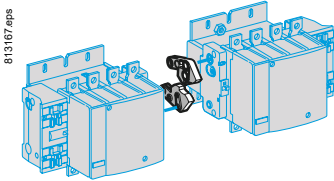
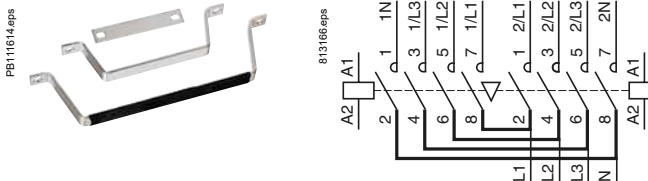
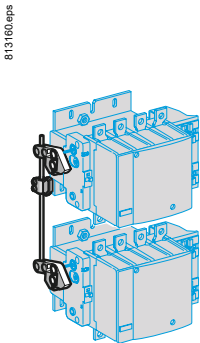
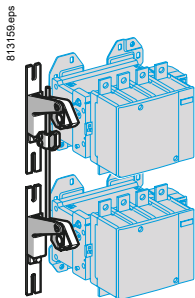
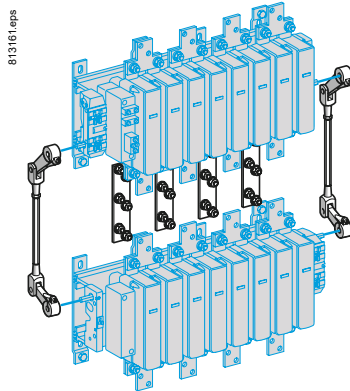
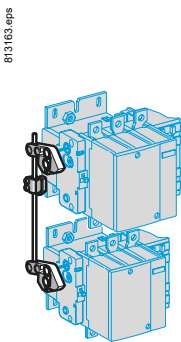
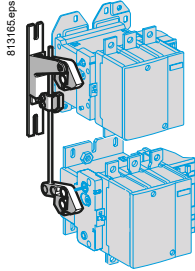
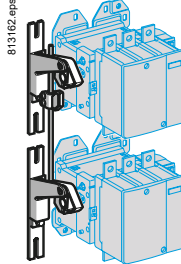
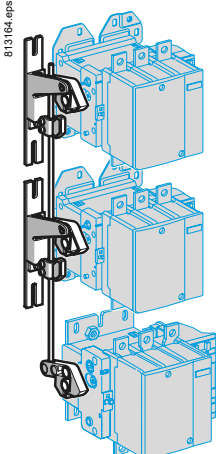

<sup>(3)</sup> Double mechanical interlock mechanism with 2 interlock connecting rods and 3 power connecting links.

<sup>(4)</sup> For assembly of 4-pole changeover contactor pairs, see pages B9/36 and B9/37.





Components for reversing and changeover assemblies of LC1F contactors - 3-pole, 4-pole

Horizontally mounted		Mechanical interlocks		Sets of power connections	
<p>Contactor pairs assembled using 2 contactors of identical rating, type :</p> <p>LC1F1154 LC1F1504 LC1F1854 LC1F2254 LC1F2654 LC1F3304 LC1F4004 LC1F5004 LC1F6304</p>		<p><b>LA9F●970</b> <sup>(2)</sup></p>  <p>813167.eps</p>		<p><b>Sets of power connections</b></p> <p><b>4-pole changeover contactor pairs</b> <sup>(1)</sup></p> <p><b>LA9F●●●77</b> <sup>(2)</sup></p>  <p>PB111614.eps</p>	
Vertically mounted		Mechanical interlocks		Assembly B	
<p>Contactor pairs assembled using 2 contactors of identical rating, type :</p> <p>LC1F1154 LC1F1504 LC1F1854 LC1F2254 LC1F2654 LC1F3304 LC1F4004 LC1F5004 LC1F6304</p>		<p><b>Assembly A</b></p> <p><b>LA9FF4F</b> <b>LA9FG4G</b></p>  <p>813160.eps</p>		<p><b>Assembly B</b></p> <p><b>LA9FH4H</b> <b>LA9FJ4J</b> <b>LA9FK4K</b> <b>LA9FL4L</b></p>  <p>813159.eps</p>	
				<p><b>Assembly C</b></p> <p><b>LA9FX971</b></p>  <p>813161.eps</p>	
<p>Contactor pairs assembled using 2 contactors of different ratings, type :</p> <p>LC1F115 or F1154 LC1F150 or F1504 LC1F185 or F1854 LC1F225 or F2254 LC1F265 or F2654 LC1F330 or F3304 LC1F400 or F4004 LC1F500 or F5004 LC1F630 or F6304 LC1F800</p>		<p><b>Assembly A</b></p> <p><b>LA9FG4F</b></p>  <p>813163.eps</p>		<p><b>Assembly B</b></p> <p><b>LA9FH4F, LA9FH4G</b> <b>LA9FJ4F, LA9FJ4G</b> <b>LA9FK4F, LA9FK4G</b> <b>LA9FL4F, LA9FL4G</b></p>  <p>813165.eps</p>	
				<p><b>Assembly C</b></p> <p><b>LA9FJ4H</b> <b>LA9FK4H, LA9FK4J</b> <b>LA9FL4H, LA9FL4J and LA9FL4K</b></p>  <p>813162.eps</p>	
<p>Contactor pairs assembled using 3 contactors of identical or different ratings, type :</p> <p>LC1F115 or F1154 LC1F150 or F1504 LC1F185 or F1854 LC1F225 or F2254 LC1F265 or F2654 LC1F330 or F3304 LC1F400 or F4004 LC1F500 or F5004 LC1F630 or F6304 LC1F800</p>		<p><b>LA9F●4●4●</b> : see pages B9/38 and B9/39.</p>  <p>813164.eps</p>		<p><b>Control Panel Technical Guide:</b></p> <p>Description and product reference of all mounting kits and wiring accessories for TeSys D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.</p> <p>&gt; Ref. Document: CPTG011_EN</p>  <p>&gt; Click on QR code to download</p>	

(1) For 3-pole changeover contactor pairs, see pages B9/34 and B9/35.  
(2) Complete references: see page B9/37.

**Important:** the contactor ratings must be in decreasing size from top to bottom.



Components for reversing and changeover assemblies of LC1F contactors  
3-pole, 4-pole.

### Contactors pairs assembled using 2 contactors of identical rating

#### For assembly of 4-pole changeover contactor pairs <sup>(1)</sup>

Contactor type <sup>(2)</sup>	Set of power connections		Mechanical interlock	
	Reference	Weight kg	Kit reference	Weight kg
<b>Horizontally mounted</b>				
LC1F1154	LA9FF977	0.460	LA9FF970	0.060
LC1F1504	LA9F15077	0.460	LA9FF970	0.060
LC1F1854	LA9FG977	0.610	LA9FG970	0.060
LC1F2254	LA9F22577	1.200	LA9FG970	0.060
LC1F2654	LA9FH977	1.200	LA9FJ970	0.140
LC1F3304	LA9FJ977	1.800	LA9FJ970	0.140
LC1F4004	LA9FJ977	1.800	LA9FJ970	0.140
LC1F5004	LA9FK977	2.300	LA9FJ970	0.140
LC1F6304	LA9FL977	3.400	LA9FL970	0.150

#### Vertically mounted

LC1F1154 or F1504	<sup>(3)</sup>	—	LA9FF4F	0.345
LC1F1854	<sup>(3)</sup>	—	LA9FG4G	0.350
LC1F2254	<sup>(3)</sup>	—	LA9FG4G	0.350
LC1F2654 or F3304	<sup>(3)</sup>	—	LA9FH4H	1.060
LC1F4004	<sup>(3)</sup>	—	LA9FJ4J	1.200
LC1F5004	<sup>(3)</sup>	—	LA9FK4K	1.200
LC1F6304	<sup>(3)</sup>	—	LA9FL4L	1.220
LC1F7804	<sup>(4)</sup>	—	LA9FX971 <sup>(4)</sup>	7.800

### Contactors pairs assembled using 2 contactors of different ratings

#### For assembly of 3 or 4-pole changeover contactor pairs

Contactor type <sup>(1)</sup>		Mechanical interlock	
At bottom	At top	Kit reference	Weight kg
<b>Vertically mounted</b>			
LC1F115 or F1154 or LC1F150 or F1504	LC1F185 or F1854	LA9FG4F	0.350
	LC1F225 or F2254	LA9FG4F	0.350
	LC1F265 or F2654	LA9FH4F	0.870
	LC1F330 or F3304	LA9FH4F	0.870
	LC1F400 or F4004	LA9FJ4F	0.930
	LC1F500 or F5004	LA9FK4F	0.940
LC1F185 or F1854 or LC1F225 or F2254	LC1F630, F6304 or F800	LA9FL4F	0.940
	LC1F265 or F2654	LA9FH4G	0.860
	LC1F330 or F3304	LA9FH4G	0.860
	LC1F400 or F4004	LA9FJ4G	0.940
	LC1F500 or F5004	LA9FK4G	0.940
	LC1F630, F6304 or F800	LA9FL4G	0.950
LC1F265 or F2654 or LC1F330 or F3304	LC1F400 or F4004	LA9FJ4H	1.130
	LC1F500 or F5004	LA9FK4H	1.130
	LC1F630, F6304 or F800	LA9FL4H	1.140
LC1F400 or F4004	LC1F500 or F5004	LA9FK4J	1.200
	LC1F630 or F6304 or F800	LA9FL4J	1.210
LC1F500 or F5004	LC1F630 or F6304 or F800	LA9FL4K	1.210

#### For assembly of reversers using 3 contactors, vertically mounted

See pages B9/38 and B9/39.

<sup>(1)</sup> For assembly of 3-pole changeover contactor pairs, see pages B9/34 and B9/35.

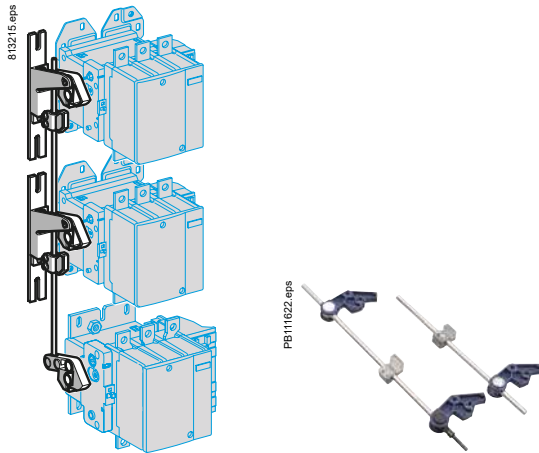
<sup>(2)</sup> To order the 2 contactors: see pages B9/2 and B9/3. For the 2 auxiliary contact blocks **LADN•1** required to obtain electrical interlocking between the 2 contactors, see page B9/11. For accessories, see pages B9/12 to B9/14.

<sup>(3)</sup> All power connections are to be made by the customer.

<sup>(4)</sup> Double mechanical interlock mechanism with 2 interlock connecting rods and 4 power connecting links.







Example of assembly using LA9FH4H4G kit (2 right-angled mounting brackets included)

LA9FF444 to LA9FG444

Components for reversing and changeover assemblies of 3 LC1F contactors - 3-pole, 4-pole.

Closing of one of the 3 contactors prevents closing of the other 2.

### Mechanical interlock kits

#### Vertically mounted

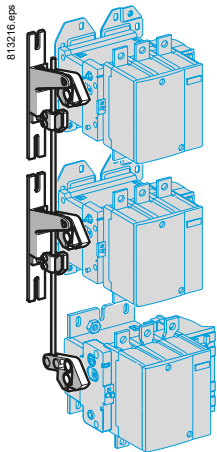
Contactor type <sup>(1)</sup>			Mechanical interlock <sup>(2)</sup>	
Top	Middle	Bottom	Kit reference <sup>(3)</sup>	Weight kg
LC1F115, F150, F1154 or F1504	LC1F115, F150, F1154 or F1504	LC1F115, F150, F1154 or F1504	LA9FF4F4F	0.554
		LC1F185, F225, F1854 or F2254	LA9FG4F4F	0.559
		LC1F115, F150, F1154 or F1504	LA9FG4G4F	0.559
LC1F185, F225, F1854 or F2254	LC1F185, F225, F1854 or F2254	LC1F185, F225, F1854 or F2254	LA9FG4G4G	0.562
		LC1F115, F150, F1154 or F1504	LA9FH4F4F	1.350
		LC1F115, F150, F1154 or F1504	LA9FH4G4F	1.375
LC1F265, F330, F2654 or F3304	LC1F115, F150, F1154 or F1504	LC1F115, F150, F1154 or F1504	LA9FH4G4G	1.375
		LC1F185, F225, F1854 or F2254	LA9FH4H4F	1.524
		LC1F185, F225, F1854 or F2254	LA9FH4H4G	1.527
LC1F265, F330, F2654 or F3304	LC1F115, F150, F1154 or F1504	LC1F265, F330, F2654 or F3304	LA9FH4H4H	1.684
		LC1F115, F150, F1154 or F1504	LA9FJ4F4F	1.421
		LC1F115, F150, F1154 or F1504	LA9FJ4G4F	1.424
LC1F185, F225, F1854 or F2254	LC1F185, F225, F1854 or F2254	LC1F185, F225, F1854 or F2254	LA9FJ4G4G	1.428
		LC1F115, F150, F1154 or F1504	LA9FJ4H4F	1.595
		LC1F185, F225, F1854 or F2254	LA9FJ4H4G	1.598
LC1F265, F330, F2654 or F3304	LC1F115, F150, F1154 or F1504	LC1F265, F330, F2654 or F3304	LA9FJ4H4H	1.755
		LC1F115, F150, F1154 or F1504	LA9FJ4J4F	1.666
		LC1F185, F225, F1854 or F2254	LA9FJ4J4G	1.669
LC1F400, F4002 or F4004	LC1F185, F225, F1854 or F2254	LC1F265, F330, F2654 or F3304	LA9FJ4J4H	1.829
		LC1-F400, F4002 or F4004	LA9FJ4J4J	1.890
		LC1F115, F150, F1154 or F1504	LA9FK4F4F	1.421
LC1F500, F5002 or F5004	LC1F115, F150, F1154 or F1504	LC1F115, F150, F1154 or F1504	LA9FK4G4F	1.424
		LC1F185, F225, F1854 or F2254	LA9FK4G4G	1.428
		LC1F115, F150, F1154 or F1504	LA9FK4H4F	1.595
LC1F265, F330, F2654 or F3304	LC1F115, F150, F1154 or F1504	LC1F185, F225, F1854 or F2254	LA9FK4H4G	1.598
		LC1F265, F330, F2654 or F3304	LA9FK4H4H	1.755
		LC1F115, F150, F1154 or F1504	LA9FK4J4F	1.666
LC1F400, F4002 or F4004	LC1F185, F225, F1854 or F2254	LC1F265, F330, F2654 or F3304	LA9FK4J4G	1.669
		LC1F265, F330, F2654 or F3304	LA9FK4J4H	1.829
		LC1F400, F4002 or F4004	LA9FK4J4J	1.896
LC1F500, F5002 or F5004	LC1F115, F150, F1154 or F1504	LC1F115, F150, F1154 or F1504	LA9FK4K4F	1.666

(1) To order the 3 contactors, see pages B9/2 and B9/3. For auxiliary contact blocks LADN02 used for electrical locking, see page B9/11. For accessories, see pages B9/12 to B9/14.

(2) Minimum distances between contactors, see page B9/39.

(3) The kit contains the lever arms, the 2 x Ø8 mm rods and all parts required for assembly. 1 right-angled mounting bracket included per driven contactor LC1F265 to 5004.





Example of assembly using LA9FL4J4J kit (2 right-angled mounting brackets included)



LA9FL4G4F

Components for reversing and changeover assemblies of 3 LC1F contactors - 3-pole, 4-pole.

### Mechanical interlock kits (continued)

#### Vertically mounted

Contactor type <sup>(1)</sup>			Mechanical interlock <sup>(2)</sup>	
Top	Middle	Bottom	Kit reference <sup>(3)</sup>	Weight kg
LC1F500, F5002 or F5004 (continued)	LC1F500, F5002 or F5004	LC1F185, F225, F1854 or F2254	LA9FK4K4G	1.669
		LC1F265, F330, F2654 or F3304	LA9FK4K4H	1.825
		LC1F400, F4002 or F4004	LA9FK4K4J	1.896
		LC1-F500, F5002 or F5004	LA9FK4K4K	1.896
LC1F630, F800, F6302 or F6304	LC1F115, F150, F1154 or F1504	LC1F115, F150, F1154 or F1504	LA9FL4F4F	1.428
		LC1F185, F225, F1854 or F2254	LA9FL4G4F	1.431
		LC1F185, F225, F1854 or F2254	LA9FL4G4G	1.436
		LC1F265, F330, F2654 or F3304	LA9FL4H4F	1.602
LC1F400, F4002 or F4004	LC1F115, F150, F1154 or F1504	LC1F185, F225, F1854 or F2254	LA9FL4H4G	1.606
		LC1F265, F330, F2654 or F3304	LA9FL4H4H	1.751
		LC1F400, F4002 or F4004	LA9FL4J4F	1.673
		LC1F185, F225, F1854 or F2254	LA9FL4J4G	1.676
LC1F500, F5002 or F5004	LC1F115, F150, F1154 or F1504	LC1F265, F330, F2654 or F3304	LA9FL4J4H	1.832
		LC1F400, F4002 or F4004	LA9FL4J4J	1.903
		LC1F185, F225, F1854 or F2254	LA9FK4K4F	1.666
		LC1F185, F225, F1854 or F2254	LA9FK4K4G	1.669
LC1F630, F800, F6302 or F6304	LC1F115, F150, F1154 or F1504	LC1F265, F330, F2654 or F3304	LA9FK4K4H	1.825
		LC1F400, F4002 or F4004	LA9FK4K4J	1.896
		LC1-F500, F5002 or F5004	LA9FK4K4K	1.896
		LC1F115, F150, F1154 or F1504	LA9FL4L4F	1.680
LC1F500, F5002 or F5004	LC1F115, F150, F1154 or F1504	LC1F185, F225, F1854 or F2254	LA9FL4L4G	1.683
		LC1F265, F330, F2654 or F3304	LA9FL4L4H	1.910
		LC1F400, F4002 or F4004	LA9FL4L4J	1.896
		LC1F500, F5002 or F5004	LA9FL4L4K	1.896
LC1F630, F800, F6302, or F6304	LC1F115, F150, F1154 or F1504	LC1F630, F800, F6302, or F6304	LA9FL4L4L	1.920

(1) To order the 3 contactors, see pages B9/2 and B9/3. For auxiliary contact blocks LADN02 used for electrical locking, see page B9/11. For accessories, see pages B9/12 to B9/14.

(2) Minimum distances between contactors.

This is the distance, in mm, between the centres of two adjacent contactors (between the top and middle contactors or between the middle and bottom contactors).

Contactor						
Bottom or top	Middle					
	LC1F115 or F150	LC1F185 or F225	LC1F265 or F330	LC1F400	LC1F500	LC1F630 or F800
LC1F115 or F150	200	210	240	250	270	320
LC1F185 or F225	210	220	250	250	270	330
LC1F265 or F330	240	250	250	260	280	350
LC1F400	250	250	260	260	280	320
LC1F500	270	270	280	280	300	340
LC1F630 or F800	320	330	350	320	340	380

(3) The kit contains the lever arms, the 2 x Ø8 mm rods and all parts required for assembly. 1 right-angled mounting bracket included per driven contactor LC1F265 to 8004.



### 3-pole, 4-pole electrical distribution - changeover application

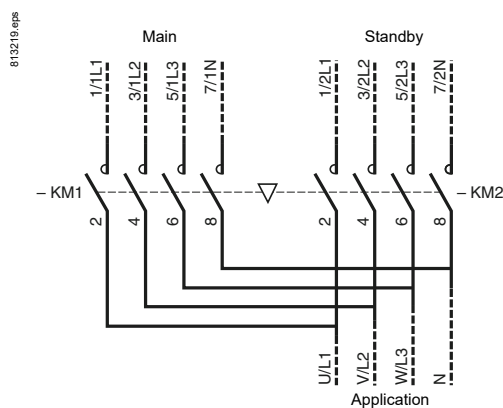
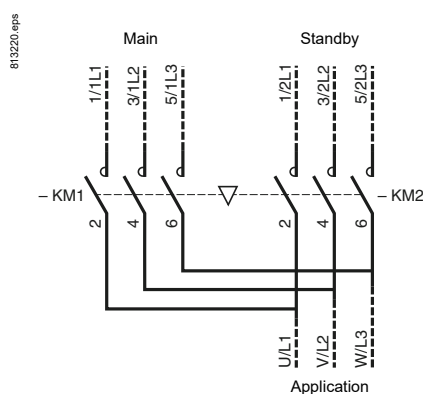
A changeover contactor pair ensures continuity of operation of an installation and energy management.

It switches between:

- a power supply source M (main) which normally supplies the installation
- and a power supply source S (standby) which may be an incoming line from an additional network or a generating set.

The supply sources may be 3-phase or 3-phase + neutral.

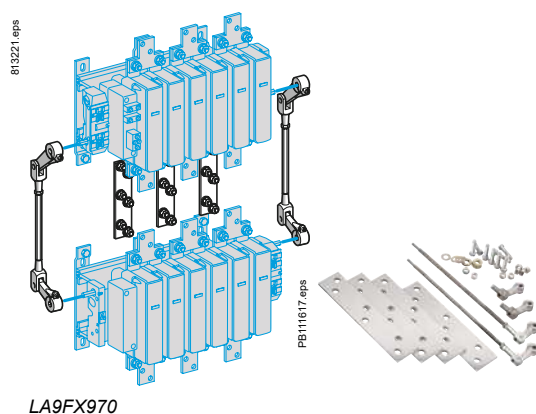
#### Supply - 3-phase



The 2 contactors must be mechanically and electrically interlocked to prevent any paralleling, even transitory, of the two supplies.







### Changeover contactor pairs for customer assembly: 3-phase

Vertically mounted.

Maximum operational voltage: 1000 V.

Utilisation category: AC-1.

Maximum temperature in the vicinity of the devices: 40 °C.

a.c. or d.c. contactor control voltage.

Maximum operational current AC-1		Contactors <sup>(1)</sup>		Mechanical interlock <sup>(2)</sup>
Main 3-phase	Standby 3-phase	Main Reference	Standby Reference	Reference
1600 A	1000 A	LC1F780	LC1F6309	LA9FX970
1600 A	1600 A	LC1F780	LC1F780	LA9FX970

### Changeover contactor pairs for customer assembly: 3-phase + neutral

Vertically mounted.

Maximum operational voltage: 1000 V.

Utilisation category: AC-1.

Maximum temperature in the vicinity of the devices: 40 °C.

a.c. or d.c. contactor control voltage.

Maximum operational current AC-1		Contactors <sup>(1)</sup>		Mechanical interlock <sup>(2)</sup>
Main 3-phase + N	Standby 3-phase + N	Main Reference	Standby Reference	Reference
1600 A + 1000 A	1000 A + 1000 A	LC1F78041	LC1F63049	LA9FX970 <sup>(3)</sup>
1600 A + 1000 A	1600 A + 1000 A	LC1F78041	LC1F78040	LA9FX970 <sup>(3)</sup>
1600 A + 1600 A	1000 A + 1000 A	LC1F7804	LC1F63049	LA9FX971
1600 A + 1600 A	1600 A + 1600 A	LC1F7804	LC1F7804	LA9FX971

<sup>(1)</sup> Coils to be ordered separately, see pages B9/17 to B9/26.

<sup>(2)</sup> Double mechanical interlock mechanism with 2 interlock connecting rods and 4 power connecting links. To order the the 2 auxiliary contact blocks **LADN●1** required to obtain electrical interlocking between the 2 contactors: see page B9/11.

<sup>(3)</sup> Neutral connecting link not supplied (to be ordered separately).



#### Control Panel Technical Guide:

Description and product reference of all mounting kits and wiring accessories for TeSys D, K, F - Star Delta, reverser, low-high speed control motor starters and changeover applications.

> Ref. Document: CPTG011\_EN



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High power  
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B9/42

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# TeSys F

## Technical Data for Designers

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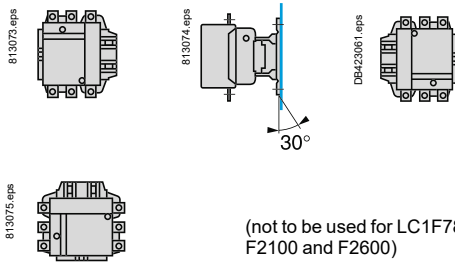
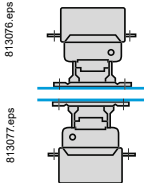
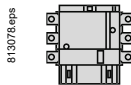
High power  
contactors



# TeSys

## TeSys F High power contactors

### Characteristics

Environment					
Contactor type			LC1F115	LC1F150	LC1F185
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1. Overvoltage category III, degree of pollution: 3	V	1000	1000	1000
Rated impulse withstand voltage (Uimp)	Coil not connected to the power circuit	kV	8	8	8
Conforming to standards			IEC/EN 60947-4-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, JIS C 8201-4-1		
Product certifications			UL, CSA, CCC, CB certification, EAC, ABS, BV, DNV-GL, LRoS, RINA, RMRoS		
Degree of protection	Conforming to IEC 60529		IP 2X front face with shrouds LA9F		
Climatic withstand			According to IACS E10		
Ambient air temperature around the device	Storage	°C	-60...+80		
	Operation	°C	-5...+55		
	Permissible at Uc <sup>(1)</sup>	°C	-40...+70		
Maximum operating altitude	Without derating	m	3000		
Operating positions	Without derating		 <p>(not to be used for LC1F780, F1000, F1400, F1700, F2100 and F2600)</p>		
	With derating		 <p>Apply the following derating coefficients: 0.75 on the pull-in voltage, 0.9 on the drop-out voltage and 0.8 on the operational current in AC-1.</p> <p>Apply the following derating coefficients: 1.15 on the pull-in voltage, 1.1 on the drop-out voltage and 0.8 on the operational current in AC-1.</p> <p>In either case: neither the making and breaking capacities nor the electrical and mechanical durabilities can be assured.</p>		
	Not to be used				
Shock resistance <sup>(2)</sup> 1/2 sine wave = 11 ms	Contactor open		9 gn	9 gn	7 gn
	Contactor closed <sup>(3)</sup>		15 gn	15 gn	15 gn
Vibration resistance <sup>(2)</sup> 5...300 Hz	Contactor open		2 gn	2 gn	2 gn
	Contactor closed		6 gn	6 gn	5 gn

<sup>(1)</sup> In these conditions, it is recommended that LX9F coils be used for contactor sizes F115 to F225.

<sup>(2)</sup> In the least favourable direction, without change of contact state (coil at Uc). Where higher resistance to mechanical shock is required, select shock-proof contactors. Please consult your Regional Sales Office.

<sup>(3)</sup> 12 gn for F115-F1250 contactors when used with Electronic control module (LA4EM) & LXE coils.

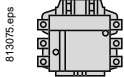
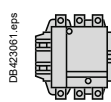
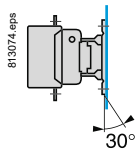
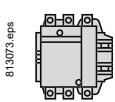


# TeSys

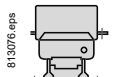
## TeSys F High power contactors

### Characteristics

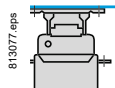
LC1F225	LC1F265	LC1F330	LC1F400	LC1F500	LC1F630	LC1F780	LC1F800	LC1 F1000	LC1 SF1200	LC1 F1250	LC1 F1400	LC1 F1700	LC1 F2100	LC1 F2600
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
EN 60947-1, EN 60947-4-1, IEC 60947-1, IEC 60947-4-1, JIS C 8201-4-1 (except for LC1F1000 & LC1SF1200)														
UL, CSA , CCC, CB certification, EAC, ABS, BV, DNV-GL, LRoS, RINA, RMRoS							CB, CSA, UL, CCC, LROS, ABS, RMROS	CB, CSA, CCC	CB, CCC	CB, CSA, CCC, UL				
IP 20 front face with shrouds LA9F								—	—	—				
According to IACS E10														
-60...+80														
-5...+55								-5...+40	-5...+60	-5...+40				
-40...+70							-5...+55	-40...+60	-40...+70	-40...+60				
3000														



(not to be used for LC1F780, F1000, F1400, F1700, F2100 and F2600)



Apply the following derating coefficients: 0.75 on the pull-in voltage, 0.9 on the drop-out voltage and 0.8 on the operational current in AC-1.



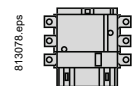
Apply the following derating coefficients: 1.15 on the pull-in voltage, 1.1 on the drop-out voltage and 0.8 on the operational current in AC-1.

In either case: neither the making and breaking capacities nor the electrical and mechanical durabilities can be assured.

Not to be used

Possible positions with derating (see corresponding paragraph on left, same line)

Not to be used



7 gn	6 gn	6 gn	6 gn	9 gn	6 gn	5 gn	6 gn	6 gn	6 gn	6 gn	6 gn	6 gn	6 gn	6 gn
15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn	15 gn
2 gn	2 gn	2 gn	1.5 gn	2 gn	2 gn	2.5 gn	2 gn	2 gn	2 gn	2 gn	2 gn	2 gn	2 gn	2 gn
5 gn	5 gn	5 gn	5 gn	4 gn	4 gn	5.5 gn	4 gn	4 gn	4 gn	4 gn <sup>(1)</sup>	4 gn	4 gn	4 gn	4 gn

(1) Vibration resistance 5...30 Hz, when used with Electronic Control Module (ECM).



# TeSys

## TeSys F High power contactors

### Characteristics

Pole characteristics								
Contactor type			LC1F115	LC1F150	LC1F185	LC1F225	LC1F265	
Number of poles			3 or 4	3 or 4	3 or 4	3 or 4	3 or 4	
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-3, θ ≤ 55 °C	A	115	150	185	225	265	
	In AC-1, θ ≤ 40 °C	A	200	250	275	315	350	
Rated operational voltage (Ue)	Up to	V	690	690	690	690	1000 <sup>(5)</sup>	
Frequency limits	Of the operational current <sup>(1)</sup>	Hz	16 <sup>2/3</sup> ...200	16 <sup>2/3</sup> ...200	16 <sup>2/3</sup> ...200	16 <sup>2/3</sup> ...200	16 <sup>2/3</sup> ...200	
Conventional thermal current	θ ≤ 40 °C	A	200	250	275	315	350	
Rated making capacity	I rms conforming to IEC 60947-4-1	A	Making current: 10 x I in AC-3 or 12 x I in AC-4					
Rated breaking capacity	I rms conforming to IEC 60947-4-1	A	Making and breaking current: 8 x I in AC-3 or 10 x I in AC-4					
Maximum permissible current No current flowing for previous 60 minutes, at θ ≤ 40 °C	For 10 s	A	1100	1200	1500	1800	2200	
	For 30 s	A	640	700	920	1000	1230	
	For 1 min	A	520	600	740	850	950	
	For 3 min	A	400	450	500	560	620	
	For 10 min	A	320	350	400	440	480	
Short-circuit protection by fuses U ≤ 440 V	Motor circuit (type aM)	A	125	160	200	250	315	
	With thermal overload relay (type gG)	A	200	200	315	315	500	
	gG fuses	A	200	250	315	315	400	
Average impedance per pole	At Ith and 50 Hz	mΩ	0.37	0.35	0.33	0.32	0.3	
Power dissipation per pole for the above operational currents	AC-3	W	5	8	12	16	21	
	AC-1	W	15	22	25	32	37	
Connection			Maximum c.s.a.					
Bar	Number of bars		2	2	2	2	2	
	Bar	mm	20 x 3	25 x 3	25 x 3	32 x 4	32 x 4	
	Cable with lug	mm²	95	120	150	185	240	
	Cable with connector	mm²	95	120	150	185	240	
	Bolt diameter	mm	Ø6	Ø8	Ø8	Ø10	Ø10	
Tightening torque		Power circuit connections	N.m	10	18	18	35	35

(1) Sine wave without interference. Above these values, contactors can be used only for AC-1 application.

(2) With set of right-angled connectors **LA9F2100** (see page B9/13).

(3) Paralleling of poles must be carried out only in accordance with the fuse manufacturer's recommendations.

(4) θ ≤ 60 °C with set of right-angled connectors **LA9F2600** (see page B9/13).

(5) Ue ≤ 690 V in AC-3; Ue ≤ 1000 V in AC-1.

(6) Ue = 1000 V, with set of right angled connectors **LA9F2100** (see page B9/13).



# TeSys

## TeSys F High power contactors

### Characteristics

LC1F330	LC1F400	LC1F500	LC1F630	LC1F780	LC1F800	LC1F1000	LC1SF1200	LC1F1250	LC1F1400	LC1F1700	LC1F2100	LC1F2600
3 or 4	2, 3 or 4	2, 3 or 4	2, 3 or 4	3 or 4	3	3	3	3	3	3	3	3
330	400	500	630	780	800	1000	-	-	-	-	-	-
400	500	700	1000	1600	1000	1250	1200	1260	1400	1700	2100 <sup>(2)</sup>	2600 <sup>(4)</sup>
1000	1000	1000 <sup>(5)</sup>	1000	1000	1000	440	690	690	1000	1000	1000 <sup>(6)</sup>	1000
16 <sup>2/3</sup> ...200	16 <sup>2/3</sup> ...200	16 <sup>2/3</sup> ...200	16 <sup>2/3</sup> ...200	16 <sup>2/3</sup> ...200	16 <sup>2/3</sup> ...200	16 <sup>2/3</sup> ...200	16 <sup>2/3</sup> ...200	16 <sup>2/3</sup> ...200	16 <sup>2/3</sup> ...200	16 <sup>2/3</sup> ...200	16 <sup>2/3</sup> ...200	16 <sup>2/3</sup> ...200
400	500	700	1000	1600	1000	1250	1200	1260	1400	1700	2100 <sup>(2)</sup>	2600 <sup>(4)</sup>
Making current: 10 x I in AC-3 or 12 x I in AC-4						10 x I in AC-3	Making current: 1.5 x I in AC-1					
Making and breaking current: 8 x I in AC-3 or 10 x I in AC-4						8 x I in AC-3	Making and breaking current: 1.5 x I in AC-1					
2650	3600	4200	5050	6250	5500	10000	8000	8000	8000	10000	10000	12000
1800	2400	3200	4400	5600	4600	7500	5200	5200	6000	7500	7500	9000
1300	1700	2400	3400	4600	3600	5500	4000	4000	4500	5500	5500	7000
900	1200	1500	2200	3000	2600	4200	3000	3000	4000	4200	4200	6000
750	1000	1200	1600	2200	1700	3000	2000	2000	2600	3000	3000	4000
400	400	500	630	800	800	1000	-	-	-	-	-	-
500	630	800	800	1000	1000	1000	-	-	-	-	-	-
500	500	800	1000	2 x 800 <sup>(3)</sup>	1000	1000	1400	1400	2 x 800 <sup>(3)</sup>	2 x 800 <sup>(3)</sup>	2 x 1000 <sup>(3)</sup>	2 x 1250 <sup>(3)</sup>
0.28	0.26	0.18	0.12	0.10	0.12	0.12	0.10	0.12	0.10	0.10	0.10	0.10
31	42	45	48	60	77	100	-	-	-	-	-	-
44	65	88	120	250	120	120	120	120	150	200	200	250
Maximum c.s.a.												
2	2	2	2	2	2	3	2	2	2	3	4	3
30 x 5	30 x 5	40 x 5	60 x 5	100 x 5	60 x 5	100 x 5	50x8	100 x 5	100 x 5	100 x 5	100 x 5	100 x 10
240	2 x 150	2 x 240	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
Ø10	Ø10	Ø10	Ø12	2 x Ø12	Ø12	4 x Ø12 (Ø11.5 with set of right-angled connectors LA9F2100)	3 x Ø12	3 x Ø12 (Ø11.5 with set of right-angled connectors LA9F1250)	4 x Ø12 (Ø11.5 with set of right-angled connectors LA9F2100)			4 x Ø12 (Ø11.5 with set of right-angled connectors LA9F2600)
35	35	35	58	58	58	58 (35 with set of right-angled connectors LA9F2100)	58	58 (35 with set of right-angled connectors LA9F1250)	58 (35 with set of right-angled connectors LA9F2100)			58 (35 with set of right-angled connectors LA9F2600)



# TeSys

## TeSys F High power contactors

### Characteristics

a.c. control circuit characteristics with LX9 coil								
Contactor type				LC1F115	LC1F150	LC1F185	LC1F225	LC1F265
Rated control circuit voltage (Uc)			V	48...500				24...1000
Control voltage limits (θ ≤ 55 °C)	40...400 Hz coils	Operation		0.85...1.1 Uc				0.85...1.1 Uc
		Drop-out		0.2...0.55 Uc				0.35...0.55 Uc
Average consumption at 20 °C and at Uc	Inrush	40...400 Hz coil	VA	690...855	690...855	950...1180	950...1180	600...700
		Cos φ		0.9	0.9	0.9	0.9	0.9
	Sealed	40...400 Hz coil	VA	6.6...8.1	6.6...8.1	8.9...10.9	8.9...10.9	8...10
		Cos φ		0.9	0.9	0.9	0.9	0.9
Heat dissipation			W	5.9...7.2	5.9...7.2	8...9.8	8...9.8	8
Operating time <sup>(2)</sup>	Closing "C"		ms	35	35	35	35	40...65
	Opening "O"		ms	130	130	130	130	100...170
Mechanical durability at Uc	In millions of operating cycles			10	10	10	10	10
Maximum operating rate at ambient temperature ≤ 55 °C	In operating cycles per hour			2400	2400	2400	2400	2400
Connection				Min/max c.s.a.				
COORD.	Flexible cable without cable end	1 or 2 conductors	mm²	1/4	1/4	1/4	1/4	1/4
		2 conductors	mm²	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5
	Flexible cable with cable end	1 conductor	mm²	1/4	1/4	1/4	1/4	1/4
		2 conductors	mm²	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5
Ref.	Solid cable without cable end		mm²	1/4	1/4	1/4	1/4	1/4
			mm²	1/4	1/4	1/4	1/4	1/4
Tightening torque			N.m	1.2	1.2	1.2	1.2	1.2
Mechanical latching			Mechanical latch blocks LA6DK must not be fitted on LC1F contactors. For similar type of operation, use magnetic latching contactors CR1F. See pages B9/28 to B9/33.					

(1) Equipped with 2 coils.

(2) The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.



# TeSys

## TeSys F High power contactors

### Characteristics

LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F780 <sup>(1)</sup>	LC1 F800	LC1 F1000 <sup>(1)</sup>	LC1 F1250	LC1 F1400 <sup>(1)</sup>	LC1 F1700	LC1 F2100 <sup>(1)</sup>	LC1 F2600 <sup>(1)</sup>
24...1000	48...1000		48...1000	110...500	110...400	110...500	110...600	110...500	110...500	110...500	110...500
0.85...1.1 Uc	0.85...1.1 Uc		0.85...1.1 Uc	0.85...1.1 Uc	0.85...1.1 Uc	0.85...1.1 Uc	0.85...1.1 Uc	0.85...1.1 Uc	0.85...1.1 Uc	0.85...1.1 Uc	0.85...1.1 Uc
0.35...0.55 Uc	0.3...0.5 Uc		0.25...0.5 Uc	0.2...0.4 Uc	0.3...0.5 Uc	0.3...0.5 Uc	0.25...0.5 Uc	0.3...0.5 Uc	0.3...0.5 Uc	0.3...0.5 Uc	0.3...0.5 Uc
600...700	1000...1150	1050...1150	1500...1730	1900...2300	1700	1600...2400	1500...1730	1600...2400	1600...2400	1600...2400	2200...2700
0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
8...10	12...18	16...20	20...25	44...55	12	29...37	20...25	29...37	29...37	29...37	37.4...50.6
0.9	0.9	0.9	0.9	0.9	–	0.9	0.9	0.9	0.9	0.9	0.9
8	14	18	20	2 x 22	25	2 x 18	20	2 x 18	2 x 18	2 x 18	2 x 25
40...65	40...75	40...75	40...80	40...80	60...80	40...75	40...80	40...75	40...75	40...75	40...80
100...170	100...170	100...170	100...200	130...230	160...180	100...170	100...200	100...170	100...170	100...170	100...200
10	10	10	5	5	5	0.5	1	0.5	0.5	0.5	0.5
2400	2400	2400	1200	600	600	600	1200	600	600	600	600
Min/max c.s.a.											
1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5
1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

Mechanical latch blocks LA6DK must not be fitted on LC1F contactors.  
For similar type of operation, use magnetic latching contactors CR1F.  
See pages B9/28 to B9/33.



# TeSys

## TeSys F High power contactors

### Characteristics

d.c. control circuit characteristics with LX4 coil							
Contactor type			LC1F115	LC1F150	LC1F185	LC1F225	LC1F265
Rated control circuit voltage (Uc) ---		V	24...460	24...460	24...460	24...460	24...460
Control voltage limits (θ ≤ 55 °C)	Operation		0.85...1.1 Uc	0.85...1.1 Uc	0.85...1.1 Uc	0.85...1.1 Uc	0.85...1.1 Uc
	Drop-out		0.15...0.2 Uc	0.15...0.2 Uc	0.15...0.2 Uc	0.15...0.2 Uc	0.15...0.2 Uc
Average consumption at 20 °C and at Uc	--- Inrush	W	543...665	543...665	737...902	737...902	655...803
	Sealed	W	3.94...4.83	3.94...4.83	4.13...5.07	4.13...5.07	3.68...4.53
Average operating time at Uc <sup>(1)</sup>	Closing "C"	ms	30...40	30...40	30...40	30...40	40...50
	Opening "O"	ms	30...50	30...50	30...50	30...50	40...65
<i>Note: the arcing time depends on the circuit switched by the poles. For all normal 3-phase applications, the arcing time is less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.</i>							
Mechanical durability at Uc	In millions of operating cycles		10	10	10	10	10
Maximum operating rate at ambient temperature ≤ 55 °C	In operating cycles per hour		2400	2400	2400	2400	2400
Cabling			Min/max c.s.a.				
Flexible cable without cable end	1 conductor	mm <sup>2</sup>	1/4	1/4	1/4	1/4	1/4
	2 conductors	mm <sup>2</sup>	1/4	1/4	1/4	1/4	1/4
Flexible cable with cable end	1 conductor	mm <sup>2</sup>	1/4	1/4	1/4	1/4	1/4
	2 conductors	mm <sup>2</sup>	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5
Solid cable without cable end	1 conductor	mm <sup>2</sup>	1/4	1/4	1/4	1/4	1/4
	2 conductors	mm <sup>2</sup>	1/4	1/4	1/4	1/4	1/4
Tightening torque		N.m	1.2	1.2	1.2	1.2	1.2
Mechanical latching		Mechanical latch blocks LA6DK must not be fitted on LC1F contactors. For similar type of operation, use magnetic latching contactors CR1F. See pages B9/28 to B9/33.					

(1) The operating times depend on the type of contactor electromagnet and its control mode.  
The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

COORD.

Ref.



High power  
contactors



# TeSys

## TeSys F High power contactors

### Characteristics

LC1F330	LC1F400	LC1F500 / LC1SF1200 <sup>(1)</sup>	LC1F630	LC1F780	LC1F800	LC1F1000	LC1F1250	LC1F1400	LC1F1700	LC1F2100	LC1F2600
24...460	48...440	48...440	48...440	110...440	110...400	110...440	48...250	110...440	110...440	110...440	110...440
0.85...1.1 U <sub>c</sub>	0.85...1.1 U <sub>c</sub>	0.85...1.1 U <sub>c</sub>	0.85...1.1 U <sub>c</sub>	0.85...1.1 U <sub>c</sub>	0.85...1.1 U <sub>c</sub>	0.85...1.1 U <sub>c</sub>	0.85...1.1 U <sub>c</sub>	0.85...1.1 U <sub>c</sub>	0.85...1.1 U <sub>c</sub>	0.85...1.1 U <sub>c</sub>	0.85...1.1 U <sub>c</sub>
0.15...0.2 U <sub>c</sub>	0.2...0.35 U <sub>c</sub>	0.2...0.35 U <sub>c</sub> <sup>(2)</sup>	0.2...0.35 U <sub>c</sub>	0.2...0.4 U <sub>c</sub>	0.3...0.5 U <sub>c</sub>	0.2...0.35 U <sub>c</sub>	0.2...0.35 U <sub>c</sub>	0.2...0.35 U <sub>c</sub>	0.2...0.35 U <sub>c</sub>	0.2...0.35 U <sub>c</sub>	0.2...0.35 U <sub>c</sub>
655...803	920...1140	990...1220	1420...1920	1960...2420	1900	2000...2200	1420...1920	2000...2200	2000...2200	2000...2200	2130...2880
3.68...4.53	4...7.5	4.54...8	6.5...12.5	42...52	12	8...10	6.5...12.5	8...10	8...10	8...10	13...25
40...50	50...60	50...60	60...70	70...80	60...80	50...60	60...70	50...60	50...60	50...60	60...70
40...65	45...60	45...60	40...50	100...130	40...50	45...60	40...50	45...60	45...60	45...60	40...50

**Note:** the arcing time depends on the circuit switched by the poles. For all normal 3-phase applications. the arcing time is less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.

10	10	10/0.5	5	5	5	0.5	1	0.5	0.5	0.5	0.5
2400	2400	2400/1200	1200	600	600	600	1200	600	600	600	600
Min/max c.s.a.											
1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5
1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/4
1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

Mechanical latch blocks LA6DK must not be fitted on LC1F contactors.  
For similar type of operation, use magnetic latching contactors CR1F.  
See pages B9/28 to B9/33.

**(1)** LC1SF1200BD, LC1SF1200FD, LC1SF1200MD ranges are available.

**(2)** Drop-out limits for LC1SF1200BD shall be 0.2...0.4 U<sub>c</sub>.



# TeSys

## TeSys F High power contactors

### Characteristics

#### a.c. or d.c. control circuit characteristics with LXE coil <sup>(1)</sup>

Contactor type				LC1F115, F150	LC1F185, F225	LC1F265, F330
ECM <sup>(2)</sup> reference				LA4EM250FF	LA4EM250FG	LA4EM250FH
Coil reference				LXEFF250	LXEFG250	LXEFH250
Rated control circuit voltage (Uc)	50/60 Hz		V	100...250		
	---		V	100...380		
Control voltage limits (< 55 °C) 50/60 Hz	Operation		V	85...275		
	Drop-out		V	< 60		
---	Operation		V	85...418		
	Drop-out		V	< 45		
Average consumption at 20 °C and at Uc	Inrush	50/60 Hz	VA rms	280...310	280...310	300...350
		Cos φ		0.5...0.6		
		---	W	270...320	270...320	300...310
	Sealed	50/60 Hz	VA	4.5...7.0	4.5...7.0	4.5...7.0
		Cos φ		0.5...0.6		
		---		2.5...4.0	2.5...4.0	2.5...4.0
Embedded PLC <sup>(4)</sup> input according IEC 61131-2 type 2	Off state		V DC	0...5		
	On state			11...30		
Heat dissipation			W	2.2...5.5		
Operating time	Closing “C”		ms	40...80		
	Opening “O”		ms	6...54		
Mechanical durability at Uc	In millions of operating cycles			10		
Maximum operating rate at ambient temperature ≤ 55 °C	In operating cycles per hour			2400		
Connection <sup>(5)</sup>	Flexible cable without cable end	1 conductor		0.2/2.5		
	Flexible cable with cable end	1 conductor		0.25/2.5		
	Solid cable without cable end	1 conductor		0.2/2.5		
Tightening torque			N.m	0.6		

(1) LXE coil shall be always used along with Electronic Control Module (ECM) **LA4EM250●●**.

(2) Electronic Control Module enables wider coil operating voltage for the TeSys F range of contactors. ECM **LA4EM250●●** shall be always used along with suitable type of **LXE●●250** coils.

(3) **LC1SF1200KUE** is supplied with **LA4EM250FK** & **LXEFK250**.

(4) PLC control connectors shall be provided by customer (Type MC 1.5/2-ST-3.81).

(5) Connection input is made to Electronic control module (ECM).



# TeSys

## TeSys F High power contactors

### Characteristics

LC1F400	LC1SF1200 <sup>(3)</sup>	LC1F1250	LC1F800
LA4EM250FJ	LA4EM250FK	LA4EM250FL	LA4EM250FW
LXEFJ250	LXEFK250	LXEFL250	LXEFW250
100...250			
100...380			–
85...275			
< 60			
85...418			
< 45			
360...470	360...550	460...730	460...730
0.5...0.6			
410...450	410...500	500...680	–
4.5...7.0	5.0...8.0	7...10	7...10
0.5...0.6			
2.5...4.0	2.7...5.0	4.0...5.5	–
0...5			
11...30			
2.2...5.5			
40...80			
6...54			
10	10/0.5	5/1	5
2400	2400/1200	1200	600
0.2/2.5			
0.25/2.5			
0.2/2.5			
0.6			

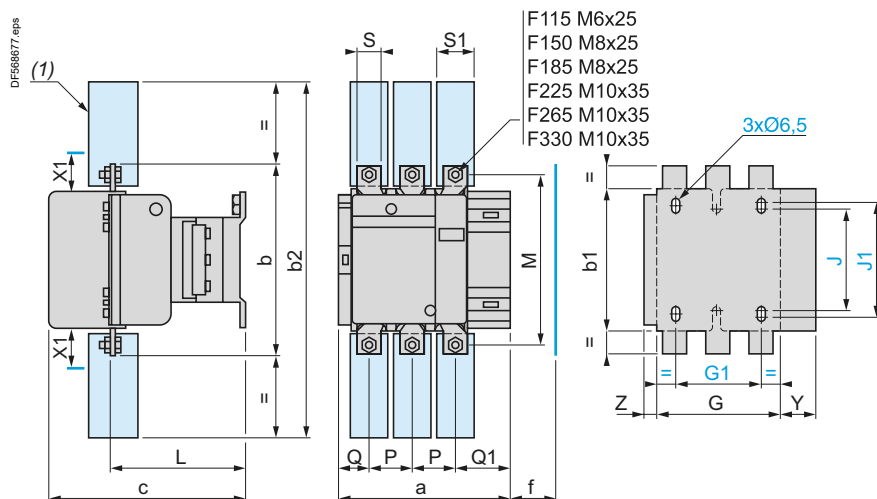


# TeSys

## TeSys F High power contactors

### Dimensions

#### LC1F115 to F330



X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

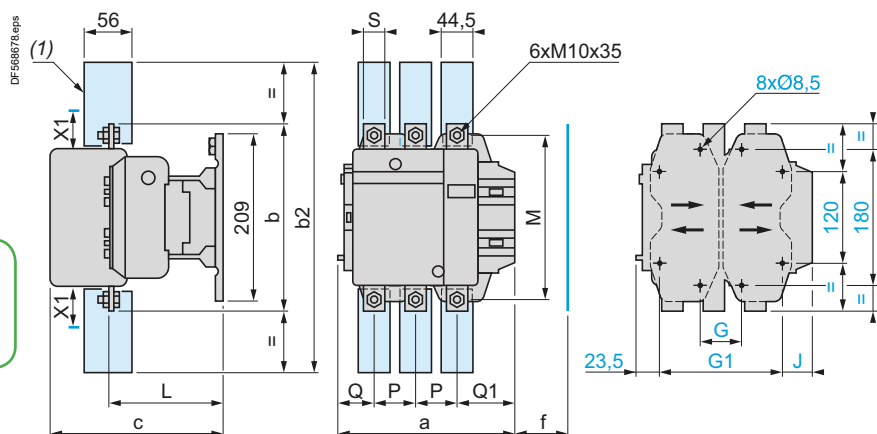
LC1	200...500 V	600...1000 V
F115, F150	10	15
F185	10	15
F225, F265	10	15
F330	10	15

(1) Power terminal protection shroud (see page B9/14).

LC1		a	b	b1	b2	c	f	G	G1	J	J1	L	M	P	Q	Q1	S	S1	Y	Z
F115	3P	163.5	162	137	265	171	131	106	80	106	120	107	147	37	29.5	60	20	26	44	13.5
	4P	200.5	162	137	265	171	131	143	80	106	120	107	147	37	29.5	60	20	26	44	13.5
F150	3P	163.5	170	137	301	171	131	106	80	106	120	107	150	40	26	57.5	20	34	44	13.5
	4P	200.5	170	137	301	171	131	143	80	106	120	107	150	40	26	55.5	20	34	44	13.5
F185	3P	168.5	174	137	305	181	130	111	80	106	120	113.5	154	40	29	59.5	20	34	44	13.5
	4P	208.5	174	137	305	181	130	151	80	106	120	113.5	154	40	29	59.5	20	34	44	13.5
F225	3P	168.5	197	137	364	181	130	111	80	106	120	113.5	172	48	21	51.5	25	44.5	44	13.5
	4P	208.5	197	137	364	181	130	151	80	106	120	113.5	172	48	17	47.5	25	44.5	44	13.5
F265	3P	201.5	203	145	375	213	147	142	96	106	120	141	178	48	39	66.5	25	44.5	38	21.5
	4P	244.5	203	145	375	213	147	190	96	106	120	141	178	48	34	66.5	25	44.5	38	16.5
F330	3P	213	206	145	375	219	147	154.5	96	106	120	145	181	48	43	74	25	44.5	38	20.5
	4P	261	206	145	375	219	147	202.5	96	106	120	145	181	48	43	74	25	44.5	38	20.5

f = minimum distance required for coil removal.

#### LC1F400 and F500



X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

LC1	200...500 V	600...1000 V
F400	15	20
F500	15	20

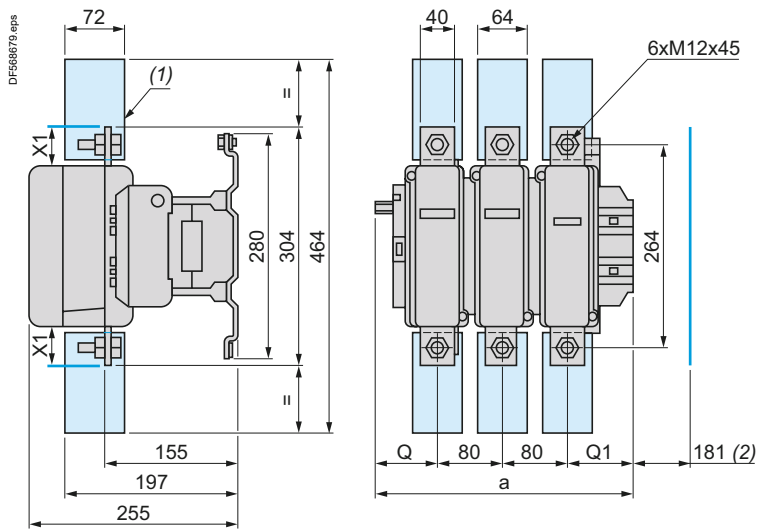
(1) Power terminal protection shroud (see page B9/14).

LC1		a	b	b2	c	f	G supplied	G min.	G max.	G1 supplied	G1 min	G1 max.	J	L	M	P	Q	Q1	S
F400	2P	213	206	375	219	146	80	66	102	170	156	192	19.5	145	181	48	69	96	25
	3P	213	206	375	219	146	80	66	102	170	156	192	19.5	145	181	48	43	74	25
	4P	261	206	375	219	146	80	66	150	170	156	240	67.5	145	181	48	43	74	25
F500	2P	233	238	400	232	150	80	66	120	170	156	210	39.5	146	208	55	76	102	30
	3P	233	238	400	232	150	80	66	120	170	156	210	39.5	146	208	55	46	77	30
	4P	288	238	400	232	150	140	66	175	230	156	265	34.5	146	208	55	46	77	30

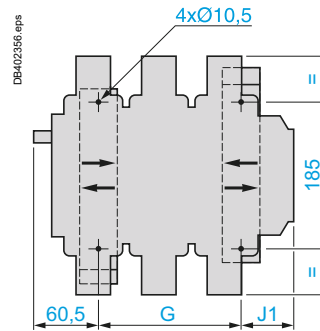
f = minimum distance required for coil removal.



## LC1F630 and F800



LC1		a	G supplied	G min.	G max.	J1	Q	Q1
F630	2P	309	180	100	195	68.5	102	127
F630, F800	3P	309	180	100	195	68.5	60	89
F630	4P	389	240	150	275	88.5	60	89

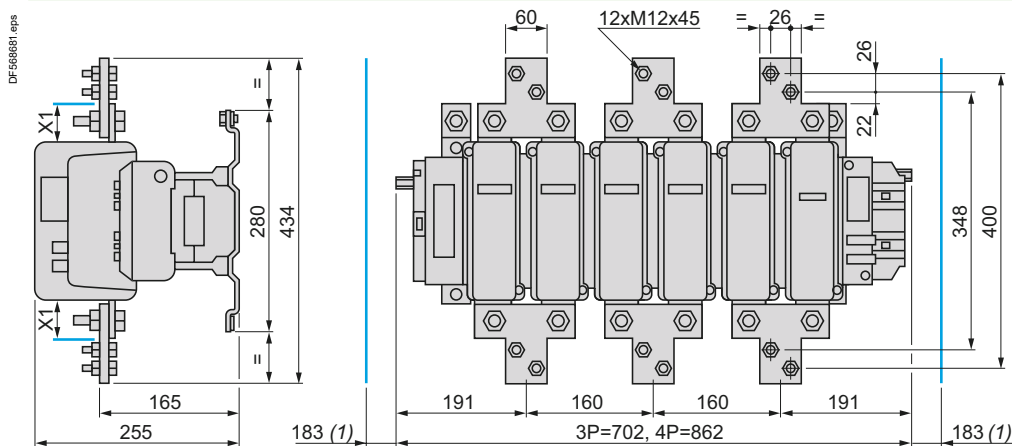


X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

Voltage	200...500 V	690...1000 V	200...690 V	1000 V
LC1F630	20	30	–	–
LC1F800	–	–	10	20

(1) Power terminal protection shroud (see page B9/14).  
(2) Minimum distance required for coil removal.

## LC1F780

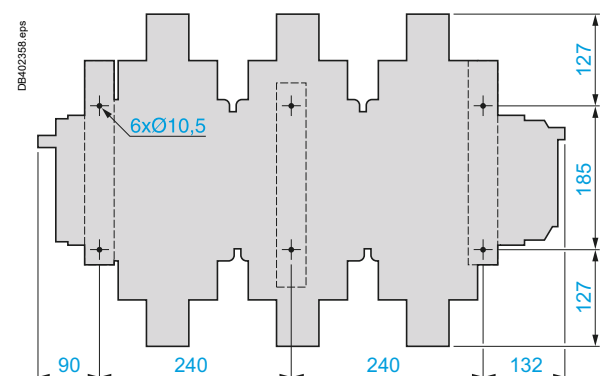
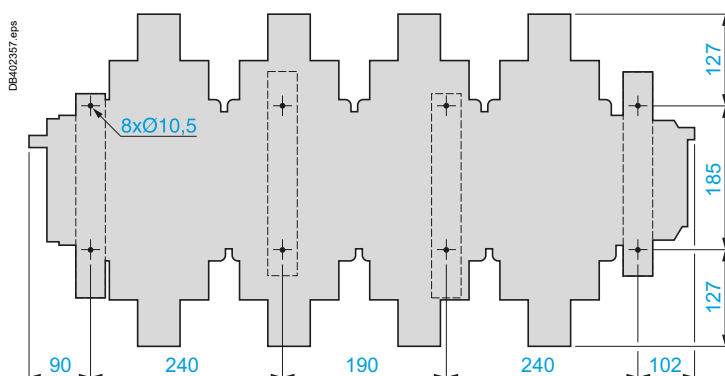


X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

	200...500 V	690...1000 V
X1 (mm)	30	35

(1) *Minimum distance required for coil removal.*

### Fixing centres of LC1F7804



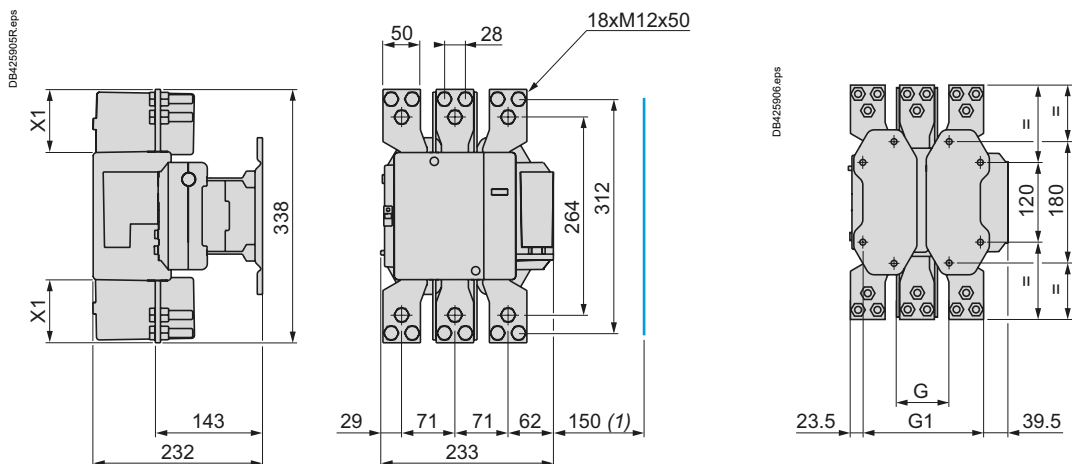


# TeSys

## TeSys F High power contactors

### Dimensions

#### LC1SF1200



(1) Minimum distance required for coil removal.

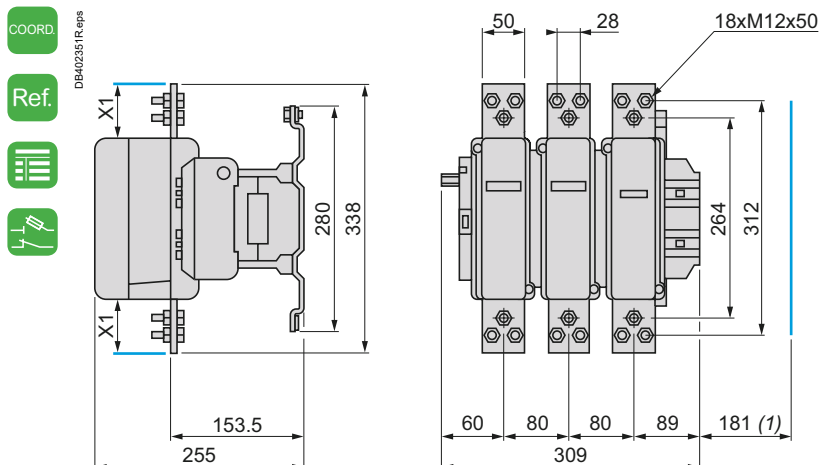
X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

Voltage	200...500 V	≤ 690 V
X1 (mm)	20	30

G <sup>(2)</sup>	Gmin	Gmax	G1 <sup>(2)</sup>	Gmin	Gmax
80	66	120	170	156	210

(2) Factory setting.

#### LC1F1250

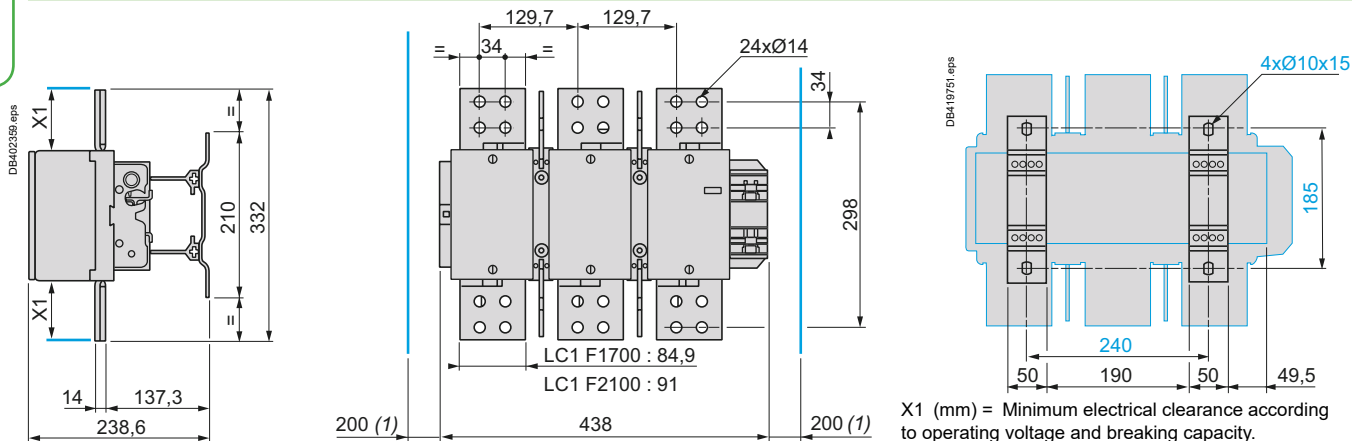


(1) Minimum distance required for coil removal.

X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

Voltage	200...500 V	690...1000 V
X1 (mm)	20	30

#### LC1F1000, LC1F1400, LC1F1700 and LC1F2100



(1) Minimum distance required for coil removal.

X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

Voltage	200...500 V	690...1000 V
X1 (mm)	90	100

Coordination tables:  
pages A6/36 to A6/45

References:  
pages B9/2 to B9/9

Characteristics:  
pages B9/44 to B9/51

Schemes:  
page B9/62

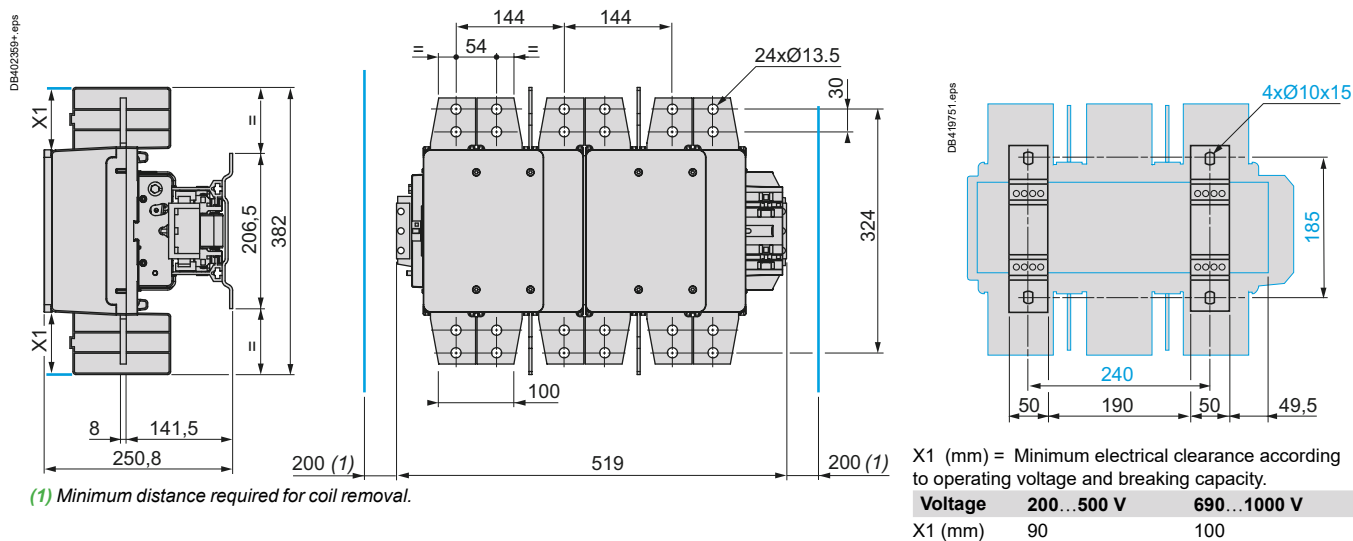


# TeSys

## TeSys F High power contactors

### Dimensions

#### LC1F2600



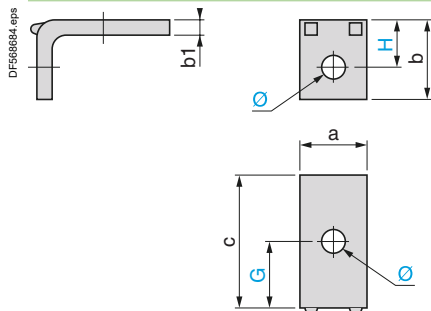


# TeSys

## TeSys F High power contactors - Accessories

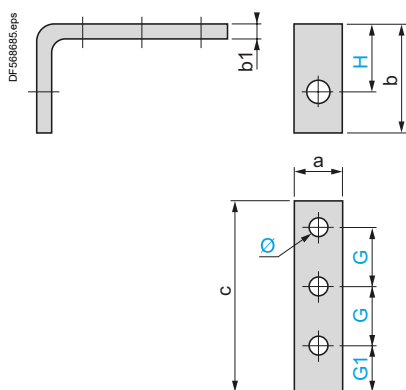
### Dimensions

#### Right-angled connectors LA9F●981 (set of 3) for rear connection



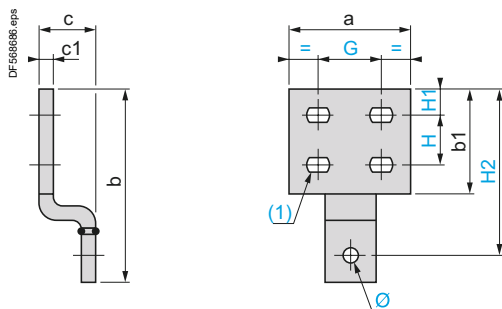
LA9	FF981	FG981	FJ981	FK981	FL981
a	15	20	25	30	40
b	18	23	29	35	48
b1	3	3	4	5	8
c	42	45	55	52	86
G	24	26	32.5	26	45
H	10.5	13	16.5	20	28
Ø	6.5	9	11	11	13

#### Right-angled connectors LA9F●979 (set of 3) for side connection



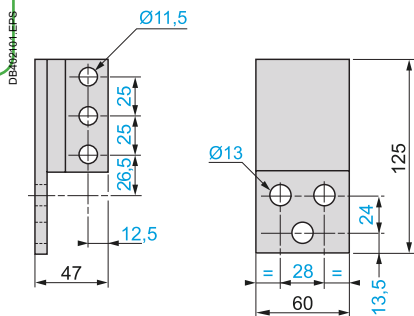
LA9	FF979	FG979	FJ979	FK979	FL979
a	15	20	25	30	40
b	54	58	63.5	68	117
b1	5	5	6	6	10
c	80	92	120	120	130
G	24	28	37	37	37.5
G1	20	22	29	29	35
H	36	39	41	42	76
Ø	6.5	9	11	11	13

#### Right-angled connectors LA9F●980 with large surface area (set of 3)

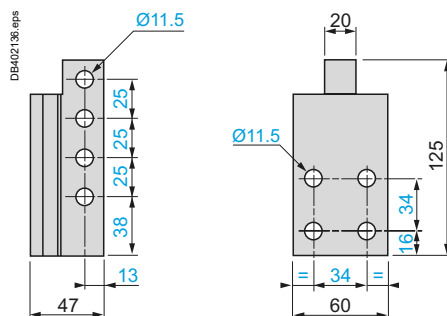


LA9	FF980	FG980	FJ980	FK980	FL980
a	35	40	50	60	100
b	70.5	82.5	98.5	114	154
b1	40	45	55	65	85
c	29	29	33	33	43
c1	3	3	5	5	10
G	18	20	25	29	53
H	18	20	22	26	40
H1	10	12	14	17	20
H2	60.5	72.5	84.5	97	132
Ø	6.5	9	11	11	13
(1)	Ø7 x 10	Ø9 x 12	Ø11 x 14	Ø12.5 x 15	Ø12.5 x 15

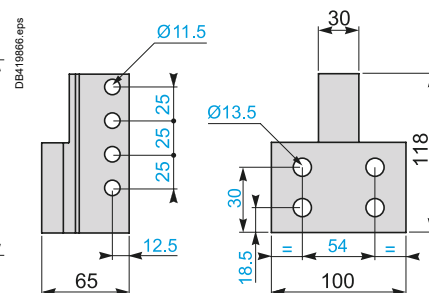
#### Right-angled connectors LA9F1250 (set of 6)



#### Right-angled connectors LA9F2100 (set of 6) for rear connection



#### Right-angled connectors LA9F2600 (set of 6) for rear connection





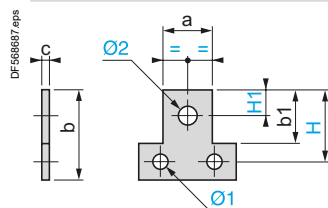
# TeSys

## TeSys F High power contactors - Accessories

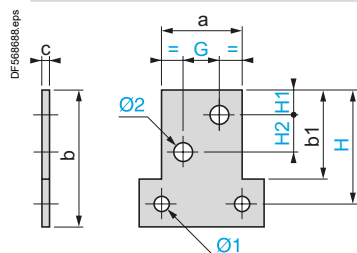
### Dimensions

#### Paralleling links (set of 4)

LA9FF602, FG602, FH602



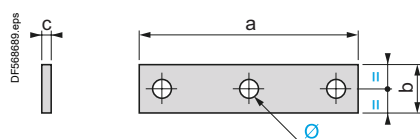
LA9FK602, FL602



LA9	FF602	FG602	FH602	FK602	FL602
a	25	30	40	50	60
b	45	55	60	85	100
b1	30	35	40	55	65
c	4	5	8	10	10
G	—	—	—	22	26
H	37.5	45	52.5	70	85
H1	12.5	15	15	14	17
H2	—	—	—	22	26
Ø1	6.5	9	11	11	13
Ø2	11	11	13	11	14

#### Links for "star" connection of 3 poles

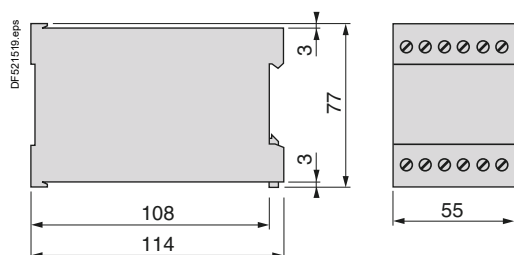
LA9F●601



LA9	FF601	FG601	FH601	FK601	FL601
a	69	100	121	140	200
b	15	20	20	30	40
c	3	3	5	5	8
Ø	6.5 x 8.5	8.5 x 10.5	10.5 x 13	11	13

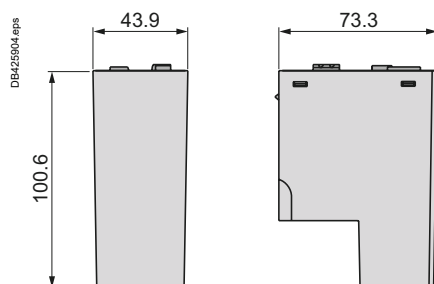
#### Capacitive delayed opening devices for TeSys F contactors

LAZR9●●



#### Electronic Control Module for LXE●●250 coils

LA4EM250●●





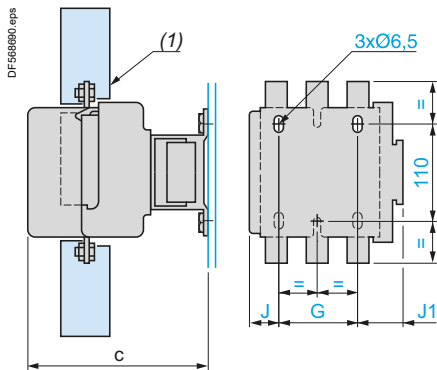
# TeSys

## TeSys F High power contactors

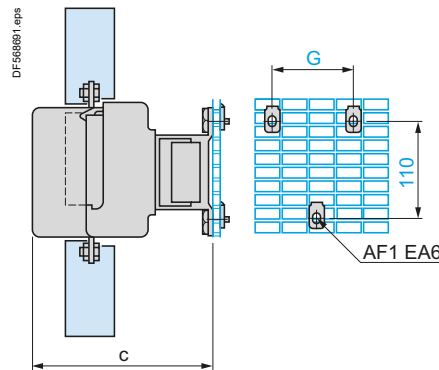
### Mounting

#### LC1F115 to F330

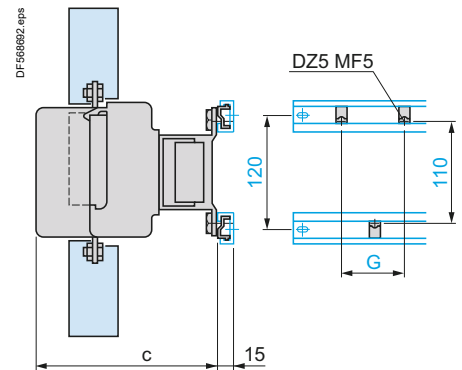
On panel



On pre-slotted mounting plate AM1PA, PB, PC



On rails DZ5MB on 120 mm centres



LC1	F115 F150	F185 F225	F265	F330
c <sup>(2)</sup>	3P 171	181	213	219
	4P 171	181	213	219
G	3P 80	80	96	96
	4P 80	80	96	96
J	3P 26.5	29	44.5	44.5
	4P 45	49	68.5	68.5
J1	3P 57	59.5	61.5	61.5
	4P 75.5	79.5	85.5	85.5

LC1	F115 F150	F185 F225	F265	F330
c <sup>(2)</sup>	3P 171	181	213	219
	4P 171	181	213	219
G	3P 80	80	96	96
	4P 80	80	96	96

LC1	F115 F150	F185 F225	F265	F330
c <sup>(2)</sup>	3P 171	181	213	219
	4P 171	181	213	219
G	3P 80	80	96	96
	4P 80	80	96	96

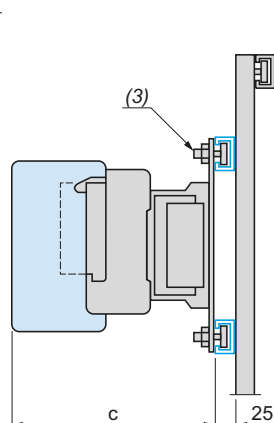
COORD.

Ref.

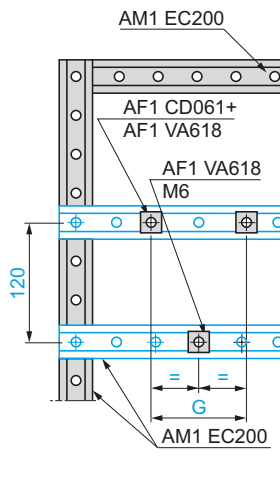
High power contactors

#### LC1F

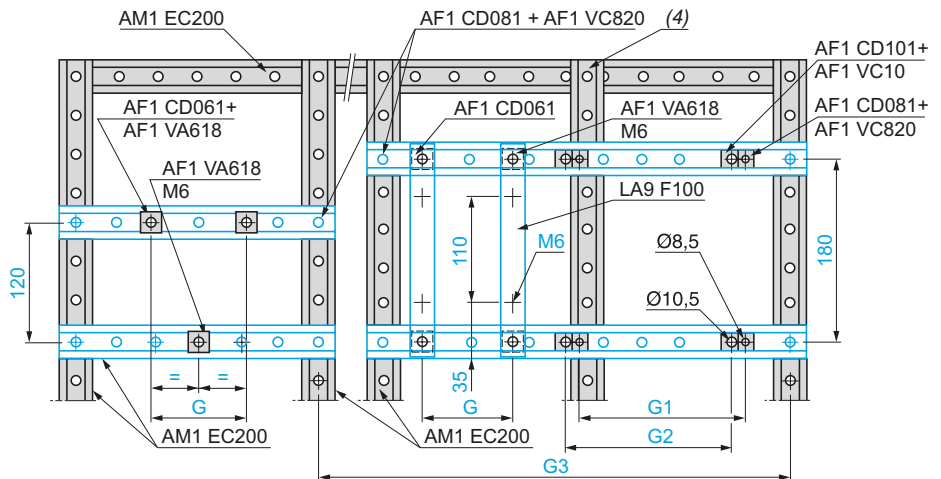
On 2 notched rails AM1EC...



#### LC1F115 to F330



#### LC1F400 to F800



LC1	F115, F150	F185, F225	F265	F330	F400	F500	F630	F780	F800
c	3P 165 <sup>(5)</sup>	176	207	213	219	232	255	255	255
	4P 165 <sup>(5)</sup>	176	207	213	219	232	255	255	—
G (M6)	3P 80	80	96	96	—	—	—	—	—
	4P 80	80	96	96	—	—	—	—	—
G1 (Ø 8.5)	3P —	—	—	—	80	80	—	—	—
	4P —	—	—	—	80	140	—	—	—
G2 (Ø 10.5)	3P —	—	—	—	—	—	180	See page B9/55	180
	4P —	—	—	—	—	—	240	See page B9/55	—

(1) Power terminal protection shroud (see page B9/14).

(2) See X1 (minimum electrical clearance) pages B9/54 and B9/55.

(3) AF1CD... and AF1VA...

(4) This AM1EC200 upright is required when G2 or G3 is greater than 700 mm (please consult your Regional Sales Office).

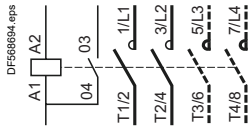
(5) + 6 mm with time-delay block on LC1F.



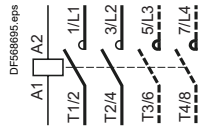
#### Contactors

##### 2, 3 and 4-pole contactors

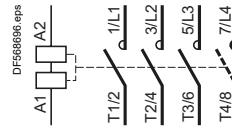
LC1F115 to F630 , F1250  
(coil LX1F ~)



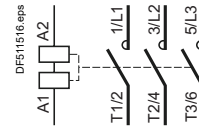
LC1F115 to F630 , F1250 (coil LX4F ~)  
LC1F115 to F265 (coil LX9F ~)  
LC1F800 (coil LX8 F ~ / ~)



LC1F780 ~ or ~



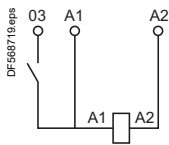
LC1F1000  
LC1F1400 ~ or ~, LC1F1700 ~ or ~  
LC1F2100 ~ or ~, LC1F2600 ~ or ~



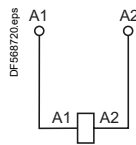
#### Coils

##### Standard ~ coils

LX1FJ...FL  
LX1FH0422...FH3802

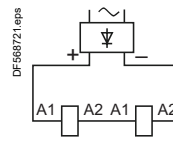


LX1FH0202...FH0362  
LX1FH4402...FH10002  
LX1F8●



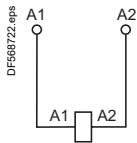
LX1FX

Rectifier supplied and fixed on the contactor



##### Standard ~ coils

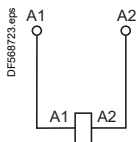
LX4FF, FG, FH, FJ, FK, FL, FX <sup>(1)</sup>, LX4F8●



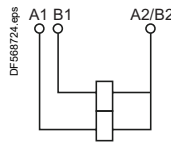
<sup>(1)</sup> 2 coils in series.

##### Special ~ coils

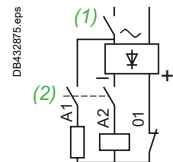
LX9FF, FG



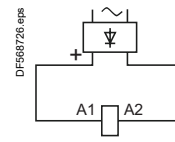
LX9FH●●●2



LX9FJ, FK, FL



LX4F8●

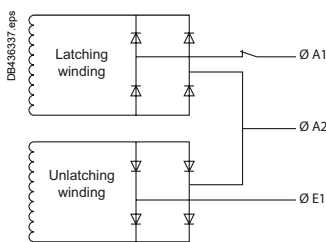


<sup>(1)</sup> Breaking on ~ side. Drop-out time 50 ms.

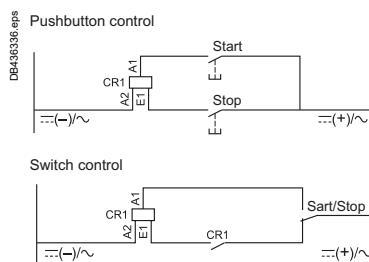
<sup>(2)</sup> Breaking on ~ side. Drop-out time 20 ms.

##### Specific wiring diagrams for CR1F contactors

###### Internal latching/unlatching diagram

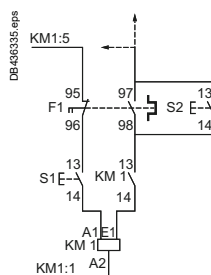
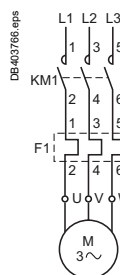


###### Control diagrams



Warning: terminal A2 is common to both windings in all cases.

##### Contactors CR1F with thermal overload relay





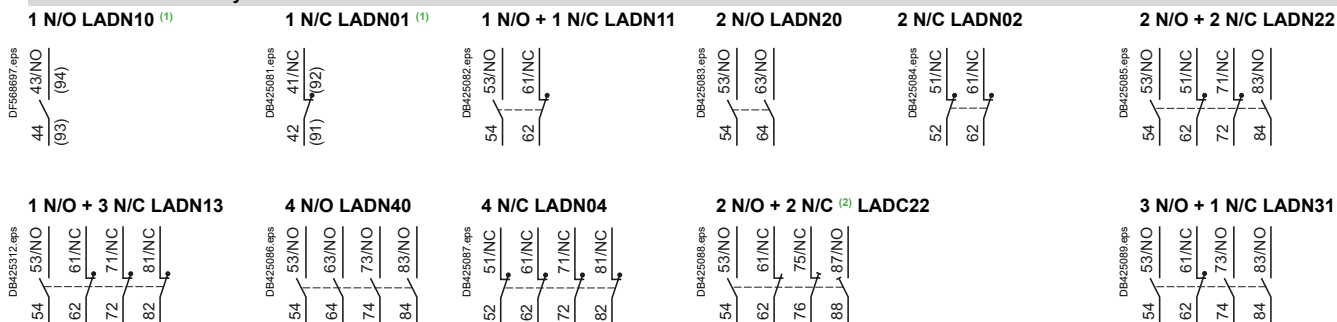
# TeSys

## TeSys F High power contactors

### Schemes

#### Add-on blocks

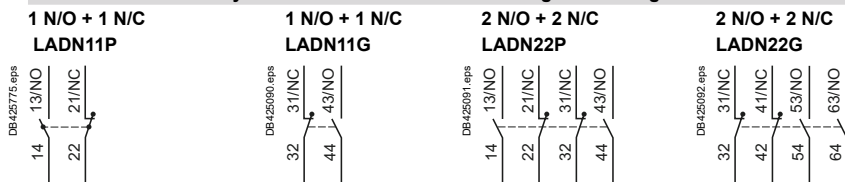
##### Instantaneous auxiliary contacts



<sup>(1)</sup> Items in brackets: See "TeSys D contactors".

<sup>(2)</sup> 1 N/O + 1 N/C make before break.

Instantaneous auxiliary contacts with terminal referencing conforming to standard EN 50012 (References: pages B9/10 and B9/11)

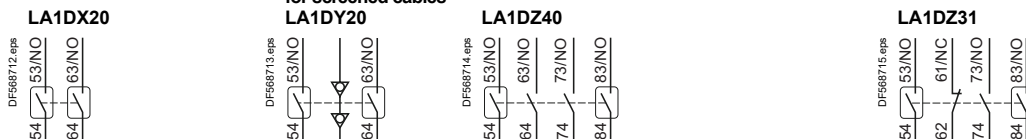


##### Dust and damp protected instantaneous auxiliary contacts

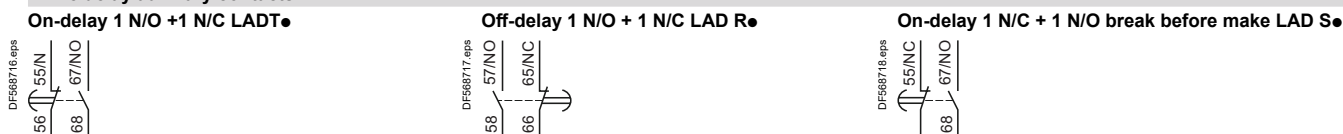
COORD

2 N/O (24-50 V)      2 N/O (5-24 V) with 2 earth terminals for screened cables      2 N/O protected (24-50 V) + 2 N/O standard      2 N/O protected (24-50 V) + 1 N/O + 1 N/C standard

Ref.



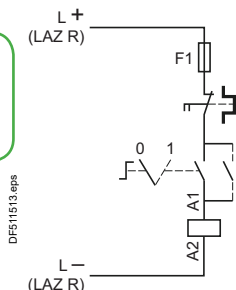
##### Time delay auxiliary contacts



##### Capacitive delayed opening devices for TeSys F contactors

LAZR9●● + LC1F

High power contactors





High power  
contactors

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Electric

B9/63



# TeSys

## TeSys V Vacuum high power contactors

### Characteristics

Selection					
Contactor size			LC1V160	LC1V320	LC1V610
For utilisation category AC-3					
Maximum operational current in AC-3	A		160	320	610
Rated operational power P (standard power ratings of motors)	230 V	kW	45	90	160
	400 V	kW	75	160	300
	525 V	kW	110	220	400
	690 V	kW	150	280	560
	1000 V	kW	200	400	800
	1500 V	kW	280	600	930
For 3-phase motors conforming to CSA standards					
Rated operational power P (standard power ratings of 3-phase CSA motors)	200 V	hp	50	100	150
	240 V	hp	60	125	200
	380 V	hp	100	200	300
	480 V	hp	125	250	400
	600 V	hp	150	300	500
	800 V	hp	200	400	700
	1000 V	hp	250	500	1000
	1500 V	hp	400	800	1300
For switching 3-phase capacitors					
Rated operational power P	240 V	kVAR	47	94	176
	480 V	kVAR	95	190	356
	600 V	kVAR	100	200	400
	1500 V	kVAR	250	500	1000
For switching the primaries of 3-phase transformers (LV/LV)					
Rated operational power P	208 V	kVA	20	41	81
	240 V	kVA	23	47	94
	480 V	kVA	47	94	188
	600 V	kVA	59	117	234

#### Environment characteristics

Contactor type			LC1V160	LC1V320	LC1V610
Shock resistance (1/2 sine wave = 11 ms)	Contacts closed		10 gn	10 gn	10 gn
	Contacts open		10 gn	10 gn	10 gn
Vibration resistance	10...500 Hz		2 gn	2 gn	2 gn
Operating altitude	Above sea level	Maximum	m	3600	3600
	Below sea level	Minimum	m	2500	4500
Ambient air temperature around the device	Storage	°C	-40...+80	-40...+80	-40...+80
	Operation 0.8... 1.1 Uc	°C	-5...+55	-5...+55	-5...+55
	Permissible for operation at Uc	°C	-10...+75	-10...+75	-10...+75
Degree of protection	Conforming to IEC 60529		IP 00	IP 00	IP 00
Operating position			Any	Any	Any
Cabling	Cable c.s.a.	mm <sup>2</sup>	70	185	2 x 185
	Key for hex. screws	mm	Allen 4	20	20
	Tightening torque	N.m	14	39	39

#### Control circuit characteristics

Rated insulation voltage (Ui)	To earth	V	2000	2000	2000
Consumption	Inrush	VA	300	600	1700
	Sealed	VA	30	20	28
Permissible control circuit voltage			0.8...1.1 Uc	0.8...1.1 Uc	0.8...1.1 Uc
Closing time <sup>(1)</sup>		ms	18...22	24...32	24...32
Opening time <sup>(1)</sup>		ms	95...115	95...115	95...115

<sup>(1)</sup> The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles. The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.



# TeSys

## TeSys V Vacuum high power contactors

### Characteristics

Main pole characteristics				
Contactor type		LC1V160	LC1V320	LC1V610
Rated insulation voltage (Ui)	V	1500	1500	1500
Rated impulse withstand voltage (Uimp)	kV	8	8	8
Conforming to standards		EN 60947-4-1 - IEC 60947-4-1		
Conventional rated thermal current (Ith)	A	160	320	630
Rated operational current (Ie)	$\theta \leq 40^\circ\text{C AC-1}$	A 160	320	630
	$\theta \leq 55^\circ\text{C AC-3}$	A 160	320	610
	$\theta \leq 55^\circ\text{C AC-4}$	A 130	270	540
Electrical durability in millions of operating cycles (400 V at I max)	AC-1	1.2	1	1
	AC-3	1.6	1.5	1.5
	AC-4	0.18	0.15	0.12
Mechanical durability	In millions of operating cycles	5	2.5	2
Maximum operating rate in operating cycles per hour	Mechanical	1200	1200	1200
	AC-1	900	900	900
	AC-3	900	900	900
	AC-4	450	450	450
Maximum making capacity (I <sub>ms</sub> )	Ue = 1500 V To IEC 60947	A 1900	3800	7300
Maximum breaking capacity (I <sub>ms</sub> )	Ue = 1500 V To IEC 60947	A 1600	3200	6100
Maximum permissible current	For 1 s	A 2400	4500	9000
	For 2 s	A 2000	3750	7580
	For 10 s	A 1600	3200	6100
	For 30 s	A 960	1920	3600
Short-circuit protection at Ie in cat. AC-3 max.	aM fuse	A 160	400	630

Auxiliary contact characteristics				
Rated insulation voltage (Ui)	V	690		
Conventional rated thermal current (Ith)	A	10		
Rated operational current (Ie)	AC-15, 230 V	A 0.78		
	AC-15, 400 V	A 0.45		
	AC-15, 500 V	A 0.35		
	DC-13, 24 V	A 1.1		
	DC-13, 110 V	A 0.24		
	DC-13, 220 V	A 0.12		
Cabling	Cable c.s.a.	mm <sup>2</sup> 2.5		
Short-circuit protection	gG fuse	A 10		
Operating time <sup>(1)</sup> (at 100 % of Uc)	"C"	ms ±5		
	"O"	ms ±5		

(1) Operating time in relation to the main contacts.



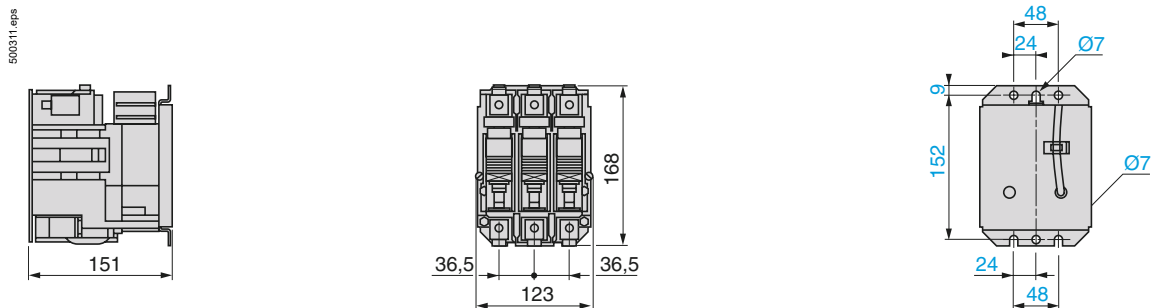
# TeSys

## TeSys V Vacuum high power contactors

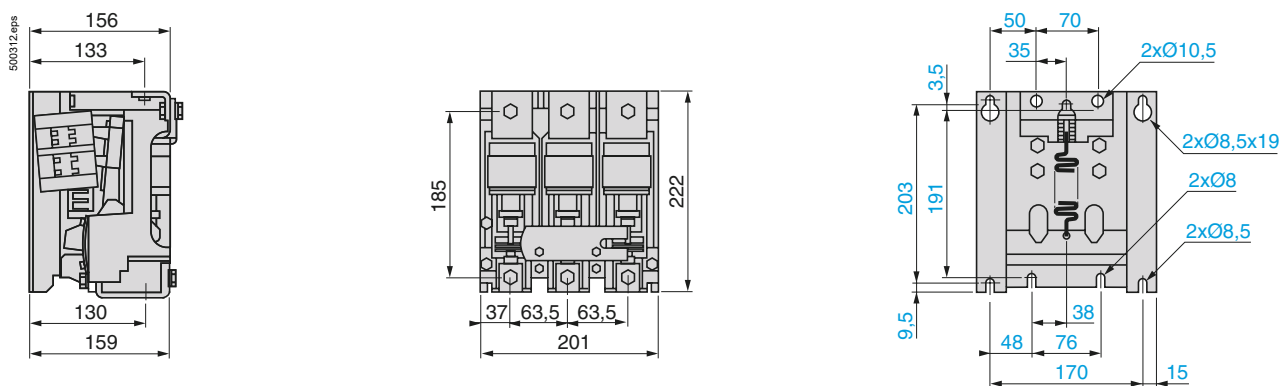
### Dimensions, mounting, schemes

#### Dimensions, mounting

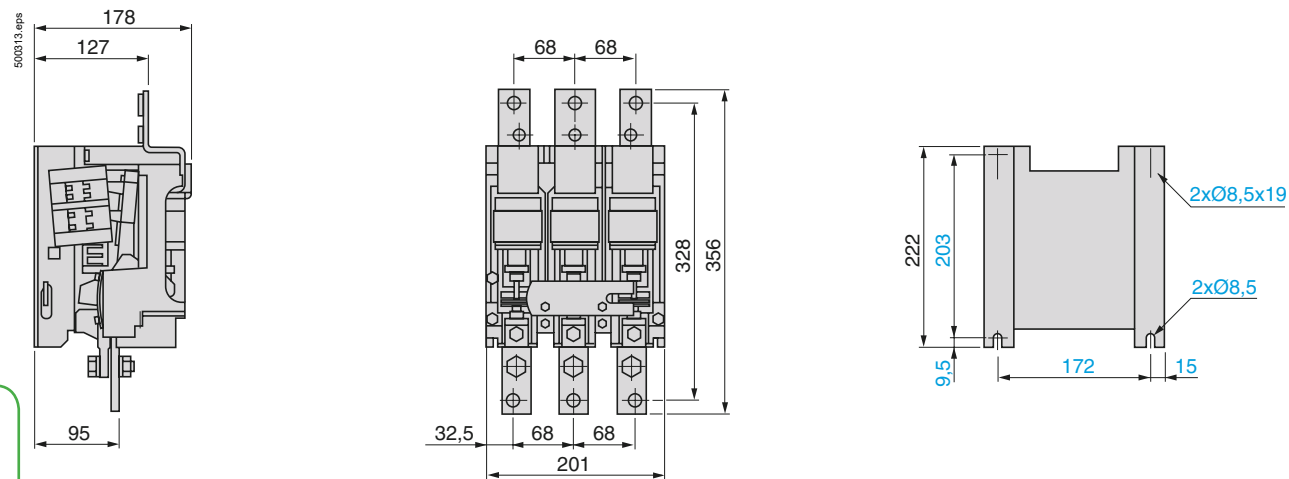
##### LC1V160



##### LC1V320



##### LC1V610

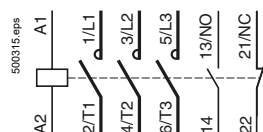


#### Schemes

##### LC1V160

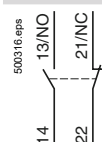


##### LC1V320, V610

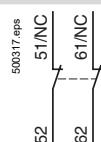


#### Auxiliary contact blocks

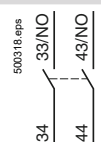
##### LA1VN11 1 N/O & 1 N/C



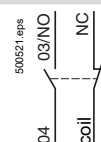
##### LA1VN02 2 N/C



##### LA1VN20 2 N/O



##### LA1VN11X 1 N/O



References:

page B9/4

B9/66

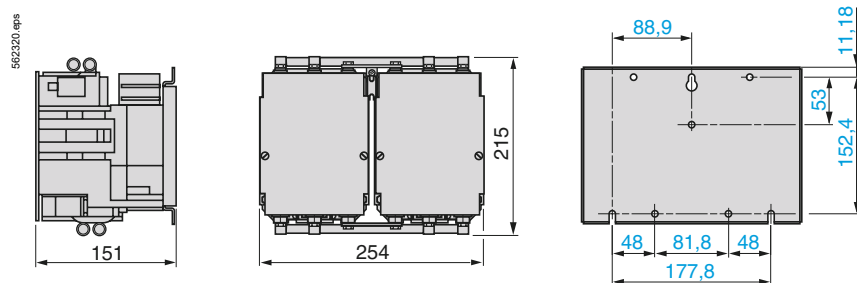
Life Is On

Schneider  
Electric

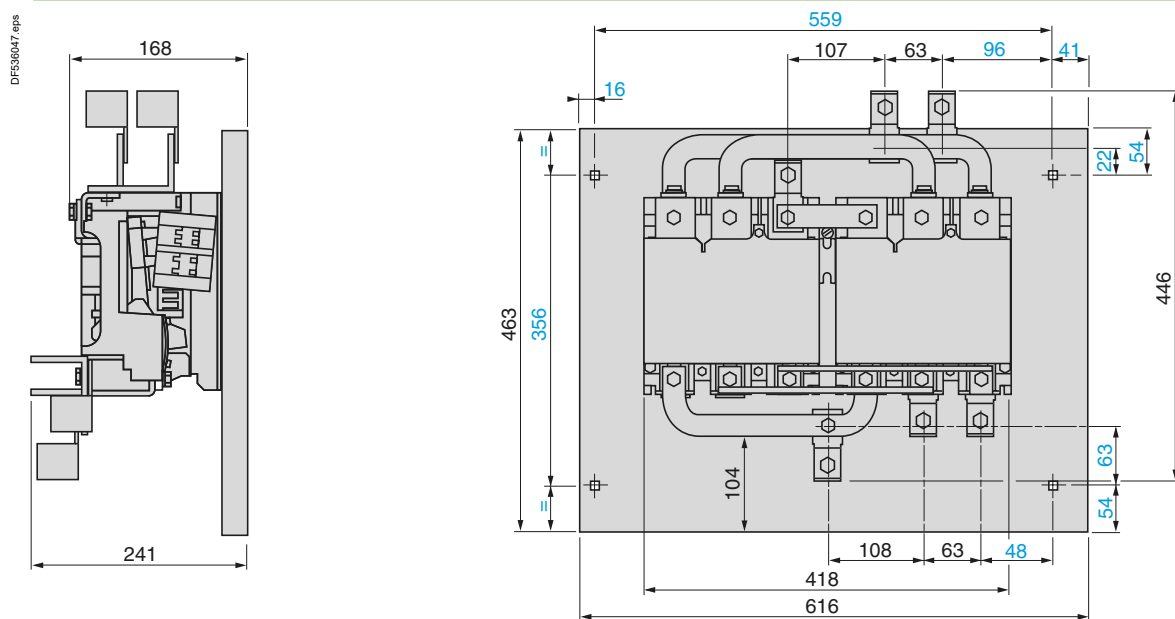


#### Dimensions, mounting

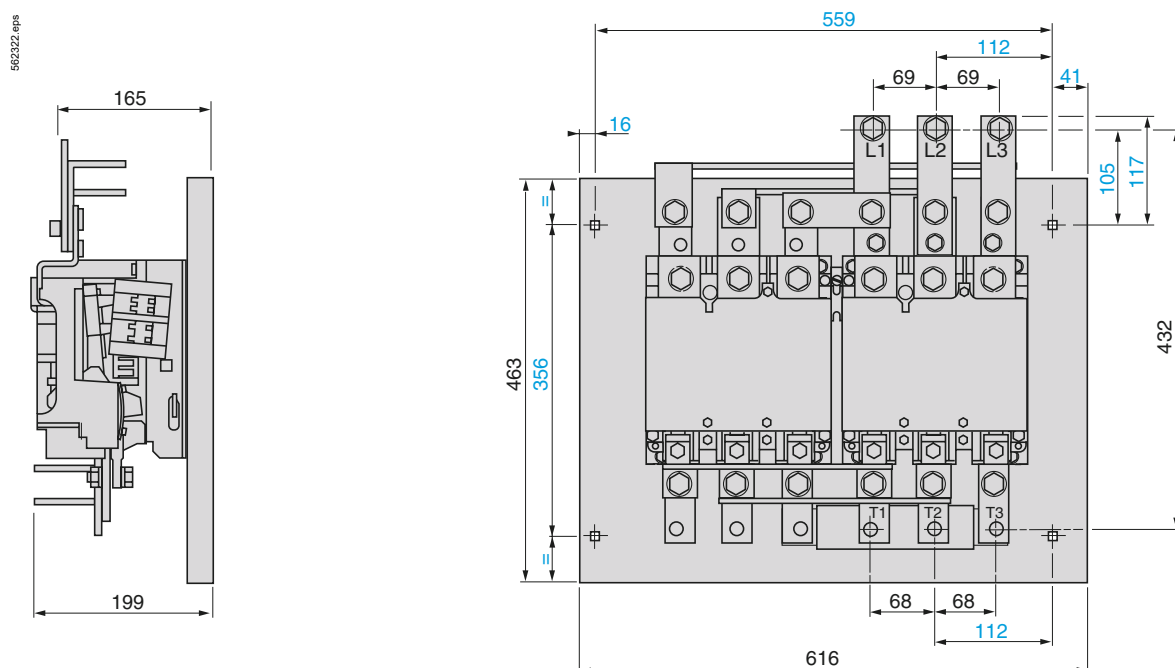
##### LA9V974 + 2 x LC1V160



##### LC2V320



##### LC2V610





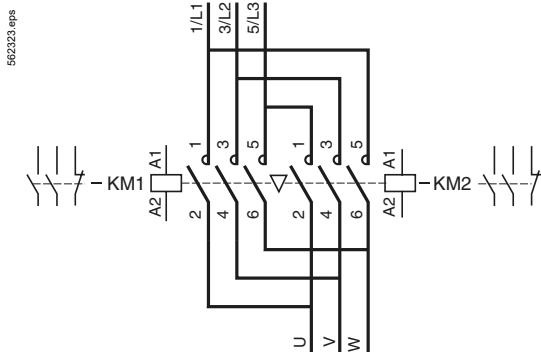
# TeSys

## TeSys V Vacuum high power reversing contactors

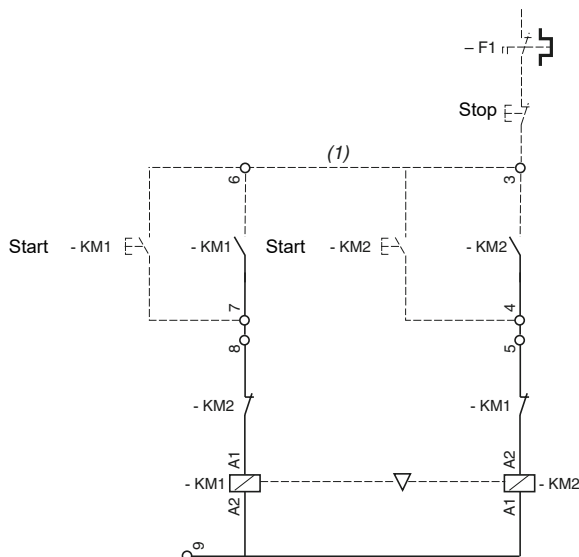
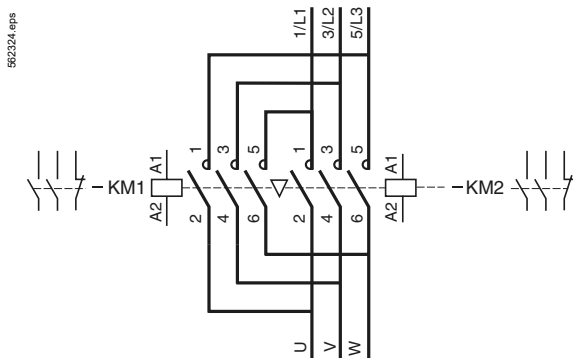
### Schemes

#### Schemes

##### LA9V974 + 2 x LC1V160



##### LC2V320



(1) Dotted line indicates wiring to be installed by the customer.

High power  
contactors



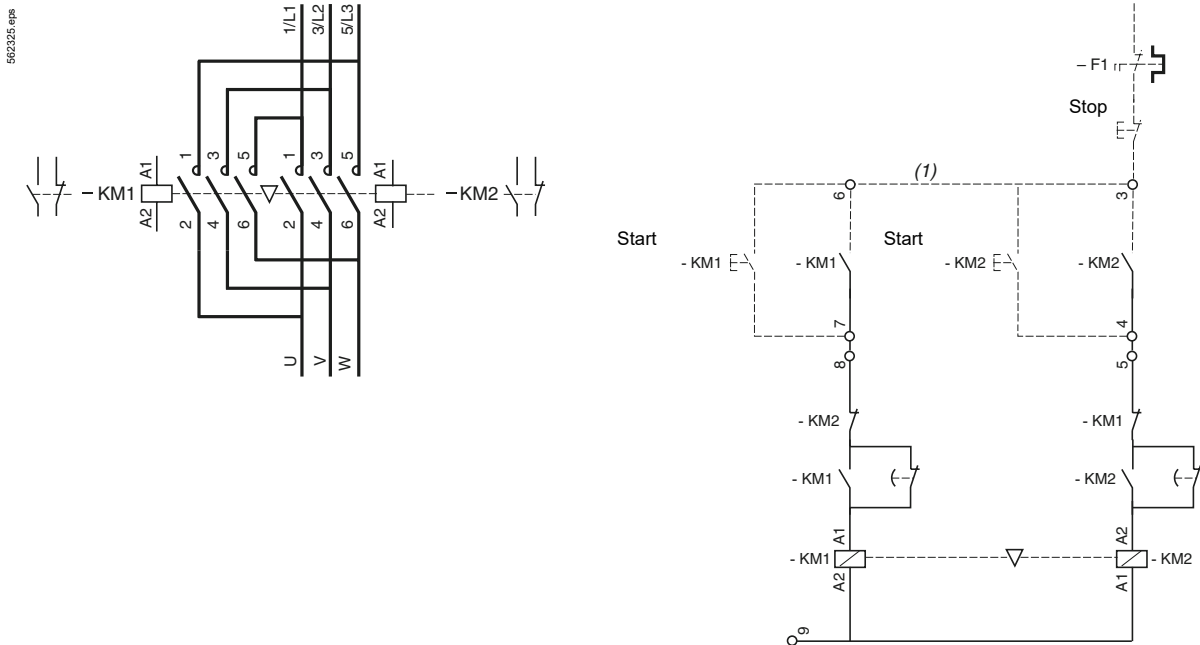
# TeSys

## TeSys V Vacuum high power reversing contactors

### Schemes

#### Schemes

#### LC2V610



(1) Dotted line indicates wiring to be installed by the customer.

Ref.



High power  
contactors





LC1FG150



LC1FG265

Ref.



High power  
contactors

### Shockproof contactor specificity

In an environment subject to severe mechanical shocks, unwanted closing of a contactor's poles and the serious consequences of this, is not permissible.

Shockproof contactors **LC1FG150** to **FG630** are equipped with an auxiliary electromechanical device which ensures that the contactor is mechanically locked in the "open" position when it's main electromagnet is not energised.

If the contactor is subjected to mechanical impact, from back to front or from front to back, accidental closing of the poles is then impossible.

In addition, accidental opening of the poles (when the contactor is in the "on" position), is virtually impossible due to the significant pull-in force characteristic of these contactors.

### Applications

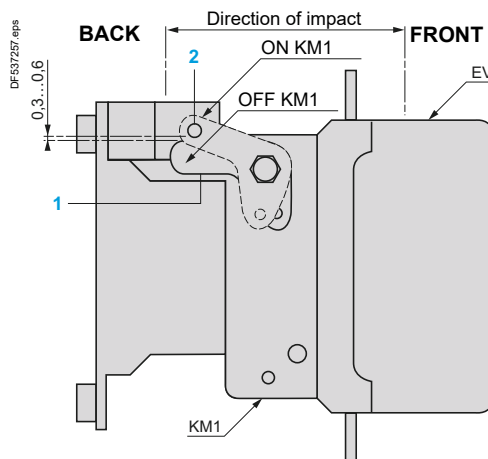
- **Marine:** on-board equipment, windlasses, capstans, winches, etc...
- **Military equipment:** land, sea, launching silos.
- **Heavy mechanical handling systems:** travelling cranes, cranes, gantries.
- **Conveying and handling:** lifts, hoists, conveyors.
- **Equipment for power stations.**
- **Distribution boards.**



### Description of shockproof device

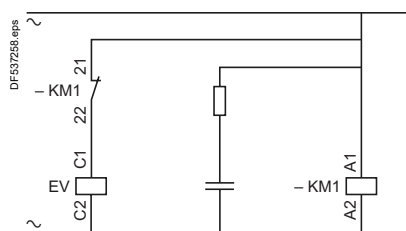
Shockproof contactors **LC1FG●●●** are equipped with:

- a lever **1** that is rotated by the core of the contactor's electromagnet.
- an auxiliary electromagnet (EV) for the locking function.
- an RC circuit (Resistor-Capacitor) to limit overvoltage.



### Operation

- In the 'off' position (contactor open and not energised) the core **2** of the electromagnet (EV) locks the lever **1** and therefore the contactor.
  - The coils (KM1) and (EV) are energised simultaneously, the core **2** releases the lever **1** and allows the contactor to close.
  - De-energisation of the locking electromagnet (EV) is achieved by an auxiliary contact within the contactor.
- The core **2** rests freely in lever **1**.
- On de-energisation of coil KM1, the moving contact drops out. Core **2**, under spring pressure, once again locks lever **1**.



Ref.



High power  
contactors



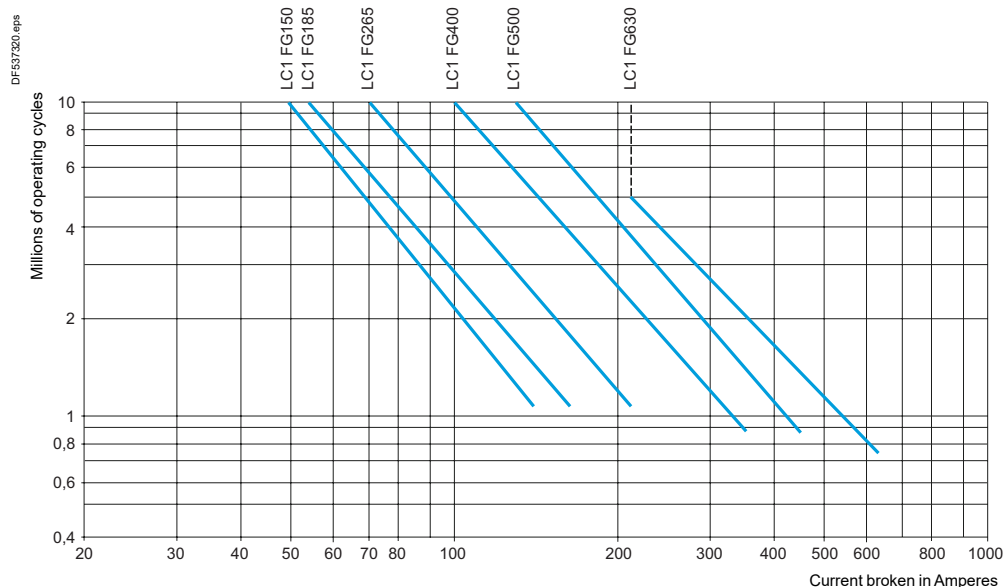
Use in category AC-3 ( $U_e \leq 440$  V)Operational current and power ( $\theta \leq 55$  °C)

Contactors			LC1FG150	LC1FG185	LC1FG265	LC1FG400	LC1FG500	LC1FG630
Operational current		A	150	185	265	400	500	630
Operational power Standard power ratings of motors)	220/230 V	kW	40	55	75	110	147	200
		hp	54	75	100	150	200	270
	380/400 V	kW	75	90	132	200	250	335
		hp	100	185	180	270	340	450
	415 V	kW	80	100	140	220	280	375
		hp	110	136	180	300	380	500
	440 V	kW	80	100	140	250	295	400
		hp	110	136	190	340	400	545
	500 V	kW	90	110	160	257	355	400
		hp	125	150	220	350	480	545
	660/690 V	kW	100	110	160	280	335	450
		hp	136	150	220	380	450	600
	1000 V	kW	65	100	147	185	335	450
		hp	85	136	200	250	450	610

Ref.

Maximum operating rate (operating cycles/hour) <sup>(1)</sup>

On-load factor	Operational power	LC1FG150	LC1FG185	LC1FG265	LC1FG400	LC1FG500	LC1FG630
$\leq 85$ %	P	750	750	750	500	500	500
$\leq 85$ %	0.5 P	2000	2000	2000	1200	1200	1200
$\leq 25$ %	P	1200	1200	1200	1200	1200	1200

(1) Depending on the operational power and the on-load factor ( $\theta \leq 55$  °C).Electrical durability in utilisation category AC-3 ( $U_e \leq 440$  V)

Control of 3-phase asynchronous squirrel cage motors with breaking whilst running.

The current broken ( $I_e$ ) in category AC-3 is equal to the rated operational current of the motor.**Example:**Asynchronous motor with P = 55 kW -  $U_e$  = 380 V -  $I_e$  = 105 A

4 million operating cycles required.

The above selection curves show the contactor rating needed: **LC1FG265**.

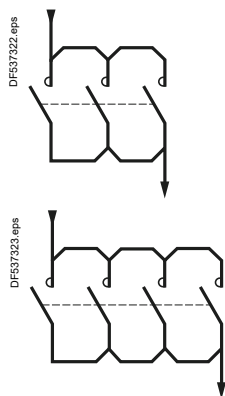


### Use in category AC-1 ( $U_e \leq 440$ V)

Contactors				LC1FG150	LC1FG185	LC1FG265	LC1FG400	LC1FG500	LC1FG630
Connection	Cable	C.s.a.	mm <sup>2</sup>	120	150	240	–	–	–
	Bar	Number		–	–	–	2	2	2
		C.s.a.	mm	–	–	–	30 x 5	40 x 5	60 x 5
Maximum operating rate in operating cycles/hour				600	600	600	600	600	600
Operational current AC-1	$\leq 40$ °C	A		250	270	350	500	700	1000
		A		220	240	300	430	580	850
		A		170	180	250	340	500	700

(1) Only for operation with coil supplied at  $U_c$ .

### Increase in operational current by parallel connection of poles



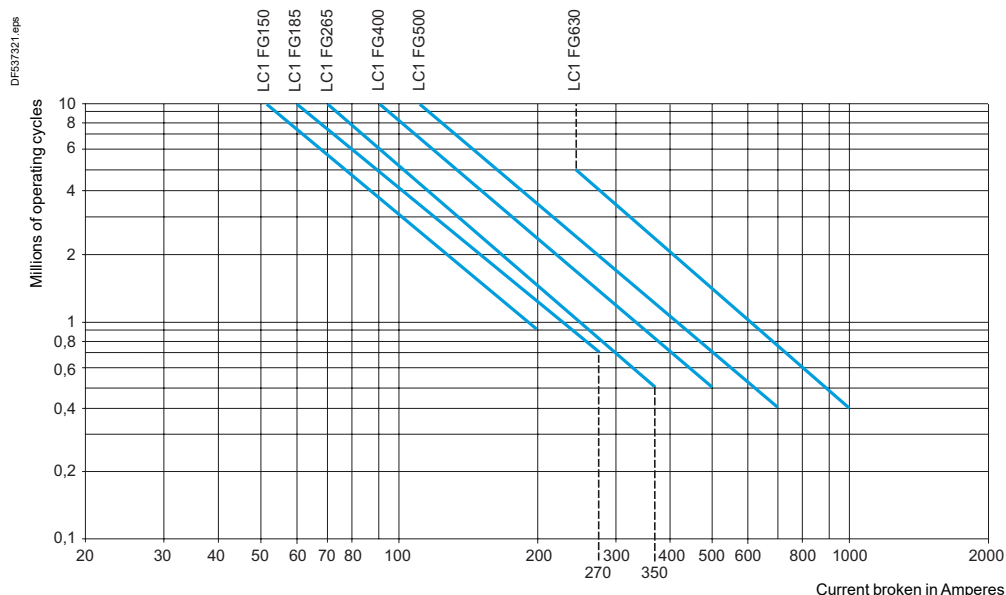
Apply the following multiplying factors to the current values given above.

The factors take into account the often unbalanced current distribution between the 2 poles:

- 2 poles in parallel:  $K = 1.6$
- 3 poles in parallel:  $K = 2.25$
- 4 poles in parallel:  $K = 2.8$ .

Recommended connection scheme to equalise the currents in each pole (see opposite).

### Electrical durability in utilisation category AC-1 ( $U_e \leq 440$ V)



#### Example:

Control of resistive circuits ( $\cos \varphi \geq 0.95$ ).

The current broken ( $I_c$ ) in category AC-1 is equal to the current ( $I_e$ ) normally drawn by the load.

$U_e = 220$  V -  $I_c = I_e = 300$  A -  $\theta = 40$  °C.

1 million operating cycles required.

The above selection curves show the contactor rating needed: **LC1FG400**.



## Thermal limits in utilisation categories AC-2/AC-4

Contactors		LC1 FG150	LC1 FG185	LC1 FG265	LC1 FG400	LC1 FG500	LC1 FG630
Thermal limit zone	Operating cycles/hour <sup>(1)</sup> and on-load factor	Maximum current broken according to the duty requirements (thermal limit, ambient temperature ≤ 55 °C)					
A	From 150 and 15 % to 300 and 10 %	310	380	560	780	1100	1400
B	From 150 and 20 % to 600 and 10 %	280	350	500	700	950	1250
C	From 150 and 30 % to 1200 and 10 %	240	300	400	600	750	950
D	From 150 and 55 % to 2400 and 10 %	190	240	320	450	600	720
E	From 150 and 85 % to 3600 and 10 %	145	170	230	350	500	660

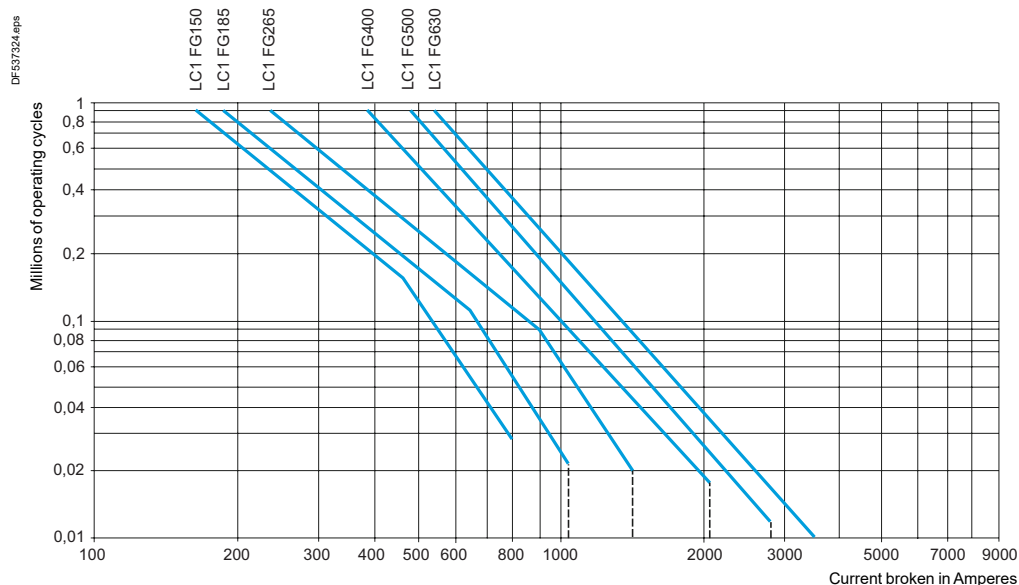
(1) Do not exceed the maximum limit for the mechanical operating cycles.

## Counter current braking (plugging)

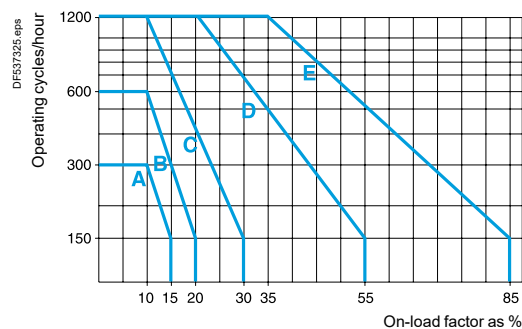
The current varies from the maximum plug-braking current to the rated motor current.

The current made must be compatible with the making and breaking capacities of the contactor.

In most cases, breaking occurs at a current value close to the locked rotor current and contactor selection can therefore be made using the criteria for utilisation categories AC-2 and AC-4.

Electrical durability in utilisation categories AC-2/AC-4 ( $U_e \leq 440$  V)

## Example: Contactor selection



For an on-load factor of 10 % at 400 operating cycles per hour, the curve on the left indicates zone B. If the current broken is 600 A, the above table leads to selection of an **LC1FG400** contactor. Referring to the electrical durability curves, it can be seen that the contactor will be able to perform 350 000 operating cycles. Where a higher value of electrical durability is required, 1 million operating cycles for example, an **LC1FG630** contactor would be recommended.



## Switching 3-phase capacitors

Capacitors, together with the circuits to which they are connected, form oscillatory circuits which can, at the moment of switch-on, give rise to high transient currents (> 180 I<sub>n</sub>) at high frequencies (1 to 15 kHz).

The contactors are used for direct switching. The values of peak current at switch-on must not exceed the values indicated below.

An inductor or an early break resistor may be inserted in each of the three phases supplying the capacitors to reduce the peak current, if necessary. This must be done when switching multiple step capacitor banks.

Inductance values are determined according to the selected operating temperature: please refer to our "Motor starter solutions - Control and protection components" catalogue.

In addition, in accordance with standards IEC 60070, NF C 54 100, VDE 0560, the switching contactor must be able to withstand a continuous current of 1.43 times the rated current of the capacitor bank step being switched. The rated operational powers given in table below take this overload into account.

Short-circuit protection is normally provided by g1 fuses rated at 1.3 to 1.6 I<sub>n</sub>.

## Maximum operational power of contactors

Maximum operating rate: 120 operating cycles/hour.

Electrical durability at maximum load: 100 000 operations.

With choke inductors connected, where necessary.

Operational power at 50/60 Hz						Maximum peak current	Contactor to be used
$\theta \leq 40\text{ }^{\circ}\text{C}$			$\theta \leq 55\text{ }^{\circ}\text{C}$				
220 V	400 V	600 V	220 V	400 V	600 V		
240 V	440 V	660 V	240 V	440 V	660 V		
kvar	kvar	kvar	kvar	kvar	kvar	A	
60	100	135	40	85	90	3200	LC1FG150
70	125	160	50	100	100	3500	LC1FG185
90	160	225	75	125	125	5000	LC1FG265
125	220	300	100	160	200	8000	LC1FG400
180	300	400	125	220	300	10 000	LC1FG500
250	400	600	190	350	500	12 000	LC1FG630

## Switching the primaries of 3-phase transformers (LV/LV)

When a transformer is switched on, there is generally an initial current surge which can reach 20 to 40 times the rated current for the power ratings shown below.

This current reaches its peak value almost instantaneously and then decreases in a largely exponential manner, quickly dropping back down to its steady state value.

## Contactor selection

Operating rate less than 120 operating cycles/hour.

Maximum operational voltages: 690/1000 V 50/60 Hz <sup>(2)</sup>.

The value of the peak magnetising current must be lower than the values indicated below.

Maximum ambient temperature: 55 °C.

Contactor		LC1FG150	LC1FG185	LC1FG265	LC1FG400	LC1FG500	LC1FG630
Maximum permissible current peak at switch-on	A	1700	2800	3500	5500	6800	9000
Maximum operational power <sup>(1)</sup>	220 V	kVA	25	40	50	75	100
	380 V	kVA	50	75	90	130	170
	415/440 V	kVA	55	80	100	140	190
	500 V	kVA	65	95	110	170	225
	660 V	kVA	80	120	140	200	270
	1000 V	kVA	100	150	200	250	375

<sup>(1)</sup> Maximum operational power corresponding to a current peak at switch-on of 30 I<sub>n</sub>.

<sup>(2)</sup> Refer to page B9/80 and B9/81 for details on operational voltage.



Use in category DC-1 (resistive loads; time constant L/R ≤ 1 ms)							
Rated operational current I <sub>e</sub>							
Operational voltage (U <sub>e</sub> )	Number of poles to be wired in series	Contactors					
		LC1 FG150	LC1 FG185	LC1 FG265	LC1 FG400	LC1 FG500	LC1 FG630
V		A	A	A	A	A	A
24	1	160	220	300	400	600	850
	2	160	220	300	400	600	850
	3	160	220	300	400	600	850
	4	160	220	300	400	600	850
48/75	1	160	220	300	400	600	850
	2	160	220	300	400	600	850
	3	160	220	300	400	600	850
	4	160	220	300	400	600	850
125	1	—	—	—	—	—	—
	2	130	170	300	400	550	850
	3	130	170	300	400	600	850
	4	130	170	300	400	600	850
225	1	—	—	—	—	—	—
	2	100	150	250	350	450	700
	3	130	170	300	400	600	850
	4	130	170	300	400	600	850
300	3	100	150	250	350	450	700
	4	130	170	300	400	600	850
460	4	100	150	250	350	450	700
Use in category DC-2 to DC-5 (inductive loads; time constant L/R ≤ 15 ms)							
Rated operational current I <sub>e</sub>							
Operational voltage (U <sub>e</sub> )	Number of poles to be wired in series	Contactors					
		LC1 FG150	LC1 FG185	LC1 FG265	LC1 FG400	LC1 FG500	LC1 FG630
V		A	A	A	A	A	A
24	1	140	180	280	350	550	850
	2	140	180	280	350	550	850
	3	140	180	280	350	550	850
	4	140	180	280	350	550	850
48/75	1	140	180	280	350	550	850
	2	140	180	280	350	550	850
	3	140	180	280	350	550	850
	4	140	180	280	350	550	850
125	1	—	—	—	—	—	—
	2	100	140	250	350	550	850
	3	120	160	280	350	550	850
	4	120	160	280	350	550	850
225	1	—	—	—	—	—	—
	2	80	100	200	280	450	700
	3	100	140	250	350	550	850
	4	120	160	280	350	550	850
300	3	80	100	200	280	450	700
	4	120	160	280	350	550	850
460	4	80	100	200	280	450	700

Ref.



High power contactors



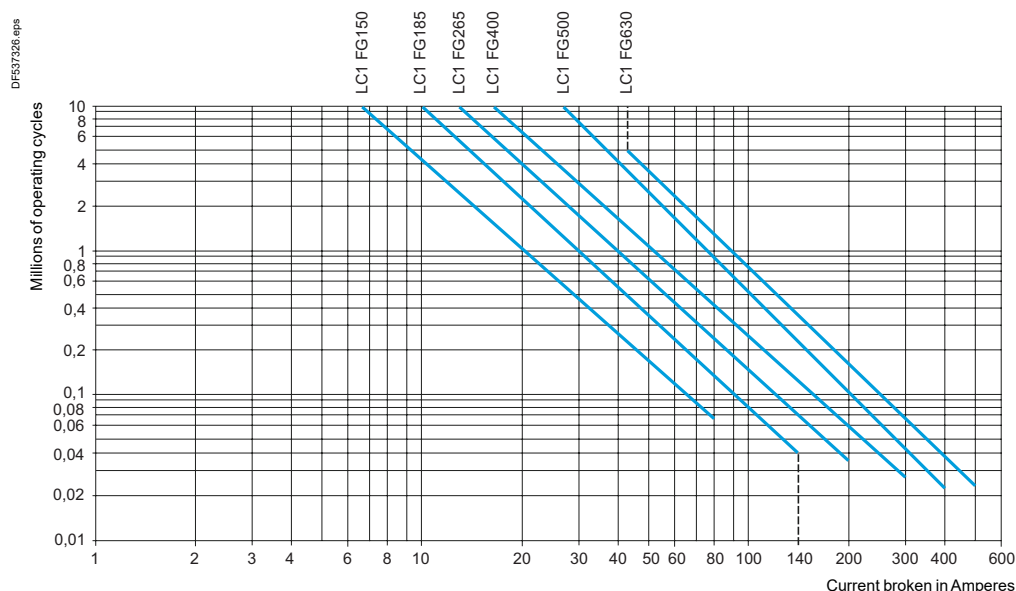
# TeSys

## TeSys FG Shockproof high power 3-pole contactors

### Characteristics - Durability (DC)

#### Electrical durability

Utilisation categories DC-1 to DC-5



#### Determining the electrical durability

The electrical durability can be read directly from the curve above, having previously calculated the power broken  $P_c$ . The following table gives, for each utilisation category, the value of  $P_c$  according to the operational current  $I_e$  and the operational voltage  $U_e$ .

Utilisation categories	$P_c$ (Power broken)
<b>DC-1</b> Non-inductive loads	$P_c = U_e \times I_e$
<b>DC-2</b> Shunt motors, breaking whilst running	$P_c = 0.1 U_e \times I_e$
<b>DC-3</b> Shunt motors, reversing	$P_c = U_e \times 2.5 I_e$
<b>DC-4</b> Series wound motors, breaking whilst running	$P_c = 0.3 U_e \times I_e$
<b>DC-5</b> Series wound motors, reversing	$P_c = U_e \times 2.5 I_e$
<b>Counter current braking (plugging)</b>	$P_c = 1.5 U_e \times 1.5 I_e$

#### Example:

Series wound motor, breaking whilst motor running, category DC-4.

$P = 50 \text{ kW}$ ,  $U_e = 200 \text{ V}$ ,  $I_e = 250 \text{ A}$ .

Select contactor **LC1FG265** with 3 poles in series.

The power broken is:  $P_c = 0.3 U_e \times I_e = 0.3 \times 200 \times 250 = 15 \text{ kW}$ .

The electrical durability read from the curve is 8 million operating cycles.

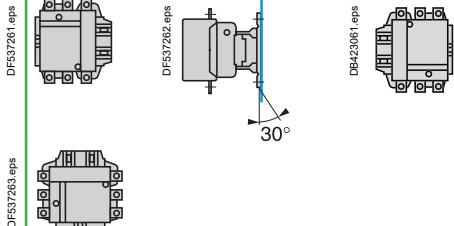
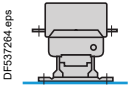
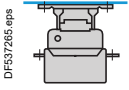
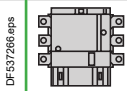
#### Maximum operating rate

The following operating rate used at  $I_e$  must not be exceeded: 120 operating cycles/hour.

#### Use of poles in parallel

The electrical durability is equal to the number of operating cycles performed by a pole, multiplied by the number of poles in parallel, multiplied by a coefficient of 0.70.



Environment			
Contactor type			LC1FG150
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1	V	1000
Rated impulse withstand voltage (Uimp)	Coil not connected to the power circuit	kV	8
Conforming to standards			IEC/EN 60947-4-1
Product certifications			N.A.T.O.
Degree of protection	Conforming to IEC 60529		IP 20 front face with shrouds LA9F
Ambient air temperature around the device	Storage	°C	-60...+80
	Operation	°C	-5...+55
	Permissible at Uc <sup>(1)</sup>	°C	-40...+70
Maximum operating altitude	Without derating	m	3000
Operating positions	Without derating		
	With derating <sup>(3)</sup>		<p><b>Fixing A</b></p>  <p><b>Fixing B</b></p> 
Shock resistance <sup>(2)</sup>	Not to be used		
			<p>12 g, 50 ms on the three axes: X, Y, Z</p> <p>15 g, 11 ms on the three axes: X, Y, Z</p>

<sup>(1)</sup> In these conditions, it is recommended that coils LX9F be used for contactor sizes FG150 to FG265.

<sup>(2)</sup> In the least favourable direction, without change of contact state (coil at Uc).

<sup>(3)</sup> Horizontal fixing:

- the operational current AC-1 is equivalent to 80 % of the value indicated in the catalogue
- breaking and making capacities not guaranteed
- mechanical and electrical durabilities not guaranteed.

#### Derating of pull-in and drop-out voltage

Contactors LC1		FG150	FG185	FG265	FG400	FG500	FG630
Fixing A	Pull-in	75 %	75 %	75 %	80 %	80 %	80 %
	Drop-out	105 %	105 %	105 %	110 %	110 %	110 %
Fixing B	Pull-in	115 %	115 %	115 %	120 %	120 %	120 %
	Drop-out	90 %	90 %	90 %	95 %	95 %	95 %



TeSys

TeSys FG Shockproof high power 3-pole contactors

Characteristics

LC1FG265

LC1FG400

LC1FG500

LC1FG630

1000

8

IEC/EN 60947-4-1

N.A.T.O.

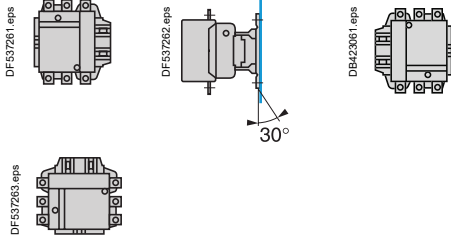
IP 20 front face with shrouds LA9F

-60...+80

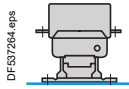
-5...+55

-40...+70

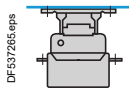
3000



A



B



12 g, 50 ms on the three axes: X, Y, Z

15 g, 11 ms on the three axes: X, Y, Z

High power  
contactors



Pole characteristics					
Contactor type			LC1FG150	LC1FG185	
Number of poles			3	3	
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-3, θ ≤ 70 °C θ ≤ 55 °C	A	150/150	185/180	
	In AC-1, θ ≤ 70 °C θ ≤ 55 °C	A	220/170	240/180	
Rated operational voltage (Ue)	Up to	V	690	690	
Frequency limits	Of the operational current (1)	Hz	25 to 200	25 to 200	
Conventional thermal current	θ ≤ 40	°C	250	275	
Rated making capacity	I rms conforming to IEC 60947-4-1	A	Making current: 10 x I in AC-3		
Rated breaking capacity	I rms conforming to IEC 60947-4-1	A	Making and breaking current: 8 x I in cat. AC-3		
Permissible short time rating No current flowing for preceding 60 minutes with θ ≤ 40 °C	For 1.5 or 10 s	A	1200	1500	
	For 30 s	A	700	920	
	For 1 mn	A	600	740	
	For 3 mn	A	450	500	
	For 10 mn	A	350	400	
Fuse protection against short-circuits (U ≤ 440 V)	Motor circuit (type aM)	A	160	200	
	With thermal overload relay (type gG)	A	200	315	
	gG fuses	A	250	315	
Average impedance per pole	At Ith and 50 Hz	mΩ	0.35	0.33	
Power dissipation per pole for the above operational currents	AC-3	W	8	12	
	AC-1	W	22	25	
Cabling Minimum c.s.a.	Bar	No. of bars	2	2	
		Bar	mm	25 x 3	
	Cable with lug		mm²	120	
	Cable with connector		mm²	120	
	Bolt diameter		mm	Ø8	
Tightening torque	Power circuit connections	N.m	18	18	

(1) Sine wave without interference. Above these values, please consult your Regional Sales Office.

(2) Ue ≤ 690 V in AC-3; Ue ≤ 1000 V in AC-1.

Ref.

High power  
contactors



# TeSys

## TeSys FG Shockproof high power 3-pole contactors

### Characteristics

LC1FG265	LC1FG400	LC1FG500	LC1FG630
3	3	3	3
265/250	400/340	500/500	630/630
300/250	430/340	580/500	850/700
1000 <sup>(2)</sup>	1000	1000 <sup>(2)</sup>	1000
25 to 200	25 to 200	25 to 200	25 to 200
350	500	700	1000
Making current: 10 x I in AC-3			
Making and breaking current: 8 x I in AC-3			
2200	3600	4200	5050
1230	2400	3200	4400
950	1700	2400	3400
620	1200	1500	2200
480	1000	1200	1600
315	400	500	630
500	630	800	800
400	500	800	1000
0.3	0.26	0.18	0.12
21	42	45	48
37	65	88	120
2	2	2	2
32 x 4	30 x 5	40 x 5	60 x 5
240	2 x 150	2 x 240	–
240	–	–	–
Ø10	Ø10	Ø10	Ø12
35	35	35	58

High power  
contactors



a.c. control circuit characteristics with LX1/LX9 coil						
Contactor type				LC1FG150		LC1FG185
Rated control circuit voltage (Uc)		50 or 60 Hz		V	48...440	
Control voltage limits (θ ≤ 55 °C)	40...400 Hz coils	Operation			0.85...1.1 Uc	
		Drop-out			0.20...0.55 Uc	
Average consumption at 20 °C and at Uc	~ 50 Hz	Inrush	40...400 Hz coil	VA	690...855	950...1180
			Cos φ		0.9	0.9
	Sealed	40...400 Hz coil	VA	6.6...8.1	8.9...10.9	
		Cos φ		0.9	0.9	
Heat dissipation				W	5.9...7.2	8...9.8
Operating time <sup>(1)</sup>		Closing "C"		ms	35	35
		Opening "O"		ms	130	130
Mechanical durability at Uc		In millions of operating cycles			10	10
Maximum operating rate at ambient temperature ≤ 55 °C		In operating cycles per hour			2400	2400
Cabling Min/max c.s.a.	Flexible cable without cable end	1 or 2 conductors	mm²	1/4	1/4	
		1 conductor	mm²	1/4	1/4	
			2 conductors	mm²	1/2.5	1/2.5
	Solid cable without cable end	1 or 2 conductors	mm²	1/4	1/4	
		Tightening torque				N.m

Characteristics of the locking electromagnet (shockproof device)						
Contactor type				LC1FG150		LC1FG185
Control circuit voltage 40...400 Hz			V	48...440		
Inrush consumption			VA	100	100	
Maximum energisation time at Uc			ms	20	20	
Maximum operating rate		In operating cycles per hour		2400	2400	
Mechanical durability at Uc		In millions of operating cycles		1 x 10 <sup>6</sup>	1 x 10 <sup>6</sup>	

<sup>(1)</sup> The closing time "C" is measured from the moment the coil supply is switched on to initial contact of the main poles.  
The opening time "O" is measured from the moment the coil supply is switched off to the moment the main poles separate.

Ref.



High power contactors



LC1FG265	LC1FG400	LC1FG500	LC1FG630
48...440	110...440	110...440	110...440
0.85...1.1 Uc	0.85...1.1 Uc	0.85...1.1 Uc	0.85...1.1 Uc
0.35...0.55 Uc	0.3...0.5 Uc	0.3...0.5 Uc	0.25...0.5 Uc
650	1075	1100	1650
0.9	0.9	0.9	0.9
10	15	18	22
0.9	0.9	0.9	0.9
8	14	18	20
40...65	40...75	40...75	40...80
100...170	100...170	100...170	100...200
10	10	10	10
2400	2400	2400	1200
1/4	1/4	1/4	1/4
1/4	1/4	1/4	1/4
1/2.5	1/2.5	1/2.5	1/2.5
1/4	1/4	1/4	1/4
1.2	1.2	1.2	1.2

LC1FG265	LC1FG400	LC1FG500	LC1FG630
48...440	110...440	110...440	110...440
100	100	100	100
20	20	20	20
2400	2400	2400	1200
1 x 10 <sup>6</sup>	1 x 10 <sup>6</sup>	1 x 10 <sup>6</sup>	1 x 10 <sup>6</sup>



TeSys

TeSys Contact blocks for TeSys FG contactors

Characteristics

Environment				
Contact block type			LADN	LADT and LADS
Conforming to standards			IEC 60947-5-1, EN 60947-5-1	
Product certifications			UL, CSA	
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact IP2X	
Ambient air temperature around the device	Storage	°C	-60...+80	
	Operation	°C	-5...+60	
	Permissible for operation at Uc	°C	-40...+70	
Maximum operating altitude	Without derating	m	3000	
Cabling	Phillips n° 2 and Ø6 mm. Flexible or solid cable with or without cable end	mm²	Min: 1 x 1; max: 2 x 2.5	

Ref.



High power  
contactors



# TeSys

## TeSys Contact blocks for TeSys FG contactors

### Characteristics

Instantaneous and time delay contact characteristics											
Contact block type				LADN		LADT and LADS			LADR		
Number of contacts					1 or 4		2			2	
Rated operational voltage Up to (Ue)				V	660						
Rated insulation voltage (Ui)		Conforming to IEC 60947-5-1		V	690						
		Conforming to UL, CSA		V	600						
Conventional thermal current (Ith)		For ambient temperature ≤ 60 °C		A	10						
Frequency of the operational current				Hz	25...400						
Minimum switching capacity		U min		V	17						
		I min		mA	5						
Short-circuit protection		Conforming to IEC 60947-5-1 and VDE 0660. gG fuse		A	10						
Rated making capacity		Conforming to IEC 60947-5-1, I rms		A	∼ 140; ∓ 250						
Short-time rating		Permissible for		1 s	A	100					
				500 ms	A	120					
				100 ms	A	140					
Insulation resistance				MΩ	> 10						
Non-overlap time		Guaranteed between N/C and N/O contacts		ms	1.5 (on energisation and on de-energisation)						
Time delay (LADT, R and S contact blocks) Accuracy only valid for setting range indicated on the front face		Ambient air temperature for operation		°C	–		-40...+70			-40...+70	
		Repeat accuracy			–		±2 %			±2 %	
		Drift up to 0.5 million operating cycles			–		+15 %			+15 %	
		Drift depending on ambient air temperature			–		0.25 % per °C			0.25 % per °C	
Mechanical durability		In millions of operating cycles			30		5			5	
Rated operational power of contacts Conforming to IEC 60947-5-1				V	24	48	110/127	220/230	380/400	440	600
		1 million operating cycles		VA	150	300	400	480	500	500	500
		3 million operating cycles		VA	80	170	250	290	320	320	320
		10 million operating cycles		VA	30	65	90	120	130	130	130
		Occasional making capacity		VA	1200	2600	7000	13 000	15 000	13 000	9000

Ref.

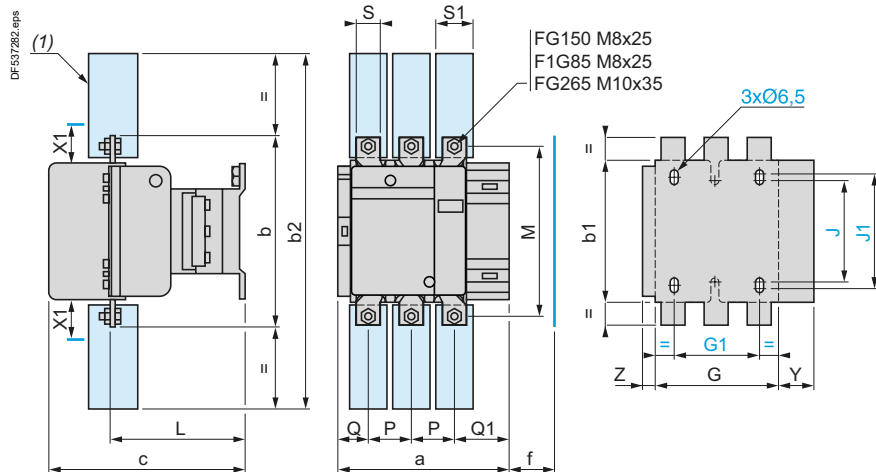


High power contactors



## Dimensions

### LC1FG150, FG185 and FG265



X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

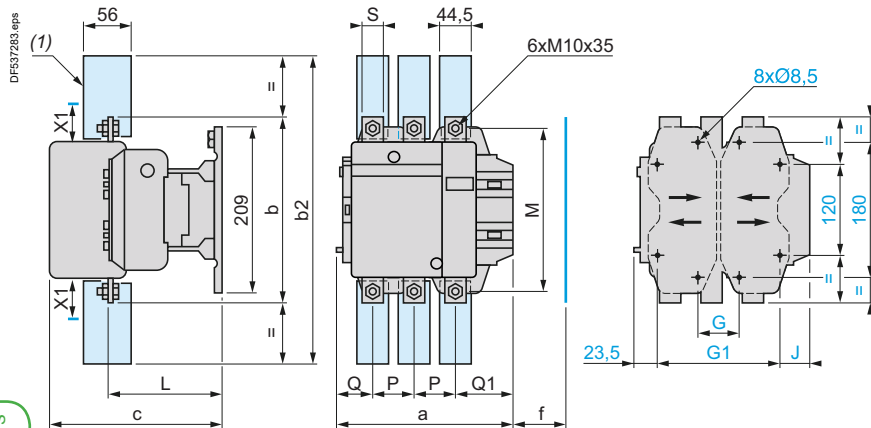
LC1	200...500 V	600...1000 V
FG150	10	15
FG185	10	15
FG265	10	15

(1) Power terminal protection shroud  
(see page B9/14).

LC1	a	b	b1	b2	c	f	G	G1	J	J1	L	M	P	Q	Q1	S	S1	Y	Z
FG150	181	170	137	301	180	131	106	80	106	120	116	150	40	26	57.5	20	34	44	13.5
FG185	183.5	174	137	305	190	130	111	80	106	120	122.5	154	40	29	59.5	20	34	44	13.5
FG265	217.5	203	145	375	222	147	142	96	106	120	150	178	48	39	66.5	25	44.5	38	21.5

f = minimum distance required for coil removal.

### LC1FG400 and FG500



X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

LC1	200...500 V	600...1000 V
FG400	15	20
FG500	15	20

(1) Power terminal protection shroud  
(see page B9/14).

LC1	a	b	b2	c	f	G	G min.	G max.	G1	G1 min.	G1 max.	J	L	M	P	Q	Q1	S
FG400	237	206	375	234	146	80	66	102	223	156	192	19.5	160	181	48	75	74	25
FG500	257	238	400	247	150	80	66	120	223	156	210	39.5	181	208	55	78	77	30

f = minimum distance required for coil removal.



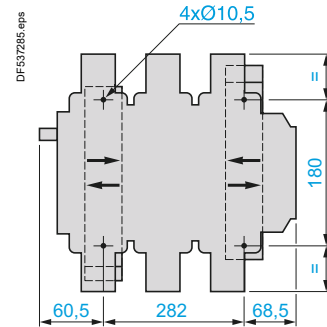
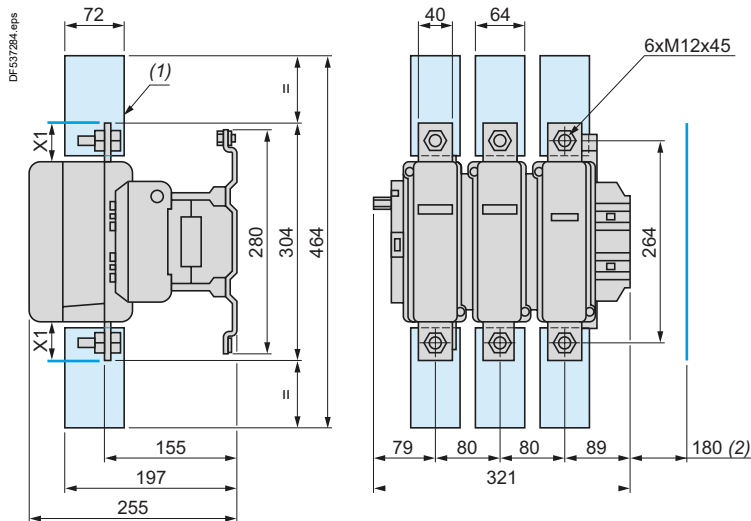
# TeSys

## TeSys FG Shockproof high power 3-pole contactors

### Dimensions and schemes

#### Dimensions

##### LC1FG630



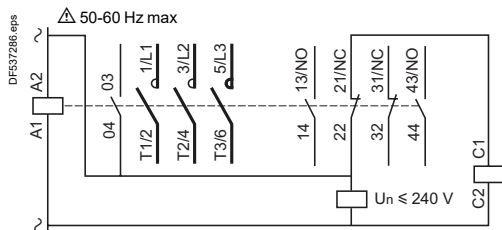
X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

LC1	200...500 V	690...1000 V
FG630	20	30

- (1) Power terminal protection shroud (see page B9/14).  
 (2) Minimum distance required for coil removal.

#### Schemes

##### Contactors LC1-FG150 to FG630



#### Add-on blocks

##### Instantaneous auxiliary contacts

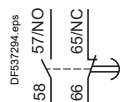


##### Time delay auxiliary contacts

##### On-delay 1 N/O + 1 N/C LADT●

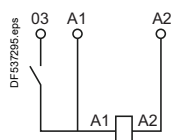


##### Off-delay 1 N/O + 1 N/C LADR●



#### Coils ~

##### LX1FH, FJ, FK and FL





# TeSys

## TeSys CR1F Magnetic latching high power contactors

### Characteristics



CR1F500

Ref.



High power  
contactors

### Magnetic latching contactors

Magnetic latching contactors of both block and bar mounted types are fitted with a special electromagnet which enables them to remain in the “On” position when the coil is no longer energised.

#### Applications

The special properties of magnetic latching contactors make them suitable for a large number of applications.

##### Properties

- Retention of the sequence memory in automatic control equipment in the event of loss of control voltage.
- Energy saving, since the source of supply to the coil does not need to supply current when the contactor is latched in the closed state.
- Change of state from “Closed” to “Open” by current signal through the coil.
- Unaffected by mains interference.
- Utilisation of contactors beyond their breaking capacity, as operations are performed off-load.
- Contactors are silent in the latched position.

##### Applications

- Refineries, power stations, excitation circuits.
  - Contactors remaining in the closed state for long periods.
- Examples: refineries, power supplies, low voltage distribution.
- Selective opening control.
  - No unwanted opening and closing of the main power poles.
  - Current carrying at voltages up to 1000 Volts.

### Operation of the electromagnet

#### CR1F block contactors

CR1F magnetic latching contactors are fitted with a double coil with 3 terminals comprising a latching winding and an unlatching winding. The 2 windings have a common point which can necessitate special wiring precautions when the latching supply is separate from the unlatching supply.

The power supplies may be a.c. or d.c. For d.c. operation, the polarities indicated must be complied with.

Operating precautions:

- the 2 windings must not be supplied simultaneously
- a winding must not be supplied continuously
- supply to the coils must be via pulsed contacts.

Manual opening:

if the control voltage is not present, the contactor can be unlatched manually.

Latching is obtained by direct supply of the coil in one direction of current flow.

Unlatching is obtained by a reverse current, adjusted by resistors.



TeSys CR1F selection - Squirrel cage motor Direct On Line starter																
Continuous or intermittent duty up to 30 operating cycles/hour																
Motor <sup>(1)</sup>												3-pole contactor	3-pole differential thermal overload relay		3 fuses Type	
220 V 230 V			380 V 400 V			415 V			440 V			<sup>(2)</sup>	Reference	Setting range	aM	BS-88
P	In		P	In		P	In		P	In		Reference		A	Rating	
kW	HP	A	kW	HP	A	kW	HP	A	kW	HP	A				A	A
25	35	85	—	—	—	—	—	—	—	—	—	CR1F150	LR9F5367	60...100	100	125
30	40	103	51	70	98	55	75	100	59	80	97	CR1F150	LR9F5369	90...150	100	160
33	45	113	55	75	105	—	—	—	—	—	—	—	—	—	—	—
—	—	—	59	80	112	59	80	105	63	85	109	CR1F150	LR9F5369	90...150	125	160
—	—	—	63	85	117	63	85	115	—	—	—	—	—	—	—	—
37	50	126	75	100	138	75	100	135	75	100	125	CR1F150	LR9F5369	90...150	160	200
40	54	134	—	—	—	—	—	—	80	110	131	—	—	—	—	—
45	60	150	80	110	147	80	110	138	90	125	146	CR1F185	LR9F5369	90...150	160	200
51	70	170	90	125	170	90	125	165	100	136	162	CR1F185	LR9F5371	132...220	200	250
55	75	182	—	—	—	100	136	182	—	—	—	—	—	—	—	—
59	80	195	100	138	188	110	150	200	110	150	178	CR1F265	LR9F5371	132...220	250	315
63	85	203	110	150	205	—	—	—	129	175	209	—	—	—	—	—
75	100	240	129	175	242	129	175	230	132	180	215	CR1F265	LR9F7375	200...330	250	315
—	—	—	132	180	245	132	180	240	—	—	—	—	—	—	—	—
—	—	—	—	—	—	140	190	250	140	190	227	CR1F265	LR9F7375	200...330	315	400
80	110	260	140	190	260	147	200	260	147	200	236	CR1F400	LR9F7375	200...330	315	400
—	—	—	147	200	273	150	205	270	150	205	246	—	—	—	—	—
—	—	—	150	205	280	160	220	280	160	220	256	—	—	—	—	—
90	125	295	160	220	300	—	—	—	180	245	289	CR1F400	LR9F7375	200...330	315	400
—	—	—	—	—	—	—	—	—	185	250	295	—	—	—	—	—
100	136	325	180	245	333	180	245	320	200	270	321	CR1F400	LR9F7379	300...500	400	500
110	150	356	185	250	342	185	250	325	220	300	353	—	—	—	—	—
—	—	—	200	270	370	200	270	340	250	340	401	CR1F400	LR9F7379	300...500	400	500
—	—	—	—	—	—	220	300	385	—	—	—	—	—	—	—	—
129	175	420	220	300	408	—	—	—	257	350	412	CR1F500	LR9F7379	300...500	500	630
132	180	425	250	340	460	250	340	425	280	380	450	CR1F500	LR9F7381	380...630	500	630
140	190	450	—	—	—	257	350	450	—	—	—	—	—	—	—	—
147	200	472	—	—	—	—	—	—	295	400	473	CR1F500	LR9F7381	380...630	500	630
—	—	—	257	350	475	280	380	475	300	410	481	CR1F630	LR9F7381	380...630	500	630
—	—	—	—	—	—	295	400	500	—	—	—	—	—	—	—	—
150	205	483	280	380	510	300	410	510	315	430	505	CR1F630	LR9F7381	380...630	630	800
160	220	520	295	400	546	315	430	535	335	450	518	—	—	—	—	—
180	245	578	300	410	565	335	450	550	355	480	549	CR1F630	LR9F7381	380...630	630	800
185	250	595	315	430	584	355	480	580	375	500	575	—	—	—	—	—
200	270	626	335	450	620	375	500	610	400	454	611	CR1F630	LR9F7381	380...630	800	1000
220	★	700	355	★	635	400	★	650	425	★	650	CR1BL33	—	500...800	800	1000
—	—	—	375	★	670	425	★	690	445	★	680	—	—	—	—	—
—	—	—	400	★	710	445	★	730	450	★	690	—	—	—	—	—
—	—	—	—	—	—	450	★	740	475	★	730	—	—	—	—	—
250	★	800	425	★	760	475	★	780	500	★	780	CR1BM33	—	500...800	800	1000
257	★	826	445	★	790	500	★	820	530	★	825	CR1BM33	—	630...1000	1000	1250
280	★	900	450	★	800	530	★	870	560	★	870	—	—	—	—	—
295	★	948	475	★	850	560	★	920	600	★	920	—	—	—	—	—
300	★	980	500	★	900	600	★	978	630	★	965	—	—	—	—	—
315	★	990	530	★	950	—	—	—	—	—	—	—	—	—	—	—

(1) The ratings are for standard 220/230 V, 380/400 V, 415 or 440 V motors. The overload relays should preferably be set to the motor full-load current shown on the motor rating plate. For other power ratings, select the overload relay with the appropriate range; the associated contactor and fuses must have ratings equal to or immediately greater than  $I_n$ .

(2) Reference to be completed, see page B9/79.

★ There are no standard power ratings for these motors.

Ref.



High power contactors



**Rated operational current in AC-3 ( $\theta \leq 55^\circ\text{C}$ )**

Contactor size		CR1F 150	CR1 F185	CR1F 265	CR1F 400	CR1 F500	CR1F 630	CR1 BL	CR1 BM	CR1 BP	CR1 BR
440 V	<b>A</b>	150	185	265	400	500	630	750	1000	1500	1800
500 V	<b>A</b>	135	175	245	385	500	540	750	900	1200	1500
660/690 V	<b>A</b>	130	140	230	365	435	470	700	800	900	1100
1000 V	<b>A</b>	47	73	95	135	270	330	400	400	500	600

**Rated operational power (standard motor power ratings)**

220...240 V	<b>kW</b>	40	55	75	110	147	200	220	280	425	500
	<b>HP</b>	54	75	100	150	200	270	300	380	580	680
380...400 V	<b>kW</b>	75	90	132	200	250	335	400	500	750	900
	<b>HP</b>	100	185	180	270	340	450	545	680	1000	1220
415 V	<b>kW</b>	80	100	140	220	280	375	425	530	800	900
	<b>HP</b>	110	136	180	300	380	500	580	720	1100	1220
440 V	<b>kW</b>	80	100	140	250	295	400	450	560	800	900
	<b>HP</b>	110	136	190	340	400	545	610	760	1100	1220
500 V	<b>kW</b>	90	110	160	257	355	400	500	600	750	900
	<b>HP</b>	125	150	220	350	480	545	680	810	1000	1220
660/690 V	<b>kW</b>	100	110	160	280	335	450	560	670	750	900
	<b>HP</b>	—	—	—	—	—	610	760	910	1000	1220
1000 V	<b>kW</b>	65	100	147	185	335	450	530	530	670	750
	<b>HP</b>	—	136	200	250	—	610	720	720	910	1000

Maximum operating rate in operating cycles/hour, at rated operational power with an on-load factor = 85 %: 750 for CR1F150 to F265, 500 for CR1F400 to F630 and 120 for CR1 B.

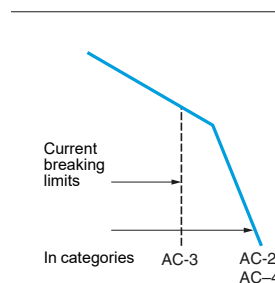
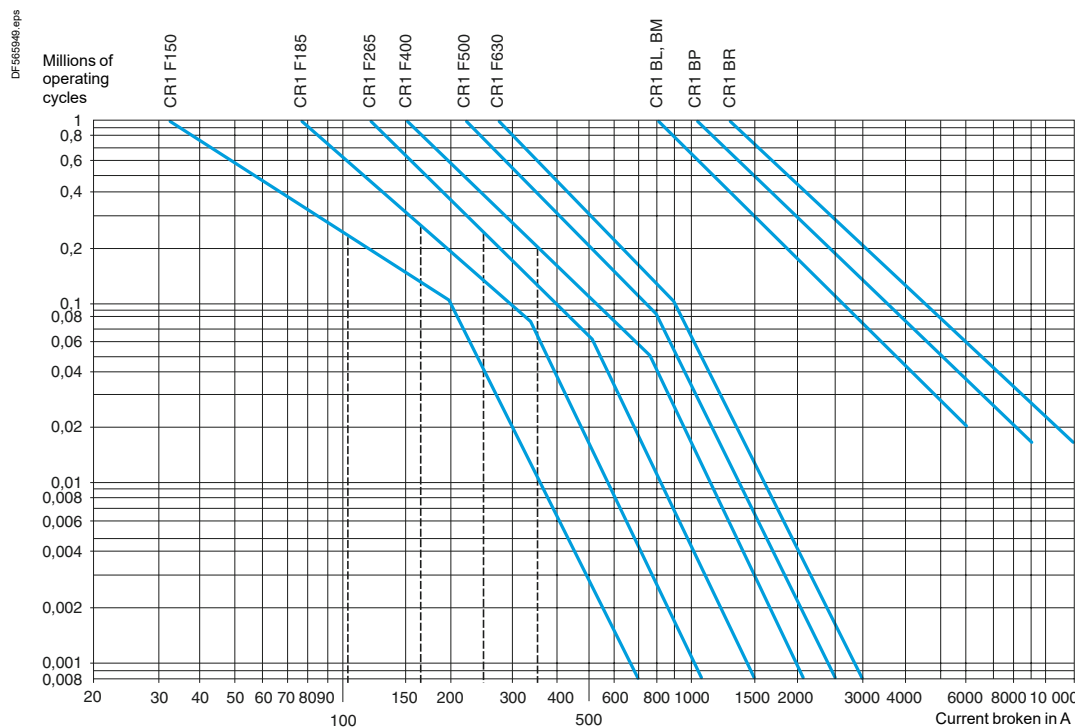
Ref.





**Use in category AC-3** ( $U_e \leq 440 \text{ V}$ ) <sup>(1)</sup> ( $\theta \leq 55^\circ \text{C}$ )

The current ( $I_c$ ) in AC-3 is equal to the rated operational current ( $I_e$ ) drawn by the motor.



#### Example:

Asynchronous motor with  $P = 50 \text{ kW}$ ,  $U_e = 380 \text{ V}$ ,  $I_e = 100 \text{ A}$ ,  $I_c = I_e = 100 \text{ A}$ , or asynchronous motor with  $P = 55 \text{ kW}$ ,  $U_e = 415 \text{ V}$ ,  $I_e = 100 \text{ A}$ ,  $I_c = I_e = 100 \text{ A}$ . 600000 operating cycles required.

The above selection curves show the contactor rating needed, CR1F185.

<sup>(1)</sup> For 660 V, multiply the number of operating cycles by 0.8.

Ref.



High power contactors



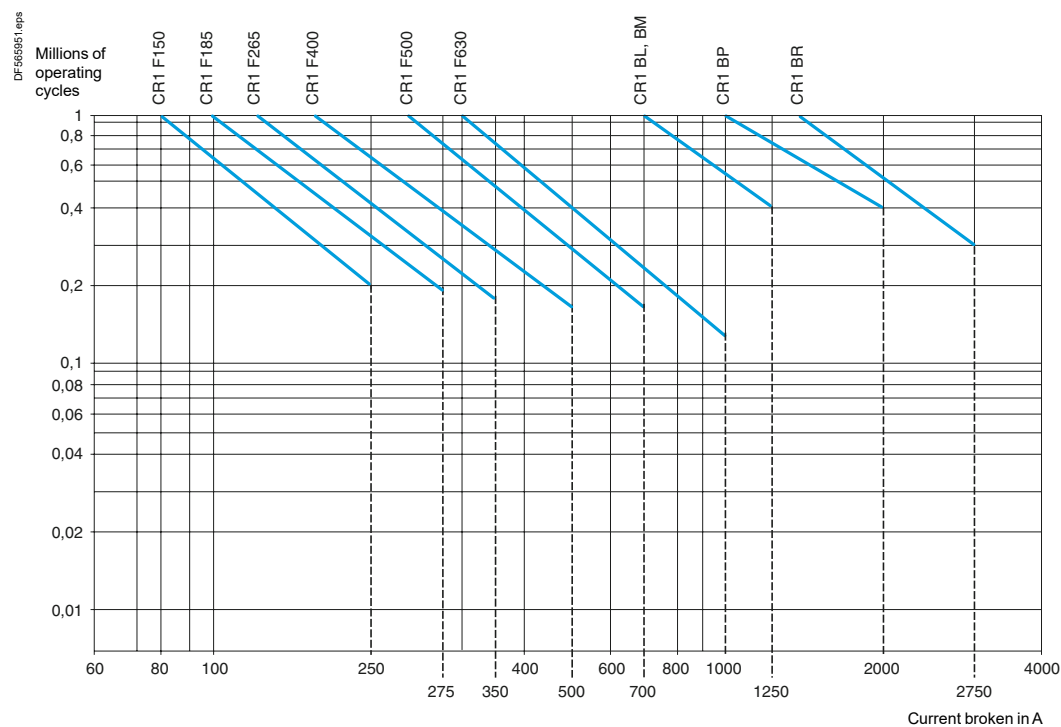
**Maximum operational current (on-load factor  $\geq 0.95$ )****Maximum operating rate: 120 operating cycles/hour**

Contactor size		CR1 F150	CR1 F185	CR1 F265	CR1 F400	CR1 F500	CR1 F630	CR1 BL	CR1 BM	CR1 BP	CR1 BR	
Cable c.s.a.	mm <sup>2</sup>	120	150	185	—	—	—	—	—	—	—	
Number of bars		—	—	—	2	2	2	2	2	3	4	
Bar c.s.a.	mm	—	—	—	30 x 5	40 x 5	60 x 5	50 x 5	80 x 5	100 x 5	100 x 5	
Operational current in category AC-1 at ambient temperature	≤ 40 °C	A	250	275	350	500	700	1000	800	1250	2000	2750
	≤ 55 °C	A	250	275	300	430	580	850	700	1100	1750	2400
	≤ 70 °C	A	170	180	250	340	500	700	600	900	1500	2000

**Increase in operational current by parallel connection of poles**

Apply the following coefficients to the above currents; these coefficients take into account an often unbalanced distribution of current between the poles:

- 2 poles in parallel:  $K = 1.6$
- 3 poles in parallel:  $K = 2.25$
- 4 poles in parallel:  $K = 2.8$

**Electrical durability ( $U_e \leq 440\text{ V}$ ) <sup>(1)</sup>****Example:**

$U_e = 220\text{ V}$  -  $I_e = 200\text{ A}$  -  $\theta = 40\text{ °C}$  -  $I_c = I_e = 200\text{ A}$

600000 operating cycles required.

The above selection curves show the contactor rating needed, CR1F400.

<sup>(1)</sup> For 660 V, multiply the number of operating cycles by 0.8.



### 3-phase transformer primaries switching

#### Operating conditions

Maximum ambient temperature: 55 °C.

Maximum operational voltage: 1000 V, 50...60 Hz.

When a transformer is switched on, there is generally an initial current surge which reaches its peak value almost instantaneously and then decreases in a largely exponential manner to quickly reach its steady state value.

The value of this current depends on:

- the characteristics of the magnetic circuit and of the windings (cross sectional area of the core, rated inductance, number of turns, size of the windings, ...)
- the performance of the magnetic laminations used (residual induction and saturation inductance),
- the magnetic state of the circuit and the instantaneous value of the a.c. mains voltage at the moment of switch-on.

The peak current at the moment of switch-on can reach 20 to 40 times the rated current for the various kVA power ratings in the tables below. This value is independent of the "no-load" or "on-load" state of the transformer.

The peak magnetising current of the transformer must be lower than the values given in the tables below.

Contactor selection											
Maximum operating rate: 120 operating cycles/hour											
Contactor size		CR1 F150	CR1 F185	CR1 F265	CR1 F400	CR1 F500	CR1 F630	CR1 BL	CR1 BM	CR1 BP	CR1 BR
Maximum permissible current peak at switch-on	<b>A</b>	1700	2800	3500	5500	6800	9000	18 000	18 000	24 000	30 000
Maximum operational power <sup>(1)</sup>	220...230 V	<b>kVA</b>	25	40	50	75	100	140	230	230	380
	380...400 V	<b>kVA</b>	50	75	90	130	170	225	400	400	530
	415...440 V	<b>kVA</b>	55	80	100	140	190	250	450	450	560
	500 V	<b>kVA</b>	65	95	110	170	225	280	480	480	600
	660 V	<b>kVA</b>	80	120	140	200	270	315	600	600	800
	1000 V	<b>kVA</b>	100	150	200	250	375	470	700	700	1000

<sup>(1)</sup> Maximum operational power corresponding to a current peak at switch-on of 30 In.

Ref.



High power  
contactors



Environment					
Contactor type			CR1F150	CR1F185	CR1F265
Rated insulation voltage (Ui)	Conforming to IEC 60158-1, BS 775, 60947-4	V	1000	1000	1000
Ambient air temperature around the device	Storage	°C	-60...+80		
	For operation at Uc	°C	-15...+70		
Maximum operating altitude	Without derating	m	3000		
Operating positions	Without derating		±5 ° in relation to normal vertical mounting plane		
Pole characteristics					
Number of poles			3 or 4	3 or 4	3 or 4
Rated operational current (Ie) (Ue ≤ 440 V)	In AC-3, θ ≤ 40 °C	A	150	185	265
	In AC-1, θ ≤ 40 °C	A	250	275	350
	In AC-4, θ ≤ 40 °C	A	138	170	245
Rated operational voltage (Ue)	Up to	V	1000	1000	1000
Frequency limits (sine wave)	Of the opoertional current	Hz	25...200	25...200	25...200
Rated making capacity	I rms	A	1700	2100	2940
Rated breaking capacity	I rms				
	220...440 V	A	1500	1800	2450
	500 V	A	1200	1600	2200
	660/690 V	A	1100	1200	1700
	1000 V	A	450	600	800
Permissible short time rating from cold state, with no current flowing for previous 60 minutes at θ ≤ 40 °C	For 1 s	A	1200	1500	2200
	For 5 s	A	1200	1500	2200
	For 10 s	A	1200	1500	2200
	For 30 s	A	700	920	1230
	For 1 min	A	600	740	950
	For 3 min	A	450	500	620
	For 10 min	A	350	400	480
Short-circuit protection by fuses θ ≤ 440 V	Motor circuit AC-3 (type aM)	A	160	200	315
	AC-1 circuit (type gG, BS 88)	A	250	315	400
Average impedance per pole	At Ith and 50 Hz	mΩ	0.45	0.36	0.32
Power dissipated per pole for the above operational currents	AC-3	W	6	12	22
	AC-1	W	18	26	39
Connection	Number of conductors		1	1	1
	Cable with lugs	mm²	120	150	240
	Cable with connector	mm²	120	150	240
	Number of bars		2	2	2
	Bar c.s.a.	mm	25 x 3	25 x 3	32 x 4
	Bolt diameter		Ø8	Ø8	Ø10
	Tightening torque	N.m	18	18	35

Ref.

High power  
contactors



## Characteristics

CR1F400	CR1F500	CR1F630	CR1BL	CR1BM	CR1BP	CR1BR
1000	1000	1000	1000	1000	1000	1000
-60...+80			-60...+80			
-15...+70			-15...+60			
3000			3000			
±5 ° in relation to normal vertical mounting plane			±5 ° in relation to normal vertical mounting plane			
3 or 4	3 or 4	3 or 4	1, 2, 3 or 4	1, 2, 3 or 4	1, 2, 3 or 4	1, 2, 3 or 4
400	500	630	750	1000	1500	1800
500	700	1000	800	1250	2000	2750
370	460	560	700	800	1250	1500
1000	1000	1000	1000	1000	1000	1000
25...200	25...200	25...200	50...60	50...60	50...60	50...60
4500	5000	6740	10 000	10 000	15 000	18 000
4000	5000	6300	10 000	10 000	15 000	18 000
3500	4500	5400	9000	9000	12 000	15 000
3000	3560	4600	8000	8000	9000	11 000
1200	2500	3200	4000	4000	5000	6000
3600	4200	5050	9600	9600	12 000	15 000
3600	4200	5050	9600	9600	12 000	15 000
3600	4200	5050	7000	8000	9600	12 000
2400	3200	4400	4800	5200	6400	8000
1700	2400	3400	3500	3800	5200	6300
1200	1500	2200	2100	2400	3600	4400
1000	1200	1600	1200	1800	2800	3600
400	500	630	800	1200	800 x 2 <sup>(1)</sup>	1000 x 2 <sup>(1)</sup>
500	800	1000	800	1200	1000 x 2 <sup>(1)</sup>	1200 x 2 <sup>(1)</sup>
0.28	0.18	0.12	0.18	0.18	0.13	0.09
45	45	48	88	180	290	360
70	88	120	115	280	520	680
2	2	–	–	–	–	–
150	240	–	–	–	–	–
–	–	–	–	–	–	–
2	2	2	2	2	3	4
30 x 5	40 x 5	60 x 5	50 x 5	80 x 5	100 x 5	100 x 10
Ø10	Ø10	Ø12	4 x Ø8	4 x Ø10	4 x Ø10	4 x Ø10
35	35	58	21	35	35	35

<sup>(1)</sup> Paralleling of poles must be carried out only in accordance with the fuse manufacturer's recommendations.



a.c. and d.c. control circuit characteristics						
Contactor type			CR1F150	CR1F185	CR1F265	
Rated control circuit voltage (Uc)	~ 50 or 60 Hz	V	48...415			
	~ 400 Hz	V	48...220			
	---	V	48...220			
	--- low consumption	V	48...220			
Control voltage limits ~ and ---	Latching		0.85...1.1 Uc			
	Unlatching		0.85...1.1 Uc			
Maximum operating rate at ambient temperature ≤ 40 °C	In operating cycles per hour		120			
Mechanical durability	In millions of operating cycles		1			
Average consumption 50/60 Hz	Latching	1-pole	VA	—	—	—
		2-pole	VA	—	—	—
		3-pole	VA	1100	1600	1650
		4-pole	VA	100	1600	1650
	Unlatching	1-pole	VA	—	—	—
		2-pole	VA	—	—	—
		3-pole	VA	7.3	8	9
		4-pole	VA	7.3	8	9
	400 Hz and ---	1-pole	VA	—	—	—
		2-pole	VA	—	—	—
		3-pole	VA	1260	1750	1800
		4-pole	VA	1260	1750	1800
	Unlatching	1-pole	VA	—	—	—
		2-pole	VA	—	—	—
		3-pole	VA	10	11	12
		4-pole	VA	10	11	12
--- low consumption	Latching	3/4-pole	W	500	500	500
	Unlatching	3/4-pole	W	15	20	40
Average operating time at Uc <sup>(1)</sup>	Latching		ms	35...40	35...40	45...50
	Unlatching		ms	50...100	50...100	50...100

(1) The closing time is measured from the moment the closing coil is energised to initial contact of the main poles. The opening time is measured from the moment the opening coil is energised to the moment the main poles separate.

**Note:** the arcing time depends on the circuit switched by the main poles. For 3-phase applications the arcing time is usually less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.

Auxiliary contact characteristics														
Type of contacts				LADN for contactors CR1F										
Conventional thermal current			A	10										
Rated insulation voltage (Ui)	Conforming to IEC 60947-5-1		V	690										
Connection	Flexible or solid conductor with or without cable end		mm²	1 x 1 min; 2 x 2.5 max										
Operational power of contacts LADN for contactors CR1F			a.c. supply						d.c. supply					
			Electrical durability (valid for up to 3600 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current (cos φ 0.7) = 10 times the power broken (cos φ 0.4).						Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.					
			V	48	115	230	400	600	V	48	125	250	440	
1 million operating cycles			VA	120	280	560	960	1440	W	90	75	68	61	
Occasional making capacity			VA	2600	7000	13 000	15 000	9000	W	700	400	260	220	



CR1F400	CR1F500	CR1F630	CR1BL	CR1BM	CR1BP	CR1BR
48...415			110...500			
48...220			110...500			
48...220			110...500			
48...220			—			
0.85...1.1 Uc			0.85...1.1 Uc			
0.85...1.1 Uc			0.85...1.1 Uc			
120			120			
1			1			
—	—	—	650	650	650	650
—	—	—	1100	1100	1100	1100
1450	1650	2100	1650	1650	1650	1650
1450	1650	2100	1850	1850	1850	1850
—	—	—	110	110	110	110
—	—	—	125	125	125	125
12	9.5	8	165	165	165	165
12	9.5	8	175	175	175	175
—	—	—	600	600	600	600
—	—	—	1000	1000	1000	1000
1600	1800	2300	1500	1500	1500	1500
1600	1800	2300	1700	1700	1700	1700
—	—	—	100	100	100	100
—	—	—	115	115	115	115
16	13	11	150	150	150	150
16	13	11	160	160	160	160
500	550	620	—	—	—	—
70	60	45	—	—	—	—
40...75	40...80	40...80	100...150	100...150	100...150	100...150
50...100	50...100	50...100	20...40	20...40	20...40	20...40

(1) The closing time is measured from the moment the closing coil is energised to initial contact of the main poles. The opening time is measured from the moment the opening coil is energised to the moment the main poles separate.

**Note:** the arcing time depends on the circuit switched by the main poles. For 3-phase applications the arcing time is usually less than 10 ms. The load is isolated from the supply after a time equal to the sum of the opening time and the arcing time.

LADN for contactors CR1F	ZC4GM for contactors CR1B
10	20
690	660
1 x 1 min; 2 x 2.5 max	2 min; 4 max
Operational power of contacts ZC4GM for contactors CR1 B	<b>a.c. supply</b> Electrical durability (valid for up to 2400 operating cycles/hour) on an inductive load such as the coil of an electromagnet: making current ( $\cos \varphi 0.7$ ) = 10 times the power broken ( $\cos \varphi 0.4$ ).
1 million operating cycles	<b>d.c. supply</b> Electrical durability (valid for up to 1200 operating cycles/hour) on an inductive load such as the coil of an electromagnet, without economy resistor, the time constant increasing with the load.
Occasional making capacity	

V	110 127	220	380	415 440	500
VA	2000	4000	4000	4000	3500
VA	14000	23000	35000	45000	35000

V	110	120	440	500
W	250	250	230	200
W	1600	800	400	360

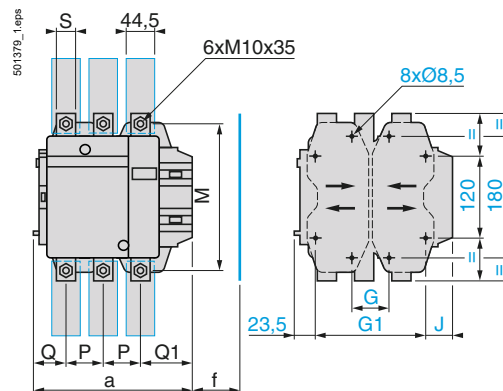
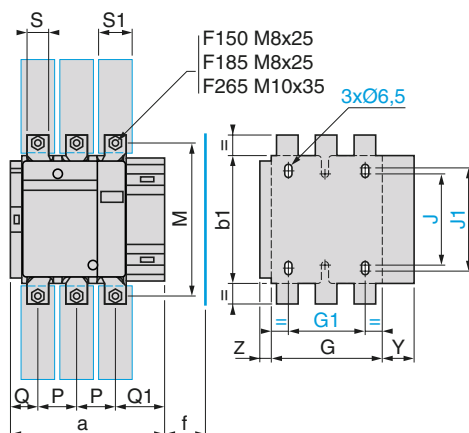
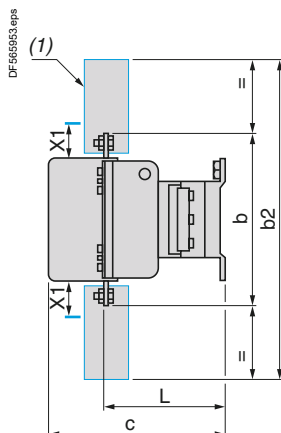


## CR1F150 to F500

Common side view

CR1F150, F185, F265

CR1F400, F500



CR1	F150		F185		F265	
	3P	4P	3P	4P	3P	4P
a	163.5	201.5	168.5	208.5	201.5	244.5
b	170	170	174	174	203	203
b1	137	137	137	137	145	145
b2	301	301	305	305	370	370
c	171	171	181	181	213	213
f	131	131	130	130	147	147
G	106	143	111	151	142	190
G1	80	80	80	80	96	96
J	106	106	106	106	106	106
J1	120	120	120	120	120	120
L	107	107	113.5	113.5	141	141
M	150	150	154	154	178	178
P	40	40	40	40	48	48
Q	26	26	29	29	39	34
Q1	57.5	55.5	59.5	59.5	66.5	66.5
S	20	20	20	20	25	25
S1	27	27	34	34	38	38
Y	44	44	38.5	30.5	30.5	21.5
Z	13.5	13.5	13.5	13.5	15.5	15.5

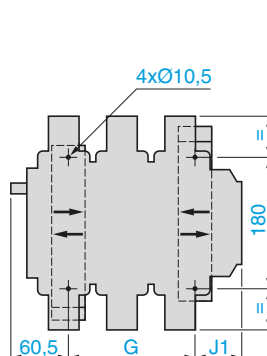
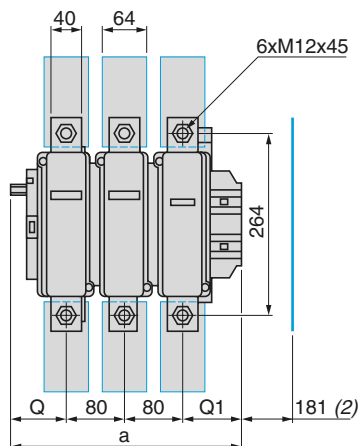
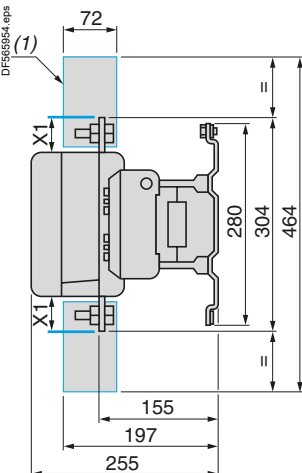
f = minimum distance required for coil removal.

X1: Minimum electrical clearance according to operational voltage and breaking capacity.

Voltage in V	200...500	660...1000
CR1F150	10	15
CR1F185	10	15
CR1F265	10	15

(1) Power terminal protection shroud (see page B9/14).

## CR1F630



CR1F630	3P	4P
a	309	389
G supplied	180	240
G min.	100	150
G max.	195	275
J1	61	81
Q	60	60
Q1	89	89

X1: Min. electrical clearance according to operational voltage and breaking capacity.

Voltage in V	X1
200...500	20
690...1000	30

(1) Power terminal protection shroud.  
(2) Minimum distance required for coil removal.



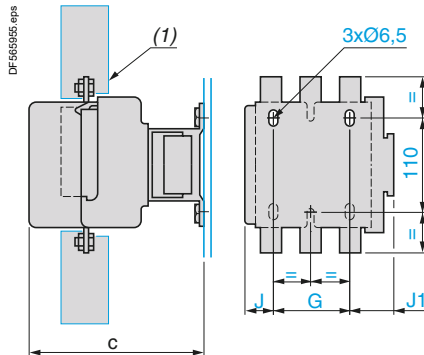
# TeSys

## TeSys CR1F Magnetic latching high power contactors

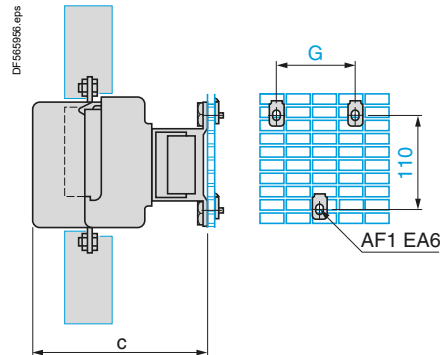
### Mounting

#### CR1F150...F265

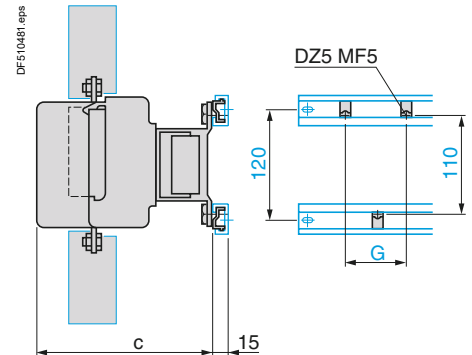
Panel mounted



On pre-slotted mounting plate AM1PA, PB, PC



On rails DZ5MB on 120 mm centres



	CR1	F150	F185	F265
c	3P	171	181	213
	4P	171	181	213
G	3P	80	80	96
	4P	80	80	96
J	3P	26.5	29	44.5
	4P	45	49	68.5
J1	3P	57	59.5	61.5
	4P	75.5	79.5	85.5

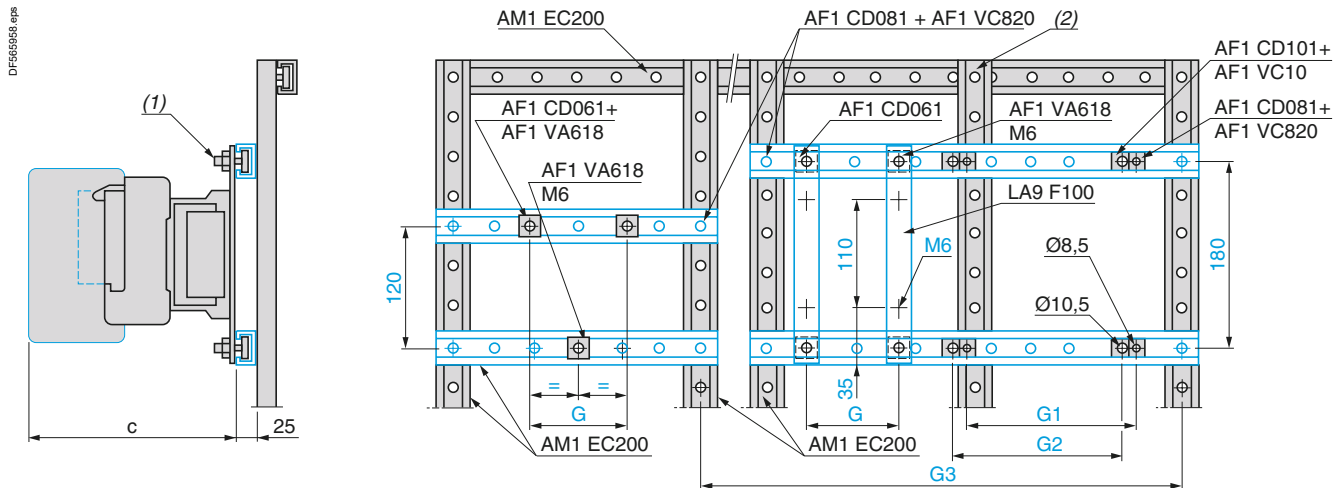
	CR1	F150	F185	F265
c	3P	171	181	213
	4P	171	181	213
G	3P	80	80	96
	4P	80	80	96

	CR1	F150	F185	F265
c	3P	171	181	213
	4P	171	181	213
G	3P	80	80	96
	4P	80	80	96

(1) Power terminal protection shroud (see page B9/14).

#### CR1F150...F650

On 2 notched uprights AM1EC●●●



	CR1	F150	F185	F265	F400	F500	F630
c	3P	171	181	213	213	226	250
	4P	171	181	213	213	226	250
G (M6)	3P	80	80	96	—	—	—
	4P	80	80	96	—	—	—
G1 (Ø8,5)	3P	—	—	—	80	80	—
	4P	—	—	—	80	140	—
G2 (Ø10,5)	3P	—	—	—	—	—	180
	4P	—	—	—	—	—	240

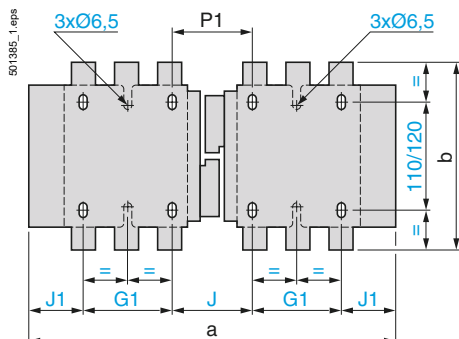
(1) AF1CD●●● or AF1VA●●●.

(2) This AM1EC200 upright is required when G2 or G3 is greater than 700 mm (please consult your Regional Sales Office).

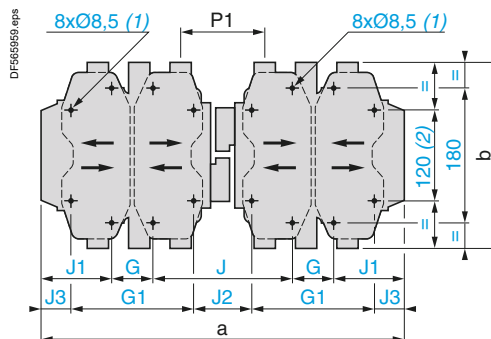


#### Reversing contactors 2 x CR1F150...F265

Horizontally mounted



#### Reversing contactors 2 x CR1F400...F630



2 x CR1		F150	F185	F265
a	3P	345	357	425
	4P	422	437	521
b	3P	170	174	203
	4P	170	174	203
G1	3P	80	80	96
	4P	80	80	96
J	3P	71	78	109
	4P	111	118	157
J1	3P	57	59.5	61.5
	4P	75.5	79.5	85.5
P1	3P	71	78	100
	4P	71	78	100

2 x CR1		F400	F500	F630
a	3P	446	485	636
	4P	542	595	796
b	3P	206	238	304
	4P	206	238	304
G	3P	80	80	180
	4P	80	140	240
G1	3P	170	170	—
	4P	170	230	—
J	3P	157	156	139
	4P	157	156	139
J1	3P	64.5	84.5	68.5
	4P	112.5	79.5	68.5
J2	3P	67	66	—
	4P	67	66	—
J3	3P	19.5	39.5	—
	4P	67.5	34.5	—
P1	3P	107	112	137
	4P	107	112	137

(1) Except F630: 4 x Ø 10.5.

(2) Except F630: 180.

Ref.



High power  
contactors



# TeSys

## TeSys CR1F Magnetic latching reversing contactors

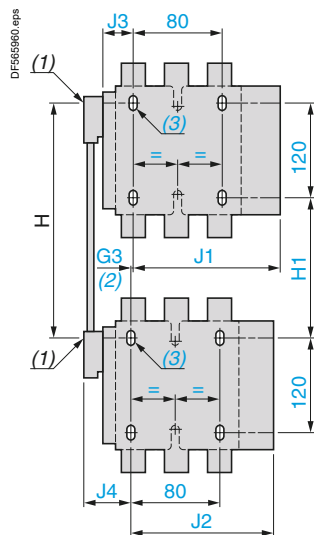
### Mounting

#### Reversing contactors

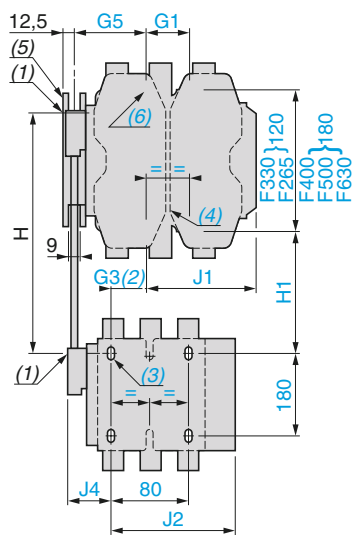
Vertically mounted with mechanical interlock **LA9F**...

2 contactors **CR1F** of identical or different ratings (CR1F150...F630), see pages B9/81 and B9/81.

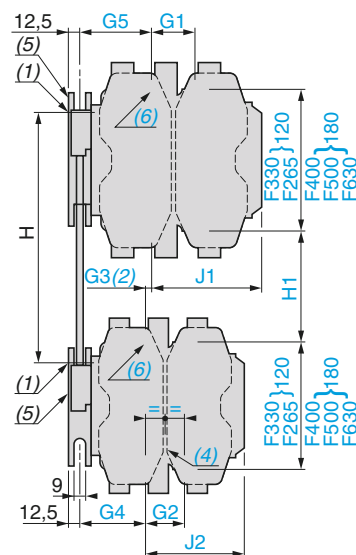
Assembly A



Assembly B



Assembly C



(1) Mechanical interlock shaft.

(2) For assembly of contactors of different ratings only.

(3) 3 x Ø6.5 mm for CR1F150...F265.

(4) 3 x Ø6.5 mm for CR1F265.

(5) Mechanical interlock guide bracket.

(6) 4 x Ø8.5 mm for CR1F400, F500 or 4 x Ø10.5 mm.

Assembly type LA9F		A			B								C									
		F4F	G4F	G4G	H4F	J4F	K4F	L4F	H4G	J4G	K4G	L4G	H4H	J4H	K4H	L4H	J4J	K4J	L4J	K4K	L4K	L4L
G1	3P	—	—	—	96	80	80	180	96	80	80	180	96	80	80	180	80	80	180	80	180	180
	4P	—	—	—	96	80	140	240	96	80	140	240	96	80	140	240	80	140	240	140	240	240
G2	3P	—	—	—	—	—	—	—	—	—	—	—	96	96	96	96	80	80	80	80	80	180
	4P	—	—	—	—	—	—	—	—	—	—	—	96	96	96	96	80	80	80	140	140	240
G3	3P	0	3	0	21	45	45	35	19	42	42	33	0	23	23	14	0	0	9 <sup>(7)</sup>	0	9 <sup>(7)</sup>	0
	4P	0	4	0	27	26	26	17	23	22	22	13	0	0	0	9 <sup>(7)</sup>	0	0	9 <sup>(7)</sup>	0	9 <sup>(7)</sup>	0
G4	3P	—	—	—	—	—	—	—	—	—	—	—	60	60	60	60	83	83	83	83	83	74
	4P	—	—	—	—	—	—	—	—	—	—	—	83	83	83	83	83	83	83	83	83	74
G5	3P	—	—	—	60	83	83	74	60	83	83	74	60	83	83	74	83	83	74	83	74	74
	4P	—	—	—	83	83	83	74	83	83	83	74	83	83	83	74	83	83	74	83	74	74
H	min.	200	210	220	240	250	270	310	250	250	270	310	250	260	280	330	260	280	325	300	345	380
	max.	310	300	310	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380	380
H1	min.	80	90	100	110	80	100	140	120	90	110	150	130	110	130	170	60	100	140	120	160	200
	max.	190	180	190	250	210	210	210	250	220	220	220	260	230	230	220	200	200	195	200	195	200
J1	3P	133	134	134	149.5	137	157	241	149.5	137	157	241	149.5	137	157	24	137	157	241	157	244	241
	4P	145	146	146	164.5	185	212	321	164.5	185	212	321	164.5	185	212	321	185	212	321	212	321	321
J2	3P	133	133	134	183	133	183	133	134	134	134	134	142.5	149.5	149.5	149.5	137	137	137	157	157	241
	4P	145	145	146	145	145	145	145	146	146	146	146	164.5	164.5	164.5	164.5	185	185	185	212	212	312
J3	3P	48.5	53	53	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4P	67	73	73	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
J4	3P	48.5	54	53	48.5	48.5	48.5	48.5	53	53	53	53	—	—	—	—	—	—	—	—	—	—
	4P	67	69	73	67	67	67	67	73	73	73	73	—	—	—	—	—	—	—	—	—	—

(7) In this case, G4 is greater than G5.



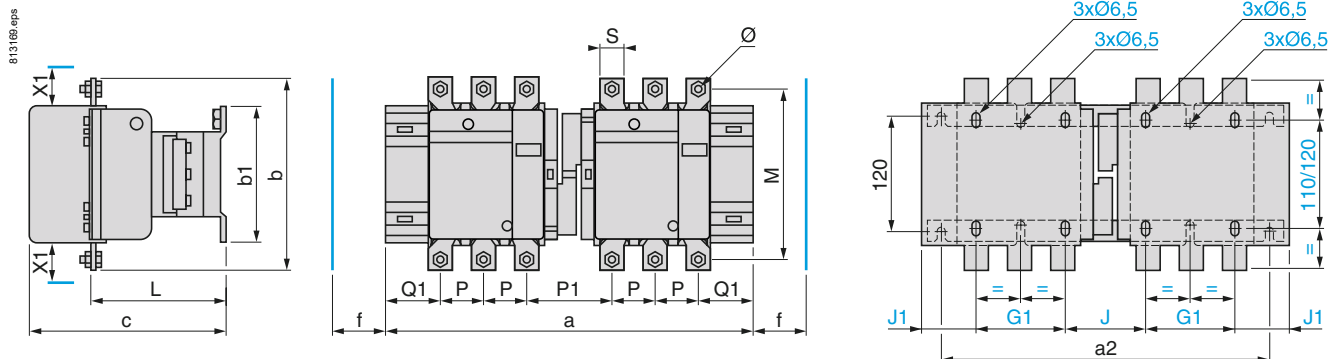
# TeSys

## TeSys F - Reversing and changeover contactors

### Dimensions

#### Pre-assembled

LC2F115 to F265 (reverser supplied on 2 bars which can be used for fixing the device)



f - Minimum distance required for coil removal.

X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

LC1	200...500 V	660...1000 V
F115, F150	10	15
F185	10	15
F225, F265	10	15

Bar fixing centres  
Vertical: 120 mm  
Horizontal: a2 see table

Ref.



LC2		a	a2	b	b1	c	G1	J	J1	L	M	P	P1	Q1	S	f	Ø
F115	3P	345	317	162	137	171	80	71	57	107	147	37	77	60	20	131	M6
	4P	419	378	162	137	171	80	108	75.5	107	147	37	77	60	20	131	M6
F150	3P	345	317	170	137	171	80	71	57	107	150	40	71	57	20	131	M8
	4P	422	381	170	137	171	80	111	75.5	107	150	40	71	55.5	20	131	M8
F185	3P	357	326	174	137	181	80	78	59.5	113.5	154	40	78	59.5	20	130	M8
	4P	437	390	174	137	181	80	118	79.5	113.5	154	40	78	59.5	20	130	M8
F225	3P	357	326	197	137	181	80	78	59.5	113.5	172	48	62	51.5	25	130	M10
	4P	437	390	197	137	181	80	118	79.5	113.5	172	48	54	47.5	25	130	M10
F265	3P	425	386	203	145	213	96	109	61.5	141	178	48	100	66.5	25	147	M10
	4P	521	464	203	145	213	96	157	85.5	141	178	48	100	66.5	25	147	M10

High power  
contactors



# TeSys

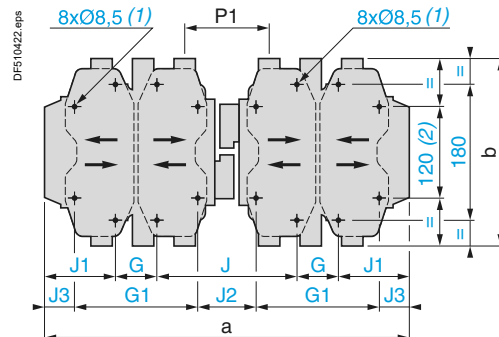
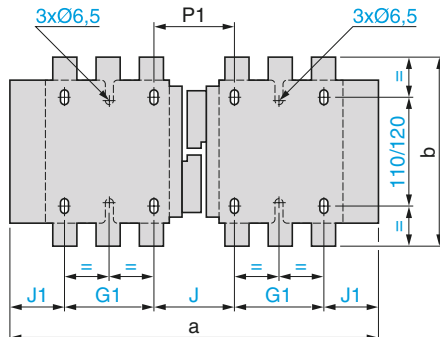
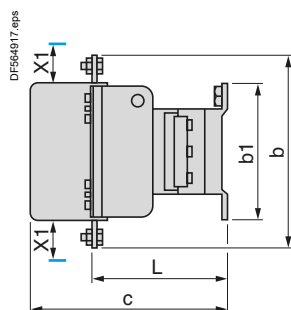
## TeSys F - Reversing and changeover contactors

### Dimensions

For customer assembly, fixing recommended on AM1EC uprights, please consult your Regional Sales Office.

2 x LC1F115 to F330

2 x LC1F400, F500, F630, F800



X1 (mm) = Minimum electrical clearance according to operating voltage and breaking capacity.

LC1	200...500 V	660...1000 V	200...690 V	1000 V
F115, F150	10	15	—	—
F185	10	15	—	—
F225, F265	10	15	—	—
F330	10	15	—	—
F400	15	20	—	—
F500	15	20	—	—
F630	20	30	—	—
F800	—	—	10	20

2 x LC1		a	b	b1	c	G	G1	J	J1	J2	J3	L	P1
F115	3P	345	162	137	171	—	80	71	57	—	—	107	77
	4P	419	162	137	171	—	80	108	75.5	—	—	107	77
F150	3P	345	170	137	171	—	80	71	57	—	—	107	71
	4P	422	170	137	171	—	80	111	75.5	—	—	107	71
F185	3P	357	174	137	181	—	80	78	59.5	—	—	113.5	78
	4P	437	174	137	181	—	80	118	79.5	—	—	113.5	78
F225	3P	357	197	137	181	—	80	78	59.5	—	—	113.5	62
	4P	437	197	137	181	—	80	118	79.5	—	—	113.5	54
F265	3P	425	203	145	213	—	96	109	61.5	—	—	141	100
	4P	521	203	145	213	—	96	157	85.5	—	—	141	100
F330	3P	447	206	145	219	—	96	124	65.5	—	—	145	107
	4P	543	206	145	219	—	96	172	89.5	—	—	145	107
F400	3P	446	206	209	219	80	170	157	64.5	67	19.5	145	107
	4P	542	206	209	219	80	170	157	112.5	67	67.5	145	107
F500	3P	485	238	209	232	80	170	156	84.5	66	39.5	146	112
	4P	595	238	209	232	140	230	156	79.5	66	34.5	146	112
F630	3P	636	304	280	255	180	—	139	68.5	—	—	155	137
	4P	796	304	280	255	240	—	139	88.5	—	—	155	137
F800	3P	636	304	280	255	180	—	139	68.5	—	—	155	137

(1) Except LC1F630 and F800: 4 x Ø10.5.

(2) Except LC1F630 and F800.

For other dimensions: see pages B9/54 and B9/55.

COORD.

Ref.



High power  
contactors



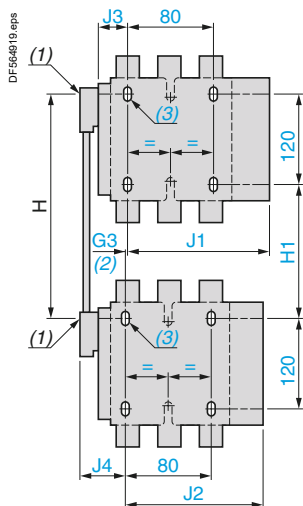
# TeSys

## TeSys F - Reversing and changeover contactors

### Dimensions

For customer assembly, with mechanical interlock (MI) **LA9F**, fixing recommended on AM1EC uprights (please consult your Regional Sales Office). 2 x **LC1** identical or different ratings (**LC1F115 to F630 and F800**). See pages B9/34 to B9/37.

#### Assembly A



(1) Mechanical interlock shaft.

(2) For assembly of contactors of different ratings only.

(3) 4 x Ø6.5 for LC1F115 to F225.

#### Assembly A <sup>(7)</sup> - Mechanical interlock reference

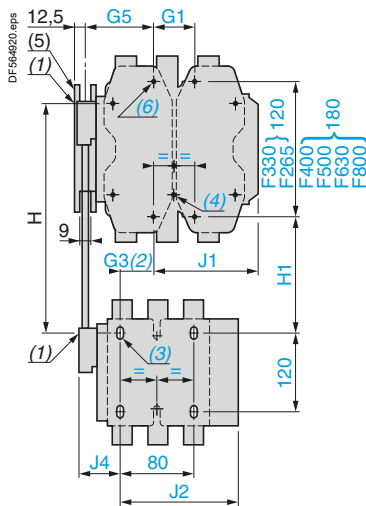
	G3 3P	G3 4P	H min.	H max.	H1 min.	H1 max.	J1 3P	J1 4P
LA9FF4F	0	0	200	310	80	190	137	155.5
LA9FG4F	3	4	210	300	90	180	139.5	159.5
LA9FG4G	0	0	220	310	100	190	139.5	159.5

	J2 3P	J2 4P	J3 3P	J3 4P	J4 3P	J4 4P
LA9FF4F	137	155.5	48.5	67	48.5	67
LA9FG4F	137	155.5	53	73	54	69
LA9FG4G	139.5	159.5	53	73	53	73

For customer assembly, fixing recommended on AM1EC uprights, please consult your Regional Sales Office.  
2 x **LC1F780**

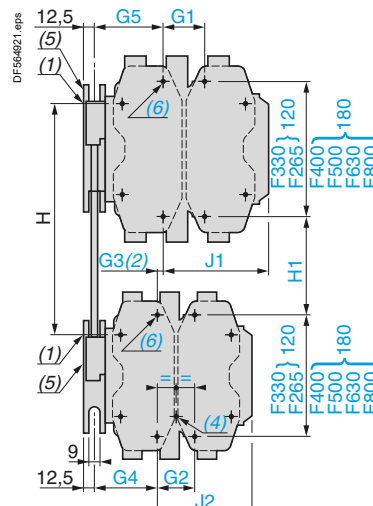
#### Assembly B



(4) 4 x Ø6.5 for LC1F265.

(5) Mechanical interlock guide bracket.

#### Assembly C



(6) 4 x Ø8.5 for LC1F400, F500 or 4 x Ø10.5 for LC1F630 and F800.

#### Assembly B <sup>(7)</sup> - Mechanical interlock reference

	G1 3P	G1 4P	G3 3P	G3 4P	G5 3P	G5 4P	H min.	H max.
LA9FH4F	96	96	21	27	60	83	240	380
LA9FJ4F	80	80	45	26	83	83	250	380
LA9FK4F	80	140	45	26	83	83	270	380
LA9FL4F	180	240	35	17	74	74	310	380
LA9FH4G	96	96	19	23	60	83	250	380
LA9FJ4G	80	80	42	22	83	83	250	380
LA9FK4G	80	140	42	22	83	83	270	380
LA9FL4G	180	240	33	13	74	74	310	380

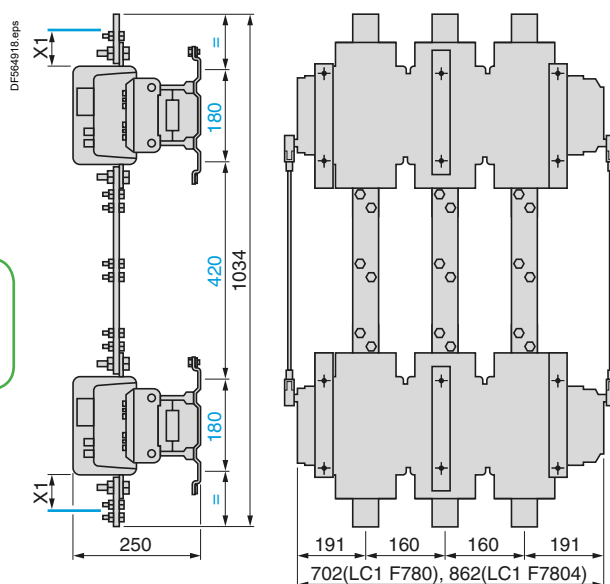
	H1 min.	H1 max.	J1 3P	J1 4P	J2 3P	J2 4P	J4 3P	J4 4P
LA9FH4F	110	250	157.5	181.5	137	155.5	48.5	67
LA9FJ4F	80	210	144.5	192.5	137	155.5	48.5	67
LA9FK4F	100	210	164.5	219.5	137	155.5	48.5	67
LA9FL4F	140	210	248.5	328.5	137	155.5	48.5	67
LA9FH4G	120	250	157.5	181.5	139.5	159.5	53	73
LA9FJ4G	90	220	144.5	192.5	139.5	159.5	53	73
LA9FK4G	110	220	164.5	219.5	139.5	159.5	53	73
LA9FL4G	150	220	248.5	328.5	139.5	159.5	53	73

#### Assembly C <sup>(7)</sup>

	G1 3P	G1 4P	G2 3P	G2 4P	G3 3P	G3 4P	G4 3P	G4 4P	G5 3P	G5 4P
LA9FH4H	96	96	96	96	0	0	60	83	60	83
LA9FJ4H	80	80	96	96	23	0	60	83	83	83
LA9FK4H	80	140	96	96	23	0	60	83	83	83
LA9FL4H	180	240	96	96	14	9 <sup>(8)</sup>	60	83	74	74
LA9FJ4J	80	80	80	80	0	0	83	83	83	83
LA9FK4J	80	140	80	80	0	0	83	83	83	83
LA9FL4J	180	240	80	80	9 <sup>(8)</sup>	9 <sup>(8)</sup>	83	83	74	74
LA9FK4K	80	140	80	140	0	0	83	83	83	83
LA9FL4K	180	240	80	140	9 <sup>(8)</sup>	9 <sup>(8)</sup>	83	83	74	74
LA9FL4L	180	240	180	240	0	0	74	74	74	74

	H min.	H max.	H1 min.	H1 max.	J1 3P	J1 4P	J2 3P	J2 4P
LA9FH4H	250	380	130	260	157.5	181.5	157.5	181.5
LA9FJ4H	260	380	110	230	144.5	192.5	157.5	181.5
LA9FK4H	280	380	130	230	164.5	219.5	157.5	181.5
LA9FL4H	330	380	170	220	248.5	328.5	157.5	181.5
LA9FJ4J	260	380	60	200	144.5	192.5	144.5	192.5
LA9FK4J	280	380	100	200	164.5	219.5	144.5	192.5
LA9FL4J	325	380	140	195	248.5	329.5	144.5	192.5
LA9FK4K	300	380	120	200	164.5	329.5	164.5	219.5
LA9FL4K	345	380	160	195	248.5	328.5	164.5	219.5
LA9FL4L	380	380	200	200	248.5	328.5	248.5	328.5



High power contactors

X1 and fixings, see page B9/86.

(7) Only 3P for F800.

(8) In this case, G4 is greater than G5.

Coordination tables:  
pages A6/34 to A6/59

References:  
pages B9/34 to B9/39

Schemes:  
pages B9/106 and B9/107



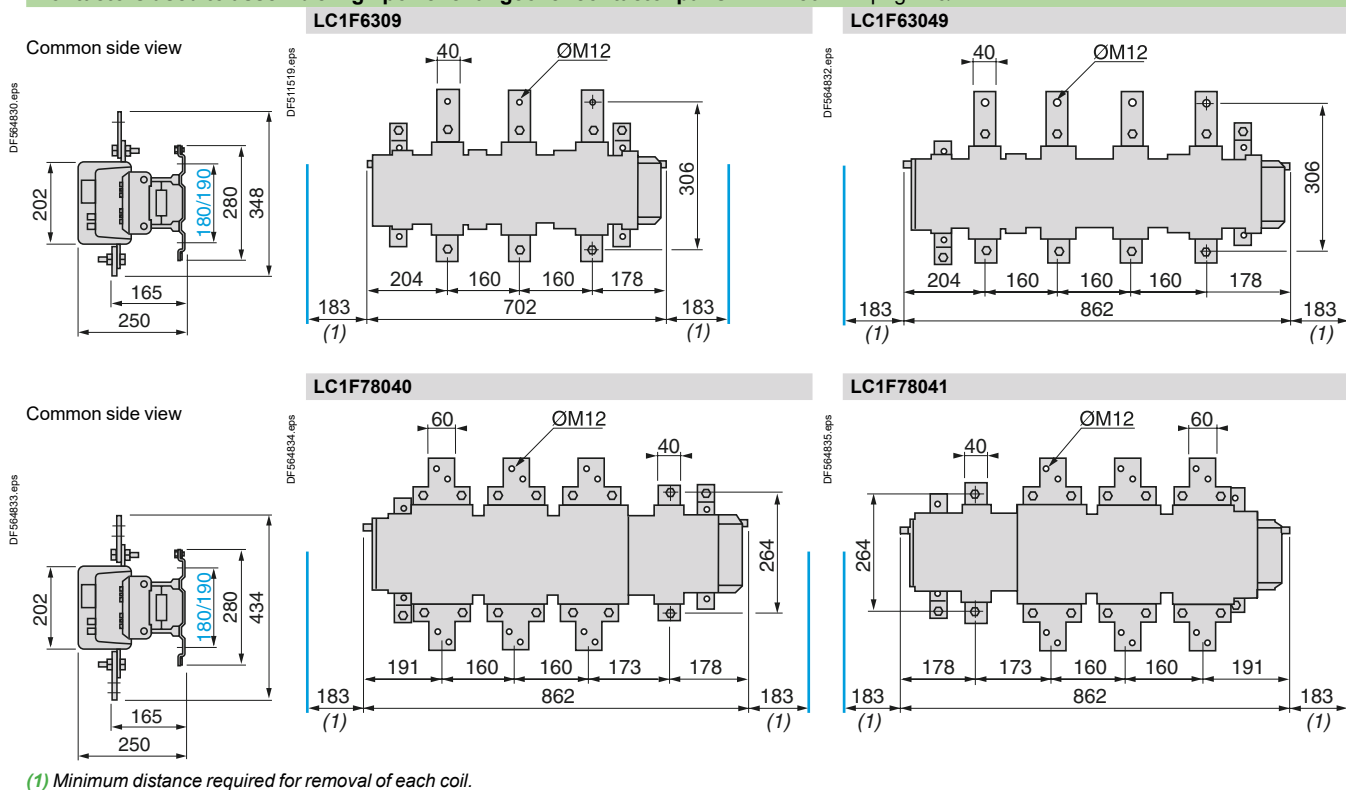
# TeSys

## TeSys F - Reversing and changeover contactors

### Dimensions

#### Dimensions

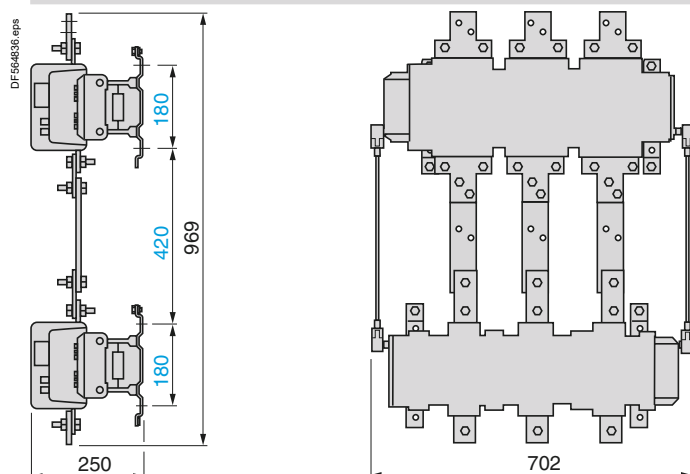
Contactors used to assemble high power changeover contactor pairs LC1F780: see page B9/41



#### 3-phase changeover contactor pairs

LC1F780 + LC1F780 + LA9FX970: see page B9/41

LC1F780 + LC1F6309 + LA9FX970





# TeSys

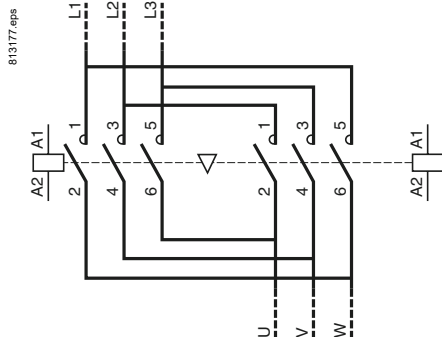
## TeSys F - Reversing and changeover contactors

### Schemes

#### Reversing contactors for motor control LC2F

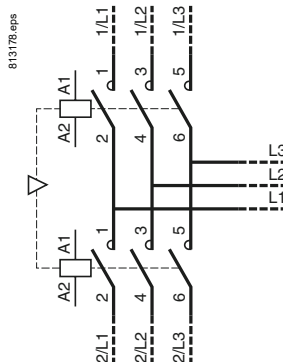
2 x LC1F

Horizontally mounted



2 x LC1F

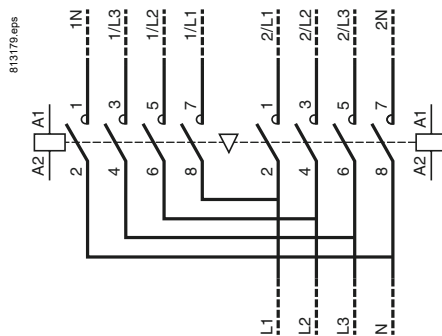
Vertically mounted



#### Changeover contactor pairs for distribution LC2F

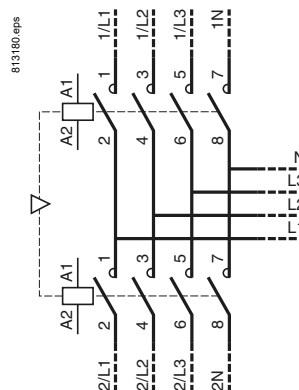
2 x LC1F

Horizontally mounted



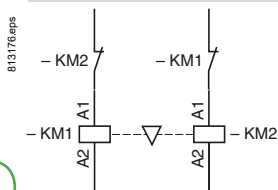
2 x LC1F

Vertically mounted



#### Electrical interlocking of reversers fitted with mechanical interlock without integral electrical contacts

LA9F



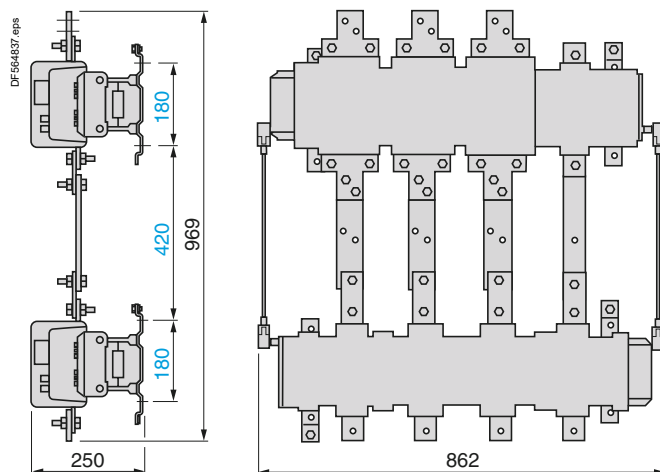
High power  
contactors



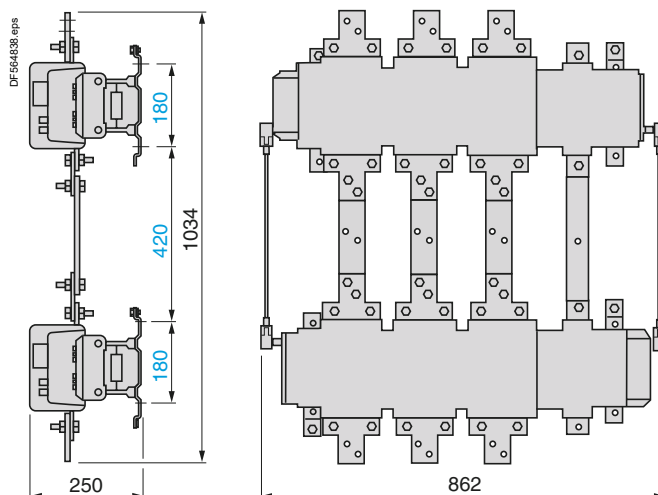
#### Dimensions

##### 3-phase + neutral changeover contactor pairs

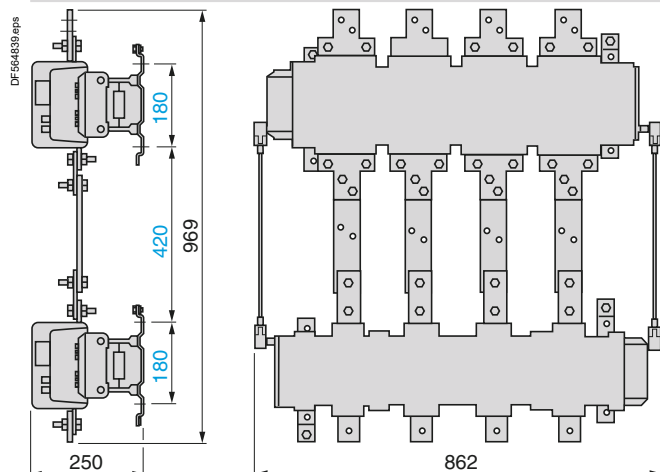
LC1F78041 + LC1F63049 + LA9FX970



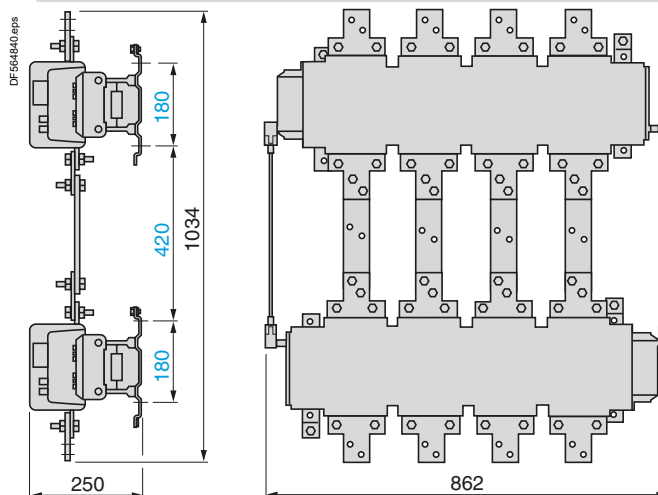
LC1F78041 + LC1F78040 + LA9FX970



LC1F7804 + LC1F63049 + LA9FX971



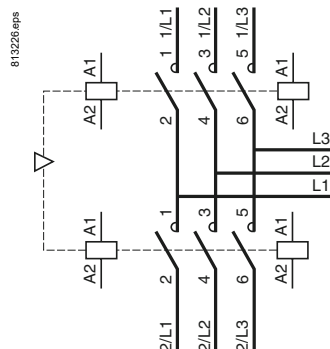
LC1F7804 + LC1F7804 + LA9FX971



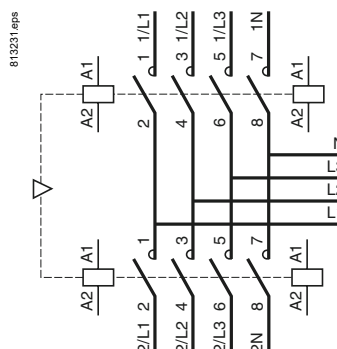
Ref.

#### Schemes

##### 3-phase changeover contactor pairs



##### 3-phase + neutral changeover contactor pairs



High power  
contactors





High power  
contactors






### Introduction

Applications	B10/2
Offer panorama	B10/4
Technology	B10/6

### TeSys B Bar mounted contactors - Variable composition (composition is defined by customer)

Type of product	Range		Pages
CV1B - Standard performance - 690 V	From 80 to 700 A - AC-3 From 80 to 1000 A - AC-1		B10/10
CV3B - LC1B - High performance - 1000 V	From 80 to 1800 A - AC-3 From 80 to 2750 A - AC-1		B10/20
Variable composition contactors - ordering process			B10/29

### TeSys B Bar mounted contactors - Predefined composition

LC1B - High performance / power - 1000 V	From 750 to 1800 A - AC-3 From 800 to 2750 A - AC-1		B10/32
CRXB, CVXB, CWXB - For control of DC excitation circuit of synchronous motors - 1200 V DC	From 80 to 2750 A - DC		B10/35
CR1B - Magnetic latching - 1000 V	From 750 to 1800 A - AC-3 From 800 to 2750 A - AC-1		B10/40

### Variable composition contactors – TeSys B

All details and composition list in the  
**TeSys B Bar mounted contactors dedicated catalogue**



Catalogue ref:  
DIA1ED2070702EN

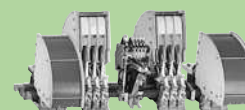
[Click here to download](#)

Bar  
mounted  
contactors

### TeSys B Bar mounted contactors - from specification of customer's application

Excitation circuit of synchronous motor,  
magnetic latching, furnaces and induction heating applications, tramways rails grounding...  
CF452 - Customer requirements specification form

From 80 to 16300 A - AC-1



B10/43



## Variable composition contactors: other solution

The use of a variable composition contactor becomes evident when the specification of the application can no longer be met with a standard contactor.

- High power load: > 400 kW.
- AC main supply from 1000 to 3000 V.
- Very inductive DC load: L/R > 15 ms.
- DC main supply with low current but voltage over 1000 V.
- High operating frequency: up to 1200 op./h.
- High durability: several millions of operations.

## Some examples

The fact sheets are available at <http://www.se.com/>



Application form ref. EDCED110013EN



Application form ref. EDCED110014EN



Application form ref. EDCED110017EN



Application form ref. EDCED110018EN

## Videos

### Very high power contactors - TeSys B - 1 - Discovery

Discover Schneider Electric's TeSys B bar contactors that are designed to cut out considerable electric arcs. See how they are manufactured in the Schneider Electric factory and check out the presentation of the range.



### Very high power contactors - TeSys B - 2 - Applications

Discover very high-power applications for which Schneider Electric's TeSys B bar contactors offer great advantages.







Application form ref. EDCED110015EN



Application form ref. EDCED110016EN



Application form ref. EDCED110019EN



Application form ref. EDCED110020EN

Very high power contactors - **TeSys B - 3 - Technology**  
Discover how Schneider Electric's TeSys B bar contactors cut out electric arcs of up to several thousand Amps: 'magnetic blowing'.





TeSys

TeSys B Bar mounted contactors

Offer panorama

Applications

- Motor switching in categories AC-3.
- Resistive load switching: heating, lighting.
- Distribution circuit switching: line contactor.
- Supply changeover switching: circuit coupling.
- Transformer, capacitor.

PB110888.eps



PB110869.eps



Contactors	Type
	Size

Rated operational current	AC-3
	AC-4/DC-5
	AC-1

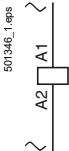
Max. rated operational voltage
--------------------------------

Available with configuration type command
---

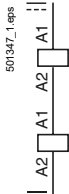
CV1B						
F	G <sup>(1)</sup>	H	J <sup>(1)</sup>	K (with Type 1 pole)	K (with Type 3 poles)	L <sup>(1)</sup>
80 A		250 A		460 A	460 A	
72 A/-		205 A/-		-/- A	380 / 630 A	
80 A		300 A		630 A	630 A	
690 V ~		690 V ~		690 V ~	1 000 V ~	
A - B - C - D						

Available control circuit configuration

Type A  
a.c. supply ~



Type B  
d.c. supply ---



(1) CV1B legacy size 'G', 'J', 'L', CV3B legacy size 'G', 'J', 'K', please consult us.

Bar  
mounted  
contactors



# TeSys

## TeSys B Bar mounted contactors

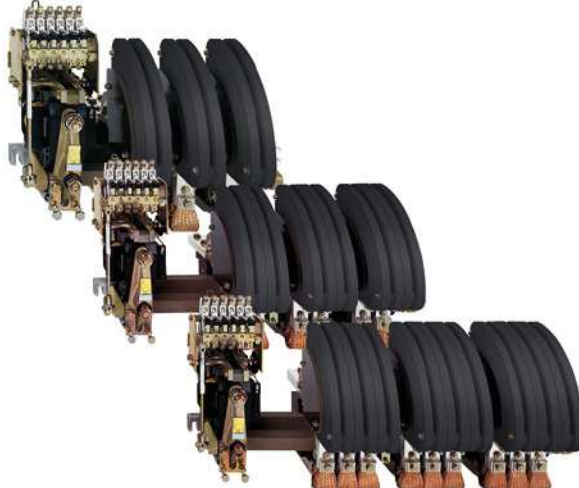
### Offer panorama

- Motor switching in categories AC-4, DC-5.
- Inductive circuit switching: crane electromagnets.
- High voltage d.c. switching: railway locomotives.
- Load switching at high operating rates.

PB121215.eps



PB121216.eps

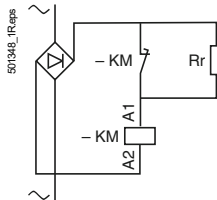


CV3B				
F	G <sup>(1)</sup>	H	J <sup>(1)</sup>	K <sup>(1)</sup>
80 A		250 A		
80/80 A		208/300 A		
80 A		300 A		
1000 V ~		1000 V ~		
A - B - C - D				

CV3B and LC1B			
L	M	P	R
800 A	1000 A	1500 A	1800 A
720/800 A	830/1000 A	1200/1800 A	1500/2500 A
800 A	1250 A	2000 A	2750 A
1000 V ~	1000 V ~	1000 V ~	1000 V ~
C - D (B: special conditions - contact us)			

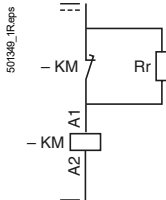
#### Type C

a.c. supply via economy resistor



#### Type D

d.c. supply via economy resistor



Bar  
mounted  
contactors



The variable composition contactor range is split into 3 groups:

■ **Low power switching contactors:**

- type CV1B●, 80 to 630 A
- type CV3B●, 80 to 300 A.

For motor control, the references of the CV1 and CV3 contactors are given on catalogue DIA2070702EN.

For other applications, the composition of the commercial references is described on Symbol combination table, see pages B10/29 to B10/31 or use the configuration software "bar contactor soft-customer.xls" to download on: [www.se.com](http://www.se.com).

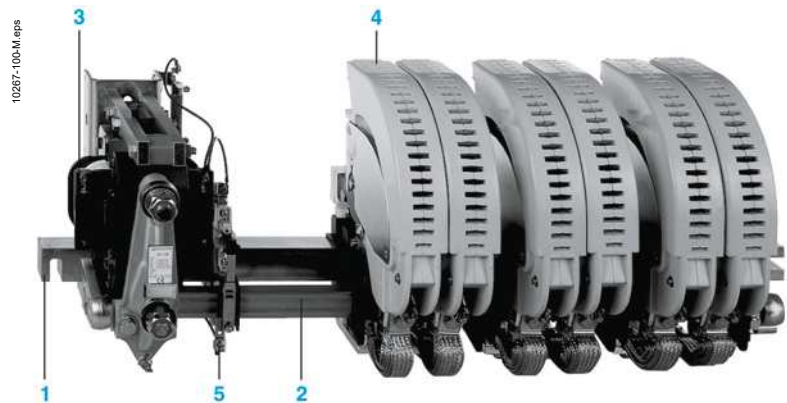
■ **Increased power switching contactors:**

- type LC1B●, 800 to 2750 A. References shown on B10/32 and B10/33.

■ **Specific contactors** (large number of main poles, pole arrangement, customised fixing and dimensions, component referencing, etc.):

- type CV1●B, 80 to 630 A
- type CV3●B, 80 to 2750 A.

To order these contactors, complete the Order form on catalogue DIA2070702EN.



- 1 Mounting bar
- 2 Rotating armature shaft
- 3 Electromagnet
- 4 Main pole
- 5 Instantaneous auxiliary contacts

Variable composition contactors are particularly suited for switching a.c. or d.c. motors and other circuits and are capable of providing a high number of operating cycles.

Their variable composition design allows them to be built to customer specification.

## Applications

These variable composition contactors are ideally suited for the most frequently encountered applications:

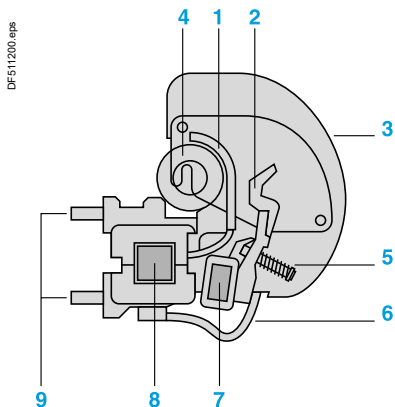
- Switching a.c. squirrel cage and slip-ring motors in all utilisation categories (AC-2, AC-3, AC-4).
  - Switching d.c. motors in all utilisation categories (DC-2, DC-3, DC-4, DC-5).
  - Switching a.c. resistive loads (category AC-1) and d.c. resistive loads (category DC-1).
  - Switching distribution circuits (category AC-1).
  - Short-circuiting of rotor resistors.
  - Switching capacitors, power factor correction.
  - Switching transformer primaries.
  - Switching inductive circuits with high time constant ( $L/R > 15 \text{ ms}$ )
- Example: alternator excitation circuit.
- Severe duty requirements and main pole arrangements comprising 1 to 6 N/O and/or N/C poles.



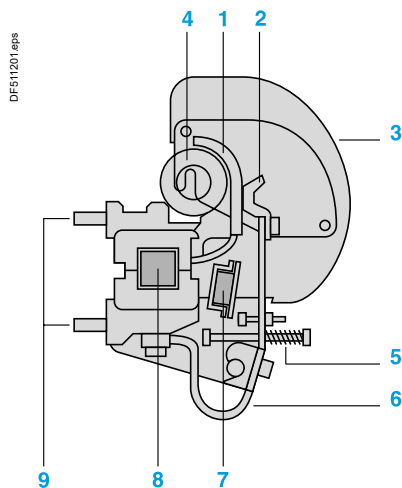
# TeSys

## TeSys B Bar mounted contactors

### Technology



N/O pole 80...2750 A.



N/C pole 80...1000 A.

- 1 Fixed contact
- 2 Moving contact
- 3 Arc chamber
- 4 Blow-out coil
- 5 Pole pressure spring
- 6 Braided conductor
- 7 Rotating armature shaft (moving contact actuator)
- 8 Mounting bar
- 9 Terminal lugs

#### Power circuit

The principal function of a main pole is to make and break the supply current. It is designed to continuously carry its nominal operational current.

#### Making the current

On energisation of the electromagnet coil, the armature shaft rotates and the moving contact makes with the fixed contact. The contact pressure, maintained by the pole pressure spring, is sufficient to overcome the electrodynamic forces of transient current peaks (e.g.: switching a transformer, starting a motor, etc.).

#### Breaking the current

On de-energisation of the electromagnet coil, the contacts separate and electrical arcing is dissipated by the blow-out coil and arc chamber. To optimise the performance of the magnetic blow-out, the blow-out coil can be selected to suit the operational current, which is particularly important when switching d.c. The N/C pole operates in a reverse manner to the N/O pole, i.e. the contacts are closed whilst the electromagnet coil is de-energised and open during energisation.

#### CV1 contactors

##### ■ 690 V ~, 220 V --- / pole

- N/O poles 80...1000 A (PN1)
- N/C poles 80...1000 A (PR1).

##### ■ Variants:

- no-load breaking poles
  - N/O poles 80...1000 A (PN5)
  - N/C poles 80...1000 A (PR5).
- arc chambers with splitters for dispersing the electric arc: 1000 V ~ / 440 V --- per pole
  - N/O poles 630...1000 A (PN3)
  - N/C poles 630...1000 A (PR3).

#### CV3 contactors

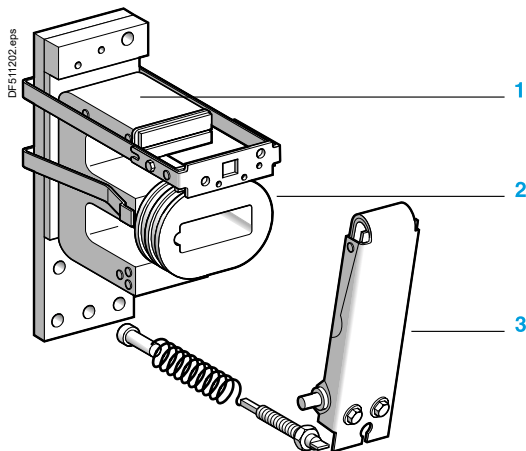
##### ■ 1000 V ~, 440 V --- / pole

- N/O poles 0...300 A (PA3)
- N/C poles 80...300 A (PR3)
- N/O poles 750...2750 A (PA1).

##### ■ Variants:

- high making capacity poles 750...2750 A (PA2)
- high breaking capacity poles and poles with reduced safety clearances (arc chambers with closed splitters) 750...2750 A (PA1PX8)
- no-load breaking poles
  - N/O poles 750...2750 A (PA5).





#### Electromagnet EB1

- 1 Electromagnet core
- 2 Coil
- 3 Electromagnet armature

### Control circuit

- 2 types of electromagnet: E shaped core and U shaped core.
- 2 types of coil: type WB1 and type WB2.

#### Electromagnet with E shaped core and coil type WB1

- **Electromagnet with E shaped laminated iron core, type EB**
    - with central air gap machined in armature,
    - with single coil type **WB1** fitted on centre limb of core.
- The upper limb incorporates a shading ring, the armature rotates.

#### ■ Coil - direct a.c. 50 or 60 Hz supply

- 20 to 600 V
- 1200 operations/hour.

At the moment of inrush, with the armature open, the coil impedance is low and power consumption is high.

In the sealed state the armature is closed, the coil impedance increases and power consumption is low.

The inrush current is 6 to 10 times higher than the sealed current.

#### ■ Electromagnet directly DC powered or via individual rectifier (50-400 Hz):

- the electromagnet is mounted with the reduction in consumption
- 12 to 500 V
- 120 operations/hour.

#### ■ Electromagnet powered via individual rectifier (50-400 Hz):

- the electromagnet is mounted with the reduction in consumption
- 12 to 500 V
- 120 operations/hour.

At the moment of inrush, the full actuating voltage is applied to the coil and the inrush current is determined by the coil resistance.

In the sealed state an additional resistor is switched automatically in series with the coil, so as to reduce power consumption.

This economy resistor is switched by a N/C auxiliary contact which is adjusted to open only when the armature is fully closed.

The inrush current is 15 to 40 times higher than the sealed current.

Coils type WB1, used in conjunction with laminated iron cores, have a much higher inrush current than sealed current, whatever the nature of the supply current.

When establishing the current and selecting the supply voltage rating, it is important to take into account the line voltage drop due to the inrush current.

#### Electromagnet with U shaped core and coil type WB2 for d.c. supply

##### ■ Electromagnet with U shaped solid iron core, type EK:

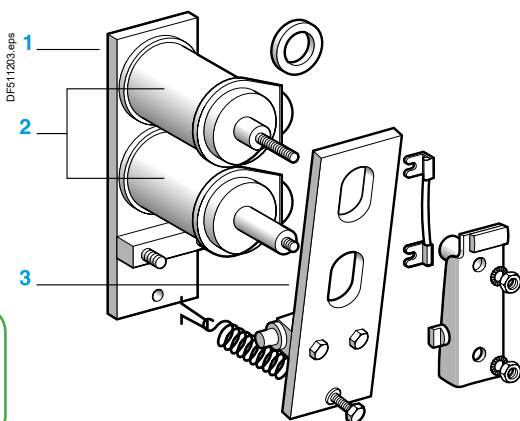
- 2 similar coils type **WB2** connected in series, one coil being fitted to each limb of the core
- the armature rotates.

##### ■ Electromagnet for d.c. supply

- 12 to 600 V
- 1200 operations/hour.

The coils for this type of electromagnet have a considerable number of turns so as to obtain sufficient magnetic flux to attract the armature.

Due to its simplicity and relatively slow movements the assembly is very robust and, therefore, has increased mechanical durability.



#### Electromagnet EK

- 1 Electromagnet core
- 2 Coil
- 3 Electromagnet armature



### Instantaneous and time delay auxiliary contacts

Signalling, electrical interlocking and slave functions can be achieved by using auxiliary contacts.

Instantaneous auxiliary contacts suitable for use with all contactor types are available:

- 1 block of 3 instantaneous N/O contacts and 2 N/C instantaneous contacts, reference LA1BN32A.

Delayed auxiliary contacts can be mounted onto contactors CV1 and CV3:

- On the block LA1BN32A, 1 block of N/O ON-delayed contact + 1 N/C ON-delayed contact, references LADT0 (delay from 0.1 to 3 s), LADT2 (0.1 to 30 s), LADT4 (10 to 180 s)
- On the block ref. LA1BN32A: 1 block of N/O OFF-delayed contact + 1 N/C OFF-delayed contact, references LADR0 (delay from 0.1 to 3 s), LADR4 (10 to 180 s).

The delayed contacts are established or separate some time after the closing or opening of the contactor which operates them. This time is adjustable.

On the block LA1BN32A all TeSys D contactors additives can be mounted, with the exception of LA6DK, LAD6K, LAD8N, LADN01, LADN10.

### Assembling reversing/changeover contactor pairs

#### Mounting accessories

For applications involving the switching of reversing motors or changeover circuits, contactors of different ratings can easily be mounted vertically and interlocked. Mechanical interlock kits are available and auxiliary contacts can be used for electrical interlocking.



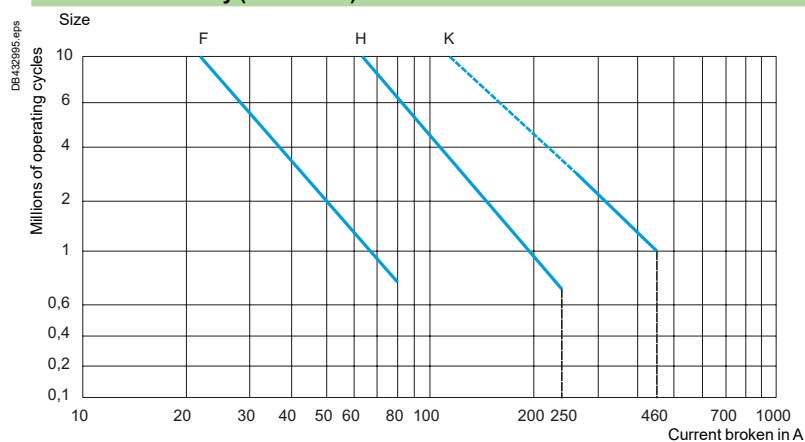
### Selection criteria of the CV1B contactor size - utilisation category AC-3

Rated operational current in A at $\theta \leq 55$ °C						
CV1 contactors	Size					
	F	G <sup>(1)</sup>	H	J <sup>(1)</sup>	K	L <sup>(1)</sup>
Maximum operating rate in operating cycles/hour	1200		1200		1200	
$\leq 440$ V	80		250		460	
500 V	50		200		450	
690 V	35		150		400	

Nominal operational power at $\theta \leq 55$ °C						
CV1 contactors	Size					
	F	G <sup>(1)</sup>	H	J <sup>(1)</sup>	K	L <sup>(1)</sup>
Maximum operating rate in operating cycles/hour	1200		1200		1200	
220/230 V	22		75		140	
380/400 V	37		132		250	
415/440 V	37		140		260	
500 V	30		110		315	
660/690 V	22		110		315	

<sup>(1)</sup> CV1B legacy size 'G', 'J', 'L', please consult us.

### Electrical durability ( $U_e \leq 440$ V)







CV1BF0A

### Contactors reference tables, according standard motor power ratings in category AC-3

#### References

##### 3-pole contactors for motor control

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3						Maximum rated operational current, category AC-3	Instantaneous auxiliary contacts per contactor		Basic reference, to be completed by adding the voltage code <sup>(1) (2)</sup>	Frequently used voltage codes	Weight
220 V	380 V	415 V	440 V	500 V	660/690 V	A					kg
230 V	400 V										
kW	kW	kW	kW	kW	kW						
22	37	37	37	30	22	80	3	2	CV1BF3F0Z00A	E5 F5 M5 Q5	4.000
75	132	140	140	110	110	250	3	2	CV1BH3H0Z00A	E5 F5 M5 Q5	11.000
140	250	260	260	315	315	460	1	1	CV1BK3K0Z0011	F5 M5 Q5	40.000

<sup>(1)</sup> For other compositions, make up the contactor reference as explained on pages B10/29 to B10/31.

<sup>(2)</sup> Standard control circuit voltages (variable delivery, please contact us):

Volts	48	110	120	127	208	220	230	240	380	400	440
50 Hz	E5	F5	–	G5	–	M5	P5	U5	Q5	V5	R5
60 Hz	E6	–	K6	–	L6	M6	P6	U6	Q6	V6	R6
50/60 Hz	E7	F7	K7	G7	L7	M7	P7	U7	Q7	V7	R7
---	ED	FD	KD	GD	–	MD	PD	UD	QD	VD	–
--- + Econ.R. <sup>(3)</sup>	ER	FR	KR	GR	–	MR	PR	UR	QR	VR	–

For other voltages: please consult your Regional Sales Office.

<sup>(3)</sup> Econ.R.: Economy resistor.



### Selection criteria of the CV1B contactor size - utilisation category AC-1

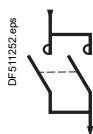
Maximum rated operational current (open-mounted device)						
CV1 contactors	Size					
	F	G <sup>(1)</sup>	H	J <sup>(1)</sup>	K	L <sup>(1)</sup>
Maximum operating rate in operating cycles/hour	1200		1200		1200	
Connections						
Cable	C.s.a.	mm <sup>2</sup>	25	185	—	
Bars	Number	—	—	—	2	
	C.s.a.	mm	—	—	40 x 5	
$\leq 40$ °C	A	80	300	630		
$\leq 55$ °C	A	80	300	600		
$\leq 70$ °C	A	80	300	550		

<sup>(1)</sup> CV1B legacy size 'G', 'J', 'L', please consult us.

### Increase in operational current by paralleling of poles

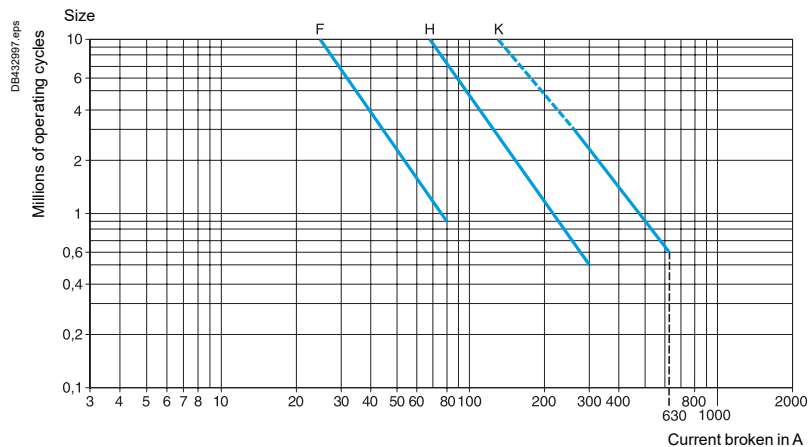
Apply the following multiplying factors to the current values given above. The factors take into account the often unbalanced current distribution between poles:

- 2 poles in parallel: K = 1.6
- 3 poles in parallel: K = 2.25
- 4 poles in parallel: K = 2.8.



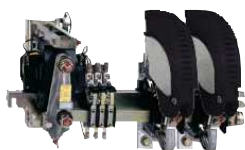
Example: 2 poles in parallel.

### Electrical durability ( $U_e \leq 440$ V)





PB112362.eps



CV1BK

### Selection criteria of the CV1B contactor size - utilisation category AC-1

Maximum possibilities of the contactor, new design (size F to H)

N/O poles	N/C poles
0	1
1	0
1	1
2	0
2	1
3	0
4	0

For another combination, please contact us.

Maximum possibilities of the standard contactor (size K)

N/O poles	N/C poles
0	1
1	0
1	1
0	2
2	0
2	1
3	0
4	0

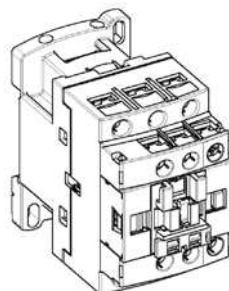
### Auxiliaries contacts

■ Size F-H, 5 instantaneous contacts (3N/C + 2N/O) + TeSys D contactor (except for LA6DK, LADN01, LADN10, LAD6K and LAD8N).

### Electromagnet and coil(s)







- For direct a.c. control
- For direct d.c. control
- For a.c. or d.c. control via economy resistor  
(accessories: economy resistor + contact, rectifier).

DB403785.eps



LA1BN32A

### Auxiliary contact blocks per contactor

Contact type	Composition		Control circuit			Reference	Weight
			 direct	 direct	 or  with economy resistor		
kg							
Contactor - Size F - H - K							
Instantaneous	3	2	1	1	1	LA1BN32A	0.060
Time delay							
On-delay	1	1	1	1	1	LADT● <sup>(1)</sup>	0.060
Off-delay	1	1	1	1	1	LADR● <sup>(1)</sup>	0.060

<sup>(1)</sup> Choose additives LADT● and LADR● from the TeSys D range.



### Selection criteria of the CV1B contactor size - utilisation category AC-2 and AC-4

#### Maximum current broken in A

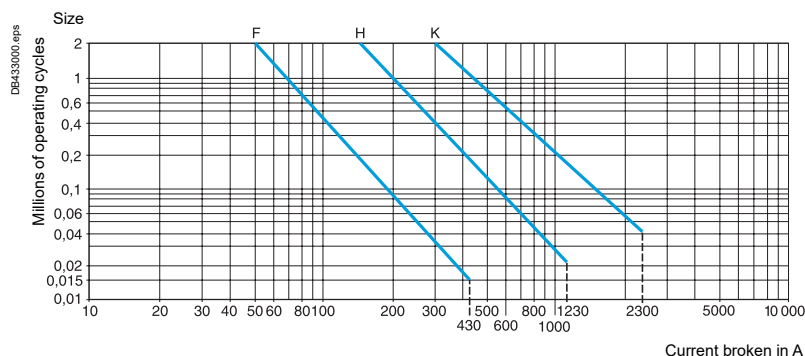
Related to maximum operating rate (operating cycles/hour) and on-load factor

CV1B contactors <sup>(1)</sup>	Size	Maximum current broken in A					
		F	G <sup>(2)</sup>	H	J <sup>(2)</sup>	K	L <sup>(2)</sup>
Operating cycles/hour <sup>(3)</sup> and on-load factor	Thermal limit zone <sup>(4)</sup>						
From 150 and 15 % to 300 and 10 %	<b>A</b>	165		520		1300	
From 150 and 20 % to 600 and 10 %	<b>B</b>	145		460		1150	
From 150 and 30 % to 1200 and 10 %	<b>C</b>	120		380		950	
From 150 and 55 % to 1200 and 20 %	<b>D</b>	90		280		700	
From 150 and 85 % to 1200 and 35 %	<b>E</b>	70		220		550	

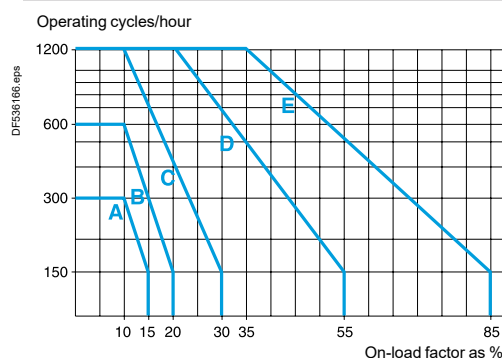
#### Counter current braking (plugging)

The current varies from the maximum counter current braking value up to the nominal motor current. The current made must be compatible with the making and breaking capacities of the contactor. In most cases, breaking occurs at a current value close to the locked rotor current and contactor selection can therefore be made using the criteria for utilisation categories AC-2 and AC-4.

#### Electrical durability ( $U_e \leq 440$ V)



#### Example: contactor size selection



For an on-load factor of 17 % at 180 operating cycles per hour, the above curve indicates zone B. If the maximum current broken is 200 A, the table above will lead to the selection of a size H contactor. Referring to the electrical durability curves, it can be seen that the contactor will have a life of 1 million operating cycles. Where a higher value of electrical durability is required, 2 million operating cycles for example, size K would be recommended.

<sup>(1)</sup> To obtain the complete reference of the contactor see the Symbol combination table on pages B10/29 to B10/31. For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.

<sup>(2)</sup> CV1B legacy size 'G', 'J', 'L', please consult us.

<sup>(3)</sup> Do not exceed the maximum limit for the mechanical operating cycles.

<sup>(4)</sup> See curve at foot of page for thermal limit zone.



Bar  
mounted  
contactors



### Selection criteria of the CV1B contactor size

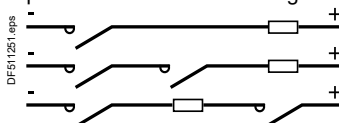
#### - utilization category DC-1

The selection of the contactor size and number of poles to be connected in series is made according to:

- the maximum operational voltage  $U_e$
- the power broken
- the required electrical durability
- the nature of the load, in particular the time constant  $L/R$
- the thermal operating conditions.

#### Maximum operational voltage $U_e$

This depends on the time constant of the circuit  $L/R \leq 1$  ms and the number of poles connected in series, on a single polarity or divided between both polarities (it is preferable to connect the negative polarity to the fixed contact side).



#### Number of poles to be connected in series according to the operational voltage (time constant of the circuit $L/R \leq 1$ ms)

CV1B contactors <sup>(1)</sup>		Size		
		F	H	K
1 pole PN1	V	220	220	220
2 poles PN1 in series	V	440	440	440
1 pole PN3	V	—	—	500
2 poles PN3 in series	V	—	—	1000

Normal operation:  $U_e \geq U$  supply.

#### Rated operational current in A at $\theta \leq 40$ °C

CV1B contactors	Size		
	F	H	K
	80	300	630

The use of a contactor selected according to the table above ensures current breaking up to 4 times the operational current.

#### Increase in rated operational current by connecting 2 poles in parallel

The equivalent operational current for 2 poles in parallel is equal to  $2 \times I_e \times 0.8$ .



<sup>(1)</sup> To obtain the complete reference of the contactor refer to pages B10/29 to B10/31.  
For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.



Selection guide for utilisation categorie DC-1 according to required electrical durability

Power broken			
Utilisation categories	U broken	I broken	P broken
DC-1: Non inductive or slightly inductive loads	Ue	Ie	Ue x Ie

Electrical durability (time constant L/R ≤ 1 ms)

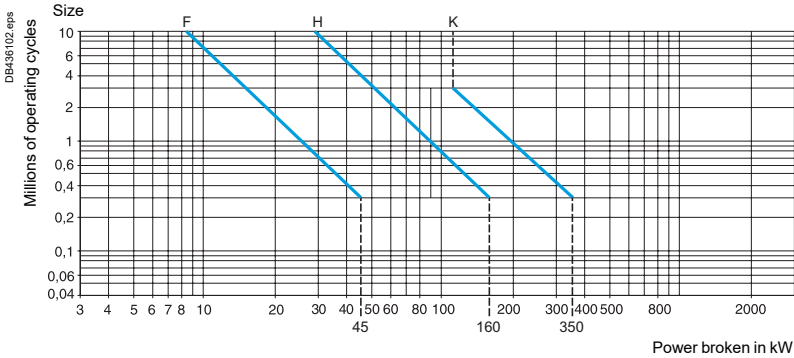
The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:

$P_{broken} = U_{broken} \times I_{broken}$

The table gives the values of Uc and Ic for the various utilisation categories.

Two-pole switching (time constant L/R ≤ 1 ms)

The required durability can be obtained, depending on the application, by increasing the number of poles in series or in parallel, or by increasing the contactor size.



Number of main poles

The curve shows the number of operating cycles according to the power broken by two main poles connected in series. For a single pole, double the value of power broken before using the curves.

Thermal limit

The following limits must not be exceeded: 120 operating cycles/hour at 60 % or 300 operating cycles/hour at 30 % on-load factor, at the rated operational current Ie.

Bar  
mounted  
contactors



### Selection criteria of the CV1B contactor size

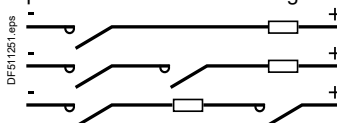
#### - utilisation category DC-3 and DC-5

The selection of the contactor size and number of poles to be connected in series is made according to:

- the maximum operational voltage  $U_e$
- the power broken
- the required electrical durability
- the nature of the load, in particular the time constant  $L/R$
- the thermal operating conditions.

#### Maximum operational voltage $U_e$

This depends on the time constant of the circuit  $L/R \leq 15$  ms and the number of poles connected in series, on a single polarity or divided between both polarities (it is preferable to connect the negative polarity to the fixed contact side).



#### Number of poles to be connected in series according to the operational voltage (time constant of the circuit $L/R \leq 15$ ms)

CV1B contactors <sup>(1)</sup>		Size		
		F	H	K
1 pole PN1	V	220	220	220
2 poles PN1 in series	V	440	440	440
1 pole PN3	V	–	–	440
2 poles PN3 in series	V	–	–	850

Normal operation:  $U_e \geq U$  supply.

With breaking during counter current braking (plugging):  $U_e \geq 1.5 U$  supply.

#### Rated operational current in A at $\theta \leq 40$ °C

CV1B contactors		Size		
		F	H	K
		80	300	630

The use of a contactor selected according to the table above ensures current breaking up to 4 times the operational current.

#### Increase in rated operational current by connecting 2 poles in parallel

The equivalent operational current for 2 poles in parallel is equal to  $2 \times I_e \times 0.8$ .



<sup>(1)</sup> To obtain the complete reference of the contactor, refer to pages B10/29 to B10/31.

For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.



### Selection criteria of the CV1B contactor size - utilisation category DC-3 and DC-5

Power broken			
Utilisation categories	U broken	I broken	P broken
DC-3: Shunt motors, reversing, inching	Ue	2.5 Ie	Ue x 2.5 Ie
DC-5: Shunt motors, reversing, inching	Ue	2.5 Ie	Ue x 2.5 Ie

### Electrical durability (time constant $L/R \leq 15$ ms)

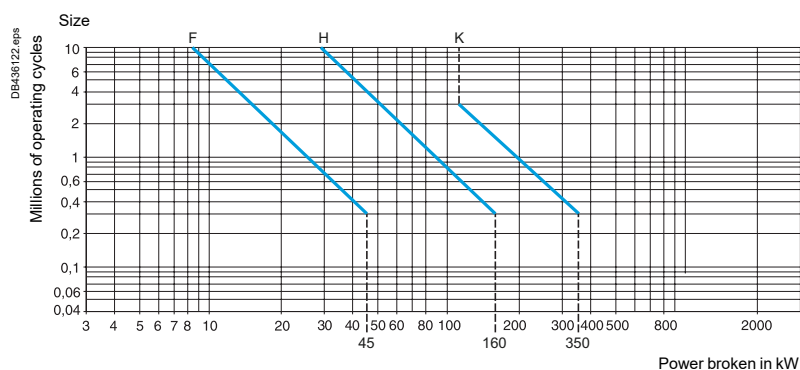
The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:

$$P_{\text{broken}} = U_{\text{broken}} \times I_{\text{broken}}$$

The table gives the values of  $U_c$  and  $I_c$  for the various utilisation categories.

### Two-pole switching (time constant $L/R \leq 15$ ms)

The required durability can be obtained, depending on the application, by increasing the number of poles in series or in parallel, or by increasing the contactor size.



### Number of main poles

The curve shows the number of operating cycles according to the power broken by two main poles connected in series. For a single pole, double the value of power broken before using the curves.

### Thermal limit

The following limits must not be exceeded: 120 operating cycles/hour at 60 % or 300 operating cycles/hour at 30 % on-load factor, at the rated operational current Ie.



### Selection criteria of the CV3B and LC1B contactor size - utilization category AC-3

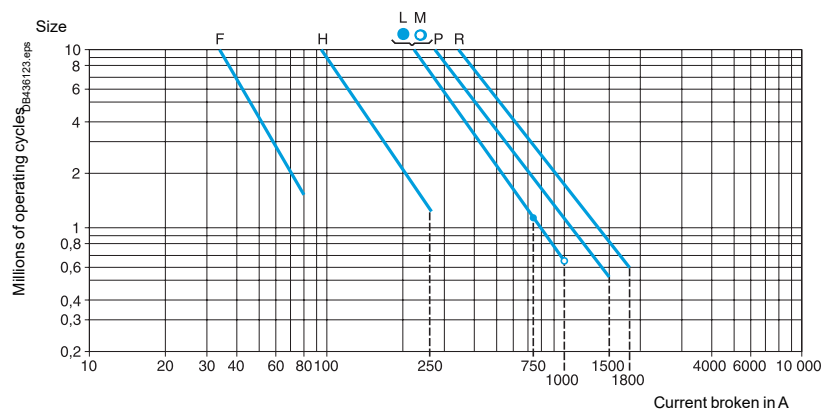
Rated operational current in A at $\theta \leq 55$ °C								
Contactors CV3 and LC1B	Size							
	F	G <sup>(1)</sup>	H	J <sup>(1)</sup>	K <sup>(1)</sup>	L	M	P R
Maximum operating rate in operating cycles/hour	1200		1200			120	120	120 120
$\leq 440$ V	80		290			800	1000	1500 1800
500 V	80		250			800	1000	1500 1800
690 V	70		240			750	900	1000 1100
1000 V	70		220			500	500	600 700

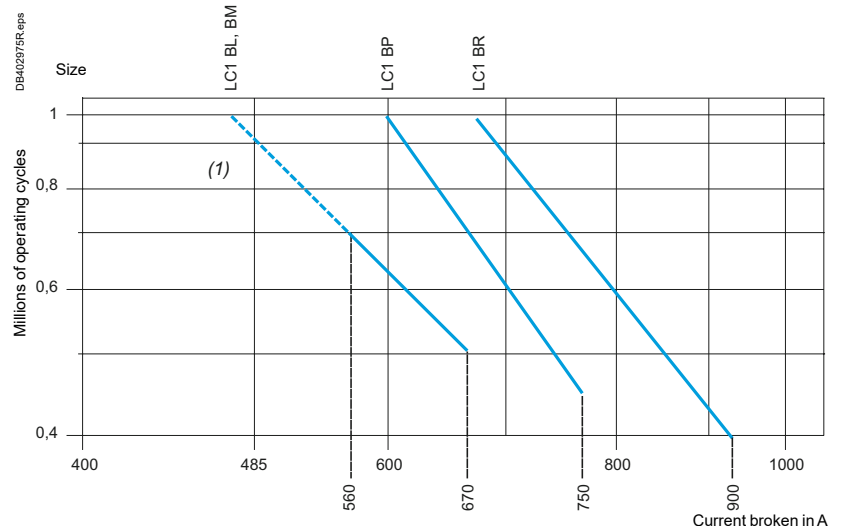
Nominal operational power at $\theta \leq 55$ °C								
Contactors CV3 and LC1B	Size							
	F	G <sup>(1)</sup>	H	J <sup>(1)</sup>	K <sup>(1)</sup>	L	M	P R
Maximum operating rate in operating cycles/hour	1200		1200			120	120	120 120
220/230 V	22		75			220	280	425 500
380/400 V	37		132			400	500	750 900
415 V	37		132			425	530	800 900
440 V	45		132			450	560	800 900
500 V	45		160			500	600	750 900
660/690 V	55		200			560	670	750 900
1000 V	90		250			530	530	670 750

<sup>(1)</sup> CV3B legacy size 'G', 'J', 'K', please consult us.

#### Electrical durability ( $U_e \leq 440$ V)



#### Electrical durability ( $U_e \leq 690$ V)









CV3BF



CV3BK

### References

#### Contactors for motor control in category AC-3, from 80 to 460 A

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3							Maximum rated operational current, category AC-3	Instantaneous auxiliary contacts per contactor		Basic reference, to be completed by adding the voltage code <sup>(1)</sup> <sup>(2)</sup>	Frequently used voltage codes	Weight
220 V	380 V	415 V	440 V	500 V	660/ 230 V	1000 V						
220 V	380 V	415 V	440 V	500 V	660/ 230 V	1000 V						
kW	kW	kW	kW	kW	kW	kW	A					kg
22	37	37	45	45	55	90	80	3	2	CV3BF3F0Z●●A	E5 F5 M5 Q5	10.600
75	132	132	132	160	200	250	285	3	2	CV3BH3F0Z●●A	E5 F5 M5 Q5	15.000

(1) For other compositions, make up the contactor reference as explained on pages B10/29 and B10/30.


(2) Standard control circuit voltages (variable delivery, please contact us):

Volts	48	110	120	127	208	220	230	240	380	400	440
50 Hz	E5	F5	—	G5	—	M5	P5	U5	Q5	V5	R5
60 Hz	E6	—	K6	—	L6	M6	P6	U6	Q6	V6	R6
50/60 Hz	E7	F7	K7	G7	L7	M7	P7	U7	Q7	V7	R7
—	ED	FD	KD	GD	—	MD	PD	UD	QD	VD	—
— + Econ.R. <sup>(3)</sup>	ER	FR	KR	GR	—	MR	PR	UR	QR	VR	—

For other voltages: please consult your Regional Sales Office.

(3) Econ.R.: Economy resistor.

#### Contactors for motor control in category AC-3, from 750 to 1800 A (~ or —)

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3							Maximum rated operational current in AC-3	<div>Instantaneous auxiliary contacts per contactor <sup>(4)</sup></div> <div></div>	Basic reference, to be completed by adding the voltage code	Frequently used voltage codes	Weight	
220 V 230 V	380 V 400 V	415 V	440 V	500 V	660 V 690 V	1000 V						
kW	kW	kW	kW	kW	kW	kW						A
220	400	425	450	500	560	530	800	2	2	LC1BL33●22	G P V	57.000
								3	1	LC1BL33●31	G P V	57.000
								1	3	LC1BL33●13	G P V	57.000
								4	–	LC1BL33●40	G P V	57.000
280	500	530	560	600	670	530	1000	2	2	LC1BM33●22	G P V	60.000
								3	1	LC1BM33●31	G P V	60.000
								1	3	LC1BM33●13	G P V	60.000
								4	–	LC1BM33●40	G P V	60.000
425	750	800	800	700	750	670	1500	2	2	LC1BP33●22	G P V	94.000
								3	1	LC1BP33●31	G P V	94.000
								1	3	LC1BP33●13	G P V	94.000
								4	–	LC1BP33●40	G P V	94.000
500	900	900	900	900	900	750	1800	2	2	LC1BR33●22	G P V	129.000
								3	1	LC1BR33●31	G P V	129.000
								1	3	LC1BR33●13	G P V	129.000
								4	–	LC1BR33●40	G P V	129.000

(4) Standard control circuit voltages (variable delivery, please contact us):

Volts	48	110	120	125	127	220	230	240	380	400	415	440	500
~ 50...400 Hz	—	F	K	—	G	M	P	U	Q	V	N	R	S
—	ED	FD	—	GD	—	MD	—	UD	—	—	—	RD	SD

For voltages other than those listed above, please consult us.



LC1BP



### Selection criteria of the CV3B and LC1B contactor size - utilization category AC-1

#### Maximum rated operational current (open-mounted device)

Contactors CV3 and LC1B	Size							
	F	G <sup>(1)</sup>	H	J <sup>(1)</sup>	K <sup>(1)</sup>	L	M	P R
Maximum operating rate in operating cycles/hour	1200		1200			120	120	120 120
Connections								
Cable	C.s.a.	mm <sup>2</sup>	25	120		—	—	—
Bars	Number	—	—			2	2	3 3
	C.s.a.	mm	—	—		50 x 5	80 x 5	100 x 5 100 x 10
$\leq 40$ °C	A	80	250			800	1250	2000 2750
$\leq 55$ °C	A	80	250			700	1100	1750 2400
$\leq 70$ °C	A	80	250			600	900	1500 2000

<sup>(1)</sup> CV3B legacy size 'G', 'J', 'K', please consult us.

#### Increase in operational current by paralleling of poles

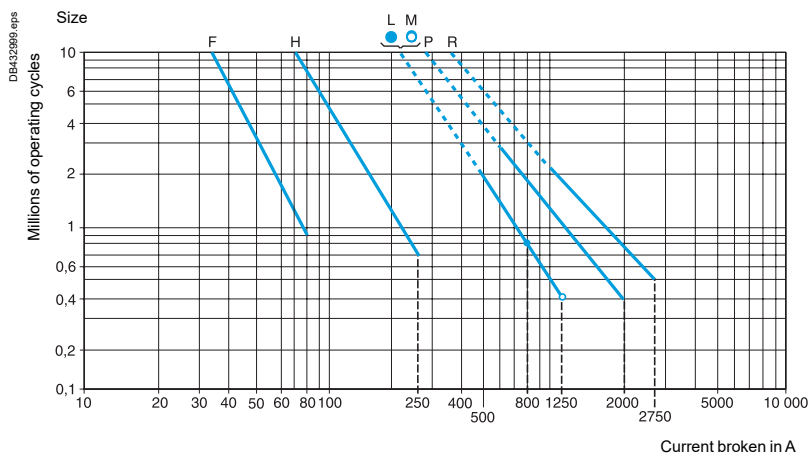
Apply the following multiplying factors to the current values given above. The factors take into account the often unbalanced current distribution between poles:

- 2 poles in parallel: K = 1.6
- 3 poles in parallel: K = 2.25
- 4 poles in parallel: K = 2.8.



Example: 2 poles in parallel.

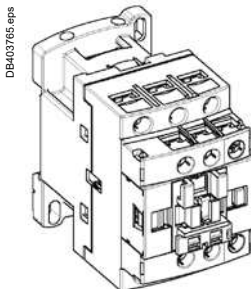
#### Electrical durability ( $U_e \leq 440$ V)







CV3BF



LA1BN32A

Selection criteria of the CV3B and LC1B contactor size  
- utilization category AC-1

Maximum possibilities of the contactor

CV3B contactors are characterised by their extensive composition alternatives:

■ Poles <sup>(1)</sup>







Size F - H		Size L - M - P - R	
N/O poles	N/C poles	N/O poles	N/C poles
0	1	1	0
1	0	2	0
1	1	3	0
2	0	4	0
2	1		
3	0		
4	0		

Auxiliaries contacts

■ Size F-H, 5 instantaneous contacts (3N/C + 2N/O) + TeSys D contactor (except for LA6DK, LAD6K, LADN01, LADN10 and LAD8N).

Electromagnet and coil(s)

- For direct a.c. control
- For direct d.c. control
- For a.c. or d.c. control via economy resistor (accessories: economy resistor + contact, rectifier).

Auxiliary contact blocks contactor - Size F - H							
Contact type	Composition		Control circuit			Reference	Weight
			 direct	 direct	 or  with economy resistor		kg
Instantaneous	3	2	1	1	1	LA1BN32A	0.060
Time delay							
On-delay	1	1	1	1	1	LADT● <sup>(2)</sup>	0.060
Off-delay	1	1	1	1	1	LADR● <sup>(2)</sup>	0.060

(1) For possible compositions, see pages B10/29 to B10/31.

(2) Choose additives LADT● and LADR● from the TeSys D range.



### Selection criteria of the CV3B and LC1B contactor size - utilization category AC-2 and AC-4

#### Thermal limits

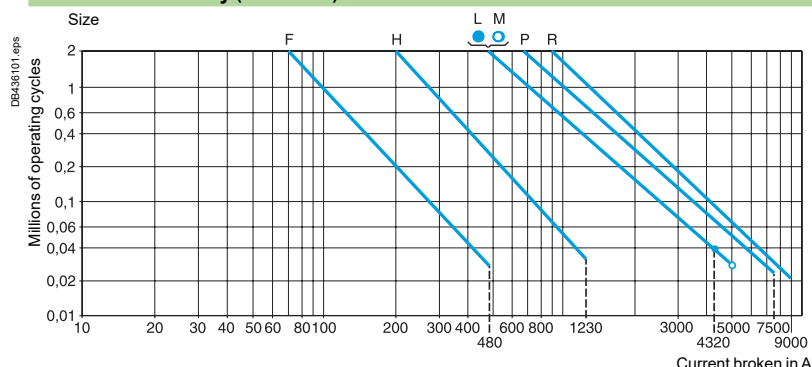
Related to maximum operating rate (operating cycles/hour) and on-load factor

Contactors CV3 <sup>(1)</sup> and LC1B	Size	Size							
		F	G <sup>(2)</sup>	H	J <sup>(2)</sup>	K <sup>(2)</sup>	L	M	P R
Operating cycles/hour <sup>(3)</sup> and on-load factor	Thermal limit zone <sup>(4)</sup>	Maximum current broken depending on the duty Thermal limit at ambient temperature $\leq 55$ °C							
From 150 and 15 % to 300 and 10 %	A	165		520			2250	3000	4500 5400
From 150 and 20 % to 600 and 10 %	B	145		460			2000	2400	3750 5000
From 150 and 30 % to 1200 and 10 %	C	120		380			1500	2000	3000 3600
From 150 and 55 % to 1200 and 20 %	D	90		280			1000	1500	2000 2500
From 150 and 85 % to 1200 and 35 %	E	70		220			750	1000	1500 1800

#### Counter current braking (plugging)

The current varies from the maximum counter current braking value up to the nominal motor current. The current made must be compatible with the making and breaking capacities of the contactor. In most cases, breaking occurs at a current value close to the locked rotor current and contactor selection can therefore be made using the criteria for utilisation categories AC-2 and AC-4.

#### Electrical durability ( $U_e \leq 440$ V)

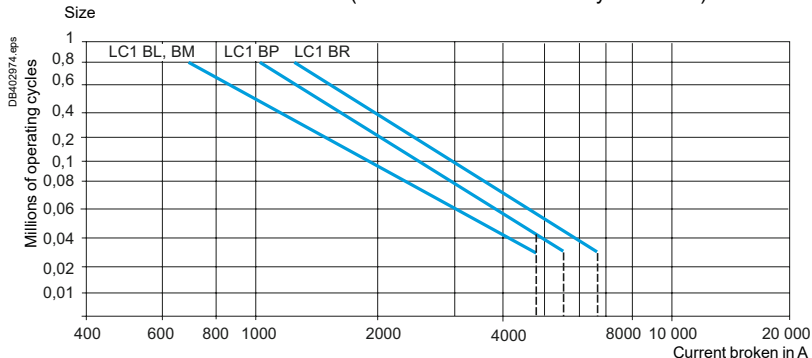


#### Example:

For an on-load factor of 17 % at 180 operating cycles per hour, the above curve indicates zone B. If the maximum current broken is 90 A, the table above will lead to the selection of a size F contactor. Referring to the electrical durability curves, it can be seen that the contactor will have a life of 1 100 000 operating cycles. Where a higher value of electrical durability is required, 2 million operating cycles for example, size H would be recommended.

#### Electrical durability ( $U_e \leq 690$ V)

Control of 3 phase asynchronous squirrel cage motors with "motor stalled" stop. The current  $I_c$  cut in AC-4 is 6 x  $I_e$ . ( $I_e$  = rated current drawn by the motor).



- (1) To obtain the complete reference of the contactor see the Symbol combination table on pages B10/29 to B10/31. For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.
- (2) CV3B legacy size 'G', 'J', 'K', please consult us.
- (3) Do not exceed the maximum limit for the mechanical operating cycles.
- (4) See curve at the previous page for thermal limit zone.



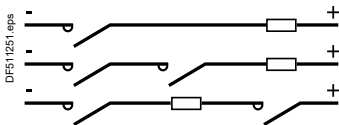
**Selection criteria of the CV3B and LC1B contactor size  
- utilization category DC-1**

The selection of the contactor size and number of poles to be connected in series is made according to:

- the maximum operational voltage  $U_e$
- the power broken
- the required electrical durability
- the nature of the load, in particular the time constant L/R
- the thermal operating conditions.

**Maximum operational voltage  $U_e$**

This depends on the time constant L/R of the circuit and the number of poles connected in series, on a single polarity or divided between both polarities (it is preferable to connect the negative polarity to the fixed contact side).



**Number of poles to be connected in series according to the operational voltage**

Operational voltage	500 V	1
	1000 V	2
	1500 V	Please, consult us.

Normal operation:  $U_e \geq U_{\text{supply}}$ .

**Rated operational current in A at  $\theta \leq 40^\circ\text{C}$**

Contactor size CV3B <sup>(1)</sup>		CV3B and LC1B			
F	H	L	M	P	R
80	300	800	1000	1800	2500

The use of a contactor selected according to the table above ensures current breaking up to 4 times the operational current.

**Increase in rated operational current by connecting 2 poles in parallel**

The equivalent operational current for 2 poles in parallel is equal to  $2 \times I_e \times 0.8$ .



<sup>(1)</sup> To obtain the complete reference of the contactor refer to pages B10/29 and B10/30.  
For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.



### Selection criteria of the CV3B and LC1B contactor size - utilization category DC-1

#### Power broken

Utilisation category	U broken	I broken	P broken
DC-1: Non inductive or slightly inductive loads	U <sub>e</sub>	I <sub>e</sub>	U <sub>e</sub> x I <sub>e</sub>

#### Electrical durability (time constant L/R $\leq 1$ ms)

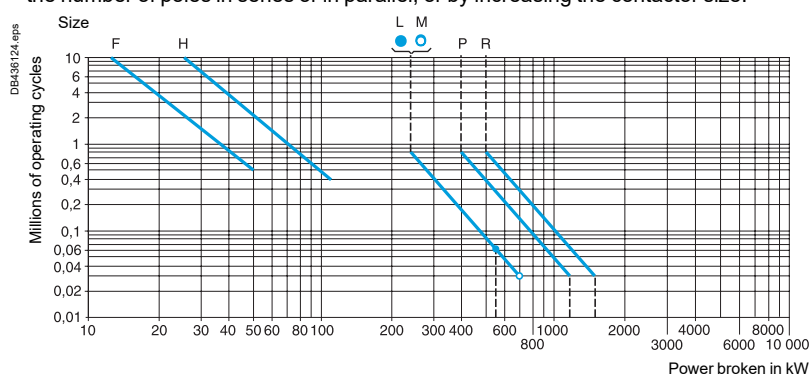
The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:

P broken = U broken x I broken.

The table gives the values of U<sub>c</sub> and I<sub>c</sub> for the various utilisation categories.

#### Power broken per pole (time constant L/R $\leq 1$ ms)

The required durability can be obtained, depending on the application, by increasing the number of poles in series or in parallel, or by increasing the contactor size.



#### Number of main poles

The curve shows the number of operating cycles according to the power broken by two main poles connected in series. For a single pole, double the value of power broken before using the curves.

#### Thermal limit

The following limits must not be exceeded: 120 operating cycles/hour at 60 % or 300 operating cycles/hour at 30 % on-load factor, at the rated operational current I<sub>e</sub>.



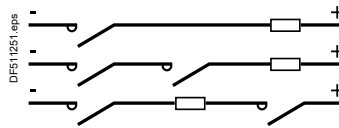
### Selection criteria of the CV3B and LC1B contactor size - utilization category DC-3 and DC-5

The selection of the contactor size and number of poles to be connected in series is made according to:

- the maximum operational voltage  $U_e$
- the power broken
- the required electrical durability
- the nature of the load, in particular the time constant L/R
- the thermal operating conditions.

#### Maximum operational voltage $U_e$

This depends on the time constant L/R of the circuit and the number of poles connected in series, on a single polarity or divided between both polarities (it is preferable to connect the negative polarity to the fixed contact side).



#### Number of poles to be connected in series according to the operational voltage and time constant L/R (in ms) of the circuit

Time constant in ms		15	30	60	90	120	150
Operational voltage	125 V	1	1	1	2	2	2
	225 V	1	1	2	3	3	4
	330 V	1	2	3	3	4	—
	440 V	1	2	3	4	—	—
	850 V	2	3	4	—	—	—
	1200 V (consult us)	3	4	—	—	—	—
	1500 V (consult us)	4	—	—	—	—	—

Normal operation:  $U_e \geq U$  supply.

With breaking during counter current braking (plugging):  $U_e \geq 1.5 U$  supply.

#### Rated operational current in A at $\theta \leq 40^\circ\text{C}$

Contactor size CV3B <sup>(1)</sup>		CV3B and LC1B			
F	H	L	M	P	R
80	300	800	1000	1800	2500

The use of a contactor selected according to the table above ensures current breaking up to 4 times the operational current.

#### Increase in rated operational current by connecting 2 poles in parallel

The equivalent operational current for 2 poles in parallel is equal to  $2 \times I_e \times 0.8$ .



<sup>(1)</sup> To obtain the complete reference of the contactor refer to pages B10/29 and B10/30.  
For customised compositions or dimensional specifications, please use the Order form on page B10/43 or consult your Regional Sales Office.



### Selection criteria of the CV3B and LC1B contactor size - utilization category DC-3 and DC-5

Power broken			
Utilisation category	U broken	I broken	P broken
DC-3: Shunt motors, reversing, inching	Ue	2.5 Ie	Ue x 2.5 Ie
DC-5: Series motors, reversing, inching	Ue	2.5 Ie	Ue x 2.5 Ie

#### Electrical durability (time constant $L/R \leq 15$ ms)

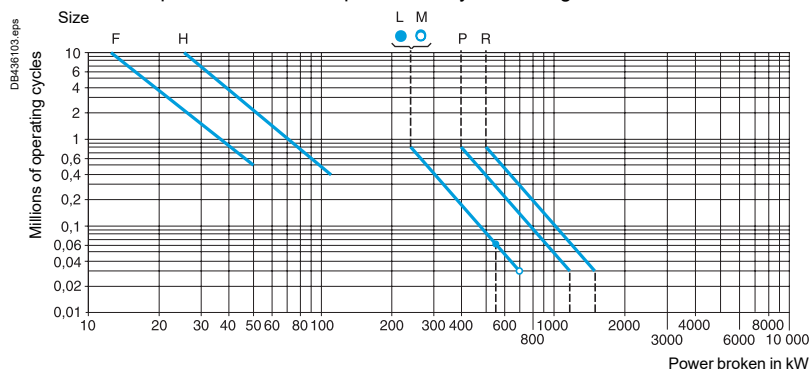
The electrical durability can be read directly from the curves below, having previously calculated the power broken as follows:

$$P_{\text{broken}} = U_{\text{broken}} \times I_{\text{broken}}$$

The table gives the values of  $U_c$  and  $I_c$  for the various utilisation categories.

#### Power broken per pole (time constant $L/R \leq 15$ ms)

The required durability can be obtained, depending on the application, by increasing the number of poles in series or in parallel, or by increasing the contactor size.



Example: 30 kW motor, 500 V-70 A in category DC-3:  $P_{\text{broken}} = U_e \times 2.5 I_e = 500 \times 2.5 \times 70 = 86$  kW or 43 kW per pole.

For a 2-pole size F contactor, the curve gives an electrical durability of  $6 \times 10^5$  operating cycles.

#### Electrical durability depending on the time constant

- According to the time constant  $L/R$ .
- $L/R \leq 15$  ms, read the number of operating cycles directly from the curves.
- $15 < L/R \leq 30$  ms, the number of operating cycles is equal to the number read from the curves  $\times \frac{15}{L/R}$ .
- $L/R > 30$  ms, please consult your Regional Sales Office.

#### Thermal limit

The following limits must not be exceeded: 120 operating cycles/hour at 60 % or 300 operating cycles/hour at 30 % on-load factor, at the rated operational current  $I_e$ .



## From assembly definition to contactor ordering

### Contactor assembly definition

The criteria required to define the composition of a contactor are:

- the number of N/O and N/C power poles
- the current and power supply voltage
- (note: on a d.c. supply, the time constant  $\frac{L}{R}$  of the load must be known in order to define the number of poles to be wired in series to break the arc)
- the control circuit voltage
- the number of auxiliary contacts.

### Contactor ordering - product reference composition

For all contactors:

- configuration software "bar contactor soft-customer.xls"

Link for download: <https://www.se.com/ww/en/product-range-download/667-tesys-b/#/software-firmware-tab>

- from order form in TeSys B catalogue ref. DIA2070702EN.

For contactors CV1BF/BH/BK, CV3BF/BH:

- software or selection tables below.

### Checking of contactor possible assemblies

CV1B and CV3B have some restrictions:

- in rated operational current (Ie) per power pole
- in number of N/O - N/C power poles
- in number of auxiliary contacts.

Please refer to tables below.

### Rated operational current per poles - codes per contactor type

Contactor type		CV1BF CV3BF	CV1BH CV3BH	CV1BK
Rated operational current <sup>(1)</sup>	11 A	E	—	—
	13 A	M	—	—
	20 A	N	—	—
	40 A	P	—	—
	50 A	Q	Q	—
	80 A	F	F	—
	125 A	—	R	I
	200 A	—	G	S
	250 A	—	—	H
	300 A	—	H	—
	320 A	—	—	—
	400 A	—	—	U
	470 A	—	—	—
	500 A	—	—	V
	630 A	—	—	K
	1000 A	—	—	—
0 no magnetic blowing		Z	Z	Z

(1) Other rating: contact us.

### CV1B contactors: maximum number of power poles

Contactor type		CV1BF		CV1BH		CV1BK	
Pole type		N/O	N/C	N/O	N/C	N/O	N/C
Number of poles		5	0	4	0	4	0
		0	2	0	2	0	2
		2	1	2	1	2	1

### CV3B contactors: maximum number of power poles

Contactor type		CV3BF		CV3BH	
Pole type		N/O	N/C	N/O	N/C
Number of poles		5	0	4	0
		0	2	0	2
		1	2	—	—
		3	1	2	1

### CV1B/CV3B contactors: maximum number of auxiliary contacts

Contactor type		CV1B		CV3B	
Pole type		N/O	N/C	N/O	N/C
		4 + 1 time delay if necessary			

### Examples

■ Switching of single-phase capacitor: 400 V - 80 A - 1 N/O main pole. 220 V / 50 Hz. control circuit voltage, 3 N/O and 2 N/C auxiliary contacts. Reference: **CV1BF1F0ZM5A**.

■ Switching of d.c. heating circuits: 800 V - 250 A - 2 N/O main poles - 48 V ---. control circuit, instantaneous auxiliary contact 1 N/O + 1 on-delay. Reference: **CV3BH2H0ZEDA + LADT0, 2 or 4**.

### Other versions

To obtain a composition with more main poles or with more than 4 auxiliary contacts, please use **order form CF 452**, on catalogue DIA2070702EN.



## Product reference coding table

		Serie	Size	Number of N/O poles	Op. current in N/O pole	Number of N/C poles	Op. current in N/C pole	Control voltage	Control frequency	Aux. contacts
<b>Type of contactor related to application</b>										
~ 690 V, ~ 220 V/pole		CV1B								
~ 1000 V, ~ 440 V/pole		CV3B								
<b>Contactor size AC-1/AC-3</b>										
CV1: 80/80 A	CV3: 80/80 A		F *							
CV1: 300/250 A	CV3: 300/285 A		H *							
<b>Number of poles</b>										
N/O poles	0 N/O			0						
	1 N/O			1						
	2 N/O			2						
	3 N/O			3						
	4 N/O			4						
N/C poles	0 N/C				0					
	1 N/C				1					
<b>Operational current (determines the blow-out coil size)</b>										
CV1BF/CV3BF	CV1BH/CV3BH									
AC	DC	AC	DC							
0 A breaking		0 A breaking			Z		Z			
0.9 A	1 A	0.7 A	1.05 A		A		A			
1.75 A	1.9 A	1.25 A	1.95 A		B		B			
3.6 A	4 A	2.5 A	3.85 A		C		C			
6.8 A	7.6 A	4.7 A	7.5 A		D		D			
11 A	12 A	8 A	12 A		E		E			
13 A	14.5 A	10 A	15 A		M		M			
20 A	22 A	17 A	24 A		N		N			
40 A	45 A				P		P			
50 A	55 A	60 A	90 A		Q		Q			
80 A	80 A	80 A	120 A		F		F			
125 A		130 A	190 A		R		R			
200 A		200 A	200 A		G		G			
300 A		300 A	300 A		H		H			
<b>Control circuit voltage</b>										
24 V								B		
48 V								E		
110 V								F		
120 V								K		
127 V								G		
208 V								L		
220 V								M		
230 V								P		
240 V								U		
380 V								Q		
400 V								V		
<b>Operating frequency</b>										
50 Hz								5		
60 Hz								6		
50/60 Hz (with rectifier + economy resistor)								7		
---								D		
--- with economy resistor								R		
<b>Auxiliary contacts (LA1BN32 + additives (fitted as standard))</b>										
Instantaneous	3 N/O + 2 N/C									A

To check whether the symbol combinations are possible, refer to the selection information and guide on page B10/29.  
If in doubt, fill out order form CF 452, on page B10/43.

★ Can use any additives in the range of contactors TeSys D except LA6DK, and LAD6K LAD8N.

## Important information for use by Schneider Electric

To place an order in SAP GRC switch-LOGOS

Example: Order the contactor CV1BH2HCZM5A

■ enter in the Reference product "CV1BH"

■ in the field "Technical text", specify "CV1BH2H02M5A".



### Product reference coding table

		Serie	Size	Number of N/O poles	Op. current in N/O pole	Number of N/C poles	Op. current in N/C pole	Pole type	Control voltage	Control frequency	Aux. contacts	
Type of contactor related to application												
~ 690 V, ≡ 220 V/pole		CV1B										
~ 1000 V, ≡ 440 V/pole												
Contactor size AC-1/AC-3												
CV1: 630/460 A		K										
Number of poles												
N/O poles	0 N/O			0								
	1 N/O			1								
	2 N/O			2								
	3 N/O			3								
	4 N/O			4								
N/C poles	0 N/C					0						
	1 N/C					1						
	2 N/C					2						
Type of poles												
~ 690 V, ≡ 220 V/pole	Type 1 pole (PN1)							1				
~ 1000 V, ≡ 440 V/pole	Type 3 pole (PN3)							3				
Operational current (determines the blow-out coil size)												
0 A breaking				Z		Z						
150 A				I		I						
250 A				S		S						
300 A				H		H						
400 A				U		U						
500 A				V		V						
630 A				K		K						
Control circuit voltage												
24 V								B				
48 V								E				
110 V								F				
120 V								K				
127 V								G				
208 V								L				
220 V								M				
230 V								P				
240 V								U				
380 V								Q				
400 V								V				
415 V								N				
440 V								R				
480 V								T				
500 V								S				
600 V								X				
Operating frequency												
50 Hz										5		
60 Hz										6		
50/60 Hz (with rectifier + economy resistor)										7		
---										D		
--- with economy resistor										R		
Auxiliary contacts (LA1BN32 auxiliary contact block)												
3 N/O - instantaneous		1 aux. contact block										A
2 N/C - instantaneous		2 aux. contact blocks										B

To check whether the symbol combinations are possible, refer to the selection information and guide on page B10/29.  
If in doubt, fill out order form CF 452, on page B10/43.





LC1BP33

### Contactors for motor control in category AC-3, from 750 to 1800 A (~ or ---)

#### 3-pole contactors

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3								Rated operational current in AC-3 440V up to	Instantaneous auxiliary contacts	Basic reference, to be completed by adding the voltage code <sup>(1)</sup>	Weight
220 V	380 V	415 V	440 V	500 V	560 V	660 V	1000 V	A			kg
kW	kW	kW	kW	kW	kW	kW	kW				
220	400	425	450	500	560	530	750		2 2	LC1BL33•22	57.000
									3 1	LC1BL33•31	57.000
									1 3	LC1BL33•13	57.000
									4 -	LC1BL33•40	57.000
280	500	530	560	600	670	530	1000		2 2	LC1BM33•22	60.000
									3 1	LC1BM33•31	60.000
									1 3	LC1BM33•13	60.000
									4 -	LC1BM33•40	60.000
425	750	800	800	750	750	670	1500		2 2	LC1BP33•22	94.000
									3 1	LC1BP33•31	94.000
									1 3	LC1BP33•13	94.000
									4 -	LC1BP33•40	94.000
500	900	900	900	900	900	750	1800		2 2	LC1BR33•22	129.000
									3 1	LC1BR33•31	129.000
									1 3	LC1BR33•13	129.000
									4 -	LC1BR33•40	129.000

### Contactors for control in category AC-1, from 800 to 2750 A (~ or ---)

#### Single, 2, 3 or 4-pole contactors

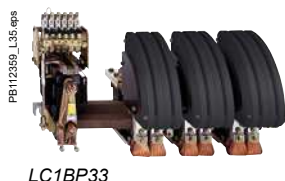
Maximum operational current in AC-1 (θ ≤ 40 °C)	Number of poles	Instantaneous auxiliary contacts		Basic reference, to be completed by adding the voltage code <sup>(1)</sup>	Weight
A					kg
800	1	2	2	LC1BL31•22	31.000
		3	1	LC1BL31•31	31.000
		1	3	LC1BL31•13	31.000
		4	-	LC1BL31•40	31.000
	2	2	2	LC1BL32•22	44.000
		3	1	LC1BL32•31	44.000
		1	3	LC1BL32•13	44.000
		4	-	LC1BL32•40	44.000
	3	2	2	LC1BL33•22	57.000
		3	1	LC1BL33•31	57.000
		1	3	LC1BL33•13	57.000
		4	-	LC1BL33•40	57.000
	4	2	2	LC1BL34•22	71.000
		3	1	LC1BL34•31	71.000
		1	3	LC1BL34•13	71.000
		4	-	LC1BL34•40	71.000

<sup>(1)</sup> Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	48	110	120	125	127	220	230	240	380	400	415	440	500
~ 50...400 Hz	-	F	K	-	G	M	P	U	Q	V	N	R	S
---	ED	FD	-	GD	-	MD	-	UD	-	-	-	RD	SD

For voltages other than those indicated above, replace the p in the reference with the operational voltage (3 figures) and the type of current (2 letters: AC for a.c. supply and DC for d.c. supply). Example: 82 V d.c., the reference becomes LC1BP33082DC22.





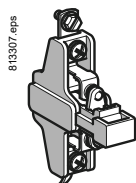
#### Contactors for control in category AC-1, from 800 to 2750 A ( ~ or --- )

##### Single, 2, 3 or 4-pole contactors

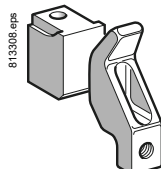
Maximum operational current in AC-1 ( $\theta \leq 40^\circ \text{C}$ )	Number of poles	Instantaneous auxiliary contacts		Basic reference, to be completed by adding the voltage code <sup>(1)</sup>	Weight
<b>A</b>					<b>kg</b>
1250	1	2	2	LC1BM31●22	34.000
		3	1	LC1BM31●31	34.000
		1	3	LC1BM31●13	34.000
		4	—	LC1BM31●40	34.000
	2	2	2	LC1BM32●22	47.000
		3	1	LC1BM32●31	47.000
		1	3	LC1BM32●13	47.000
		4	—	LC1BM32●40	47.000
	3	2	2	LC1BM33●22	60.000
		3	1	LC1BM33●31	60.000
		1	3	LC1BM33●13	60.000
		4	—	LC1BM33●40	60.000
	4	2	2	LC1BM34●22	74.000
		3	1	LC1BM34●31	74.000
		1	3	LC1BM34●13	74.000
		4	—	LC1BM34●40	74.000
2000	1	2	2	LC1BP31●22	41.000
		3	1	LC1BP31●31	41.000
		1	3	LC1BP31●13	41.000
		4	—	LC1BP31●40	41.000
	2	2	2	LC1BP32●22	65.000
		3	1	LC1BP32●31	65.000
		1	3	LC1BP32●13	65.000
		4	—	LC1BP32●40	65.000
	3	2	2	LC1BP33●22	94.000
		3	1	LC1BP33●31	94.000
		1	3	LC1BP33●13	94.000
		4	—	LC1BP33●40	94.000
	4	2	2	LC1BP34●22	120.000
		3	1	LC1BP34●31	120.000
		1	3	LC1BP34●13	120.000
		4	—	LC1BP34●40	120.000
2750	1	2	2	LC1BR31●22	52.000
		3	1	LC1BR31●31	52.000
		1	3	LC1BR31●13	52.000
		4	—	LC1BR31●40	52.000
	2	2	2	LC1BR32●22	85.000
		3	1	LC1BR32●31	85.000
		1	3	LC1BR32●13	85.000
		4	—	LC1BR32●40	85.000
	3	2	2	LC1BR33●22	129.000
		3	1	LC1BR33●31	129.000
		1	3	LC1BR33●13	129.000
		4	—	LC1BR33●40	129.000
	4	2	2	LC1BR34●22	160.000
		3	1	LC1BR34●31	160.000
		1	3	LC1BR34●13	160.000
		4	—	LC1BR34●40	160.000

<sup>(1)</sup> See previous page.

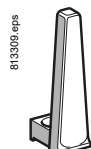




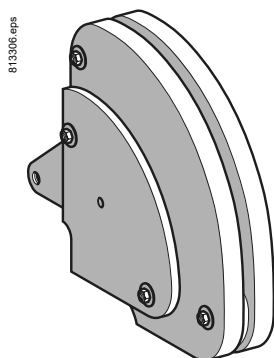
ZC4GM1



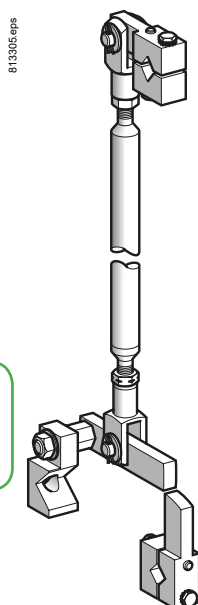
PA1LB80  
(PA1LB76 + PA1LB75)



PA1LB89



PA1LB50



EZ2LB0601

Bar  
mounted  
contactors

### Spare parts

Description	For contactor	Composition	Reference	Weight kg
Instantaneous auxiliary contact blocks	LC1B	1 N/O	ZC4GM1	0.030
		1 N/C	ZC4GM2	0.030

Description	For contactor	Number of sets required per contactor pole	Set reference	Weight kg
Set of contacts (1 moving contact, 1 fixed contact)	LC1BL	1	PA1LB80	0.420
	LC1BM	1	PA1LB80	0.420
	LC1BP	2	PA1LB80	0.420
	LC1BR	3	PA1LB80	0.420

Description	For contactor	Reference	Weight kg
Moving contact only (for 1 finger)	LC1B	PA1LB75	0.220
Fixed contact only (for 1 finger)	LC1B	PA1LB76	0.200
Blow-out horn only (for 1 finger)	LC1B	PA1LB89	0.120
Arc chamber (for 1 contactor pole)	LC1BL	PA1LB50	3.700
	LC1BM	PA1LB50	3.700
	LC1BP	PA1PB50	6.200
	LC1BR	PA1RB50	8.500

### Mounting accessories

Description	For contactor	Sold in lots of	Unit reference	Weight kg
Bar support bracket for mounting on 120 or 150 mm centres	LC1BL to BR	2	LA9B103	1.620

### Assembly of two vertically mounted contactors by the customer

Description	For contactor	Reference	Weight kg
Mechanical interlock LC1B and locking device components		EZ2LB0601	1.280

### Specifications

- Positive mechanical interlock between two vertically mounted contactors of the same or different ratings.
- Connecting rod with cranks mounted on the right-hand, pole side.
- Vertical fixing centres of the two contactors: 600 mm.

Description	Specification	Height mm	Sold in lots of	Unit reference	Weight kg
Notched mounting rails used as uprights and as equipment support	2 mm steel, with zinc chromate treatment	1650	4	AM1EC165	2.460
		1850	4	AM1EC185	2.760
		2000	4	AM1EC200	2.980
1/4 turn sliding clip nut and corresponding screw for assembly of rails AM1EC	M8	—	10	NSYSNM8	0.020
	M8 x 18	—	10	AF1VC820	0.024

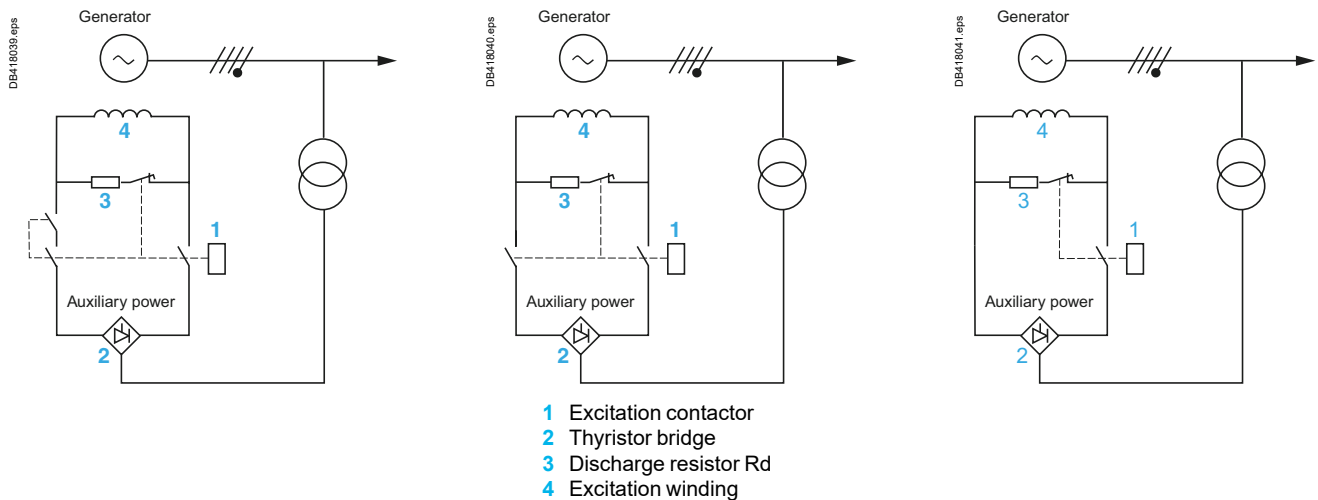


### Introduction

Variable composition contactors CVE, CWE, CVX, CRX, CWXB are designed for switching the excitation circuits of synchronous machines, in particular electrical power station generators, for operational currents from 80 to 2750 A.

Example: Static excitation generator.

### Basic scheme



### Operating principle

The voltage delivered by the generator is related to the current flowing through the excitation winding 4.

#### Start-up phase

- The contactor 1 closes, off load.
- An adjustable auxiliary power supply generates current in the excitation winding 4 to allow power-up of the generator.
- When the voltage delivered by the generator is sufficient to supply the excitation winding 4 via a thyristor bridge 2, the auxiliary supply is switched off.

#### Stop phase

When a stop instruction is received, the thyristor bridge 2 operates for a few seconds as an inverter, then the excitation contactor 1 opens. The function of the N/C pole is to discharge residual electromagnetic energy from the excitation winding 4 via the discharge resistor  $R_d$  3.

Under normal operating conditions, breaking is therefore easy, especially as the N/O poles and the N/C pole are make before break.

However, in the event of a problem, the contactor must be able to break.

#### Contactors selection

Selection is done according to the nominal operating voltage of the machine and the necessity or not to fully isolate the thyristor bridge coil of the power supply (1, 2, or 3 N/O poles).

**Note:** The N/C pole, which is used for machine de-excitation, has no arc chambers. Its breaking capacity is nil. Re-energisation of the contactor must therefore be avoided during the de-excitation phase.  
If there is any risk of this happening, it is advisable to add an off-delay function that prevents pick-up of the contactor for the 10 seconds following drop-out.



### CVEB and CWEB contactors composition:

- 2 or N/O poles with magnetic blow-out (80...300 A)
- 1 N/C pole without blow-out, overlapping contacts (possible mounting of a blow-out device)
- 1 electromagnet with d.c. supply
- either mechanical latching (CWEB)
- or with economy resistor (CVEB).
- 1 ZC4GM auxiliary contact or 1 or 2 instantaneous auxiliary contact heads (3 to 6 N/O contacts + 2 to 4 N/C contacts).
- 1 mounting bar, 1 rotary drive shaft.

The following can be added:

- 1 or 2 blocks of 4 instantaneous auxiliary contacts LADN●●, without increasing the overall size of the contactor
- or 1 time delay block LADT● or LADR●.

**Note:** it is not possible to fit a mechanical latch block type LA6DK●● on these contactors.

Characteristics						
CVEB, CWEB contactor sizes			F		H	
N/O pole			1 pole	2 poles	1 pole	2 poles
Rated current	$\theta \leq 40^{\circ}\text{C}$	A	80	80	300	300
Maximum operating voltage	d.c	V	220	440	220	440
Rated insulation voltage According to IEC 60664-1	d.c	V	690	690	690	690
Making capacity	d.c	A	1600	1600	4000	4000
Breaking capacity	d.c L/R = 15 ms	A	240	240	900	900
Overlap time with the N/C pole		ms	2	2	2	2
N/C pole						
Rated current	$\theta \leq 40^{\circ}\text{C}$	A	80	80	300	300
Making capacity	d.c	A	1600	1600	4000	4000
Breaking capacity	d.c L/R = 15 ms	A	0	0	0	0
Permissible current	For 10 s	A	480	480	1400	1400



**CVXB, CRXB and CWXB contactors composition:**

- 1 to 3 N/O poles with magnetic blow-out (80...2750 A)
- 1 N/C pole without blow-out, overlapping contacts (possible mounting of a blow-out device)
- 1 electromagnet with d.c supply
  - or with economy resistor (CVXB)
  - either with magnetic latching (CRXB)
  - either with mechanical latching (CWXB)
- 1 ZC4GM auxiliary contact or 1 or 2 instantaneous auxiliary contacts (3 to 6 N/O contacts + 2 to 4 N/C contacts)
- 1 mounting bar, 1 rotary drive shaft.

The following can be added:

- 1 or 2 blocks of 4 instantaneous auxiliary contacts type LADN●●, without increasing the overall size of the contactor.
- or 1 time delay block type LADT● or LADR●.

**Note:** it is not possible to fit a mechanical latch block type LA6DK●● on these contactors.

Characteristics									
Size of contactors C●XB <sup>(1)</sup>			F			H			
N/O pole			1 pole	2 poles	3 poles	1 pole	2 poles	3 poles	
Rated current	$\theta \leq 40^\circ\text{C}$	A	80	80	80	300	300	300	
Maximum operating voltage		V DC	440	850	1000	440	850	1000	
Rated insulation voltage		V DC	1000	1000	1000	1000	1000	1000	
Making capacity		A	1400	1400	1400	3500	3500	3500	
Breaking capacity	For U max	A	500	500	500	1200	1200	1200	
Overlap time with the N/C pole		ms	2	2	2	2	2	2	
N/C pole									
Rated current	$\theta \leq 40^\circ\text{C}$	A	80	80	80	300	300	300	
Making capacity		A	1600	1600	1600	4000	4000	4000	
Breaking capacity		A	0	0	0	0	0	0	
Permissible current	For 10s	A	480	480	480	1400	1400	1400	




Characteristics									
Size of contactors C●XB			K			L			
N/O pole			1 pole	2 pole	3 poles	1 pole	2 pole	3 poles	
Rated current	$\theta \leq 40^\circ\text{C}$	A	630	630	630	800	800	800	
Maximum operating voltage		V DC	440	850	1000	440	850	1200	
Rated insulation voltage		V DC	1000	1000	1000	1500	1500	1500	
Making capacity		A	6500	6500	6500	14000	14000	14000	
Breaking capacity	For U max	A	2500	2500	2500	3200	3200	3200	
Overlap time with the N/C pole		ms	2	2	2	2	2	2	
N/C pole									
Rated current	$\theta \leq 40^\circ\text{C}$	A	630	630	630	630	630	630	
Making capacity		A	6500	6500	6500	6500	6500	6500	
Breaking capacity		A	0	0	0	0	0	0	
Permissible current	For 10s	A	3600	3600	3600	3600	3600	3600	




  

Characteristics										
Size of contactors C●XB			M			P			R	
N/O pole			1 pole	2 poles	3 poles	1 pole	2 poles	3 poles	1 pole	2 poles
Rated current	$\theta \leq 40^\circ\text{C}$	A	1250	1250	1250	2000	2000	2000	2750	2750
Maximum operating voltage		V DC	440	850	1200	440	850	1200	440	850
Rated insulation voltage		V DC	1500	1500	1500	1500	1500	1500	1500	1500
Making capacity		A	14000	14000	14000	21000	21000	21000	25000	25000
Breaking capacity	For U max	A	4400	4400	4400	7200	7200	7200	10000	10000
Overlap time with the N/C pole		ms	2	2	2	2	2	2	2	2
N/C pole										
Rated current	$\theta \leq 40^\circ\text{C}$	A	630	630	630	630	630	630	630	630
Making capacity		A	6500	6500	6500	6500	6500	6500	6500	6500
Breaking capacity		A	0	0	0	0	0	0	0	0
Permissible current	For 10s	A	3600	3600	3600	3600	3600	3600	3600	3600

(1) CRX, CVXB legacy size 'G', 'J'. Please consult us.



CVEB, CWEB contactors equipped with type 1 (PN1) N/O poles									
Control circuit					With economy resistor		With mechanical latching		Scheme
Operational voltage	Number of poles N/O	Number of poles N/C	Instantaneous auxiliary contacts <sup>(2)</sup>	Rated operational current	Basic reference to be completed by adding the code of the blow-out coils <sup>(1)</sup> , of the control voltage <sup>(2)</sup> and of the aux. contacts <sup>(3)</sup>	Basic reference to be completed by adding the code of the blow-out coils <sup>(1)</sup> , of the control voltage <sup>(2)</sup> and of the aux. contacts <sup>(3)</sup>			
									
V				A					
220V DC	1	1	1, 3 or 6	1, 2 or 4	80	CVEBF1●1●●●●	CWEBF1●1●●●●	1	
					200	CVEBG1●1●●●●	CWEBG1●1●●●●	1	
					300	CVEBH1●1●●●●	CWEBH1●1●●●●	1	
440V DC	2	1	1, 3 or 6	1, 2 or 4	80	CVEBF2●1●●●●	CWEBF2●1●●●●	2	
					200	CVEBG2●1●●●●	CWEBG2●1●●●●	2	
					300	CVEBH2●1●●●●	CWEBH2●1●●●●	2	

CVX B, CWX B and CRX B contactors equipped with N/O poles type PA3 (F to H), PN3 (J and K) or PA1 (L to R)									
Control circuit					Economy resistor	Mechanical latching	Magnetic latching	Scheme	
Operational voltage	Number of poles N/O	Number of poles N/C	Instantaneous auxiliary contacts <sup>(2)</sup>	Rated operational current	Basic reference to be completed by adding the code of the blow-out coils <sup>(1)</sup> , of the control voltage <sup>(2)</sup> and of the aux. contacts <sup>(3)</sup>	Basic reference to be completed by adding the code of the blow-out coils <sup>(1)</sup> , of the control voltage <sup>(2)</sup> and of the aux. contacts <sup>(3)</sup>	Basic reference to be completed by adding the code of the blow-out coils <sup>(1)</sup> , of the control voltage <sup>(2)</sup> and of the aux. contacts <sup>(3)</sup>		
									
V				A					
440V DC	1	1	1, 3 or 6	1, 2 or 4	80	CVXBF1●1●●●●	CWVBF1●1●●●●	CRVBF1●1●●●●	1
					300	CVXBH1●1●●●●	CWVBH1●1●●●●	CRVBH1●1●●●●	1
					630	CVXBF1●1●●●●	CWVBF1●1●●●●	CRVBF1●1●●●●	1
					800	CVXBL1●1●●●●	CWVBL1●1●●●●	CRVBL1●1●●●●	1
					1250	CVXBM1●1●●●●	CWVBM1●1●●●●	CRVBM1●1●●●●	1
					2000	CVXBP1●1●●●●	CWVBP1●1●●●●	CRVBP1●1●●●●	1
					2750	CVXBR1●1●●●●	CWVBR1●1●●●●	CRVBR1●1●●●●	1
850V DC	2	1	1, 3 or 6	1, 2 or 4	80	CVXBF2●1●●●●	CWVBF2●1●●●●	CRVBF2●1●●●●	2
					300	CVXBH2●1●●●●	CWVBH2●1●●●●	CRVBH2●1●●●●	2
					630	CVXBF2●1●●●●	CWVBF2●1●●●●	CRVBF2●1●●●●	2
					800	CVXBL2●1●●●●	CWVBL2●1●●●●	CRVBL2●1●●●●	2
					1250	CVXBM2●1●●●●	CWVBM2●1●●●●	CRVBM2●1●●●●	2
					2000	CVXBP2●1●●●●	CWVBP2●1●●●●	CRVBP2●1●●●●	2
					2750	CVXBR2●1●●●●	CWVBR2●1●●●●	CRVBR2●1●●●●	2
1000V DC	3	1	1, 3 or 6	1, 2 or 4	80	CVXBF3●1●●●●	CWVBF3●1●●●●	CRVBF3●1●●●●	3
					300	CVXBH3●1●●●●	CWVBH3●1●●●●	CRVBH3●1●●●●	3
					630	CVXBF3●1●●●●	CWVBF3●1●●●●	CRVBF3●1●●●●	3
1200V DC	3	1	1, 3 or 6	1, 2 or 4	800	CVXBL3●1●●●●	CWVBL3●1●●●●	CRVBL3●1●●●●	3
					1250	CVXBM3●1●●●●	CWVBM3●1●●●●	CRVBM3●1●●●●	3
					2000	CVXBP3●1●●●●	CWVBP3●1●●●●	CRVBP3●1●●●●	3
					2750	CVXBR3●1●●●●	CWVBR3●1●●●●	CRVBR3●1●●●●	3

(1) For the codes of the blow-out coils, please refer next page.

(2) Existing control voltages (other voltages, please consult us).

Volts	24	48	110	125	220	230	240	250
DC	BD *	ED *	FD	GD	MD	PD	-	UD
AC	B7 *	E7 *	F7	G7	M7	P7	U7	-

★ K to R rating: please consult us.

(3) 1 auxiliary contact type ZC4GM1 (code 1) or 1 auxiliary contact type ZC4GM2 (code 2)  
or 1 auxiliary contacts block type LA1BN32 (3 N/O contacts + 2 N/C contacts) (code A)  
or 2 auxiliary contacts blocks type LA1BN32 (6 N/O contacts + 4 N/C contacts) (code B).







**CR1B Magnetic latching contactors introduction**

The magnetic latching contactors are equipped with a specific electromagnet allowing them to maintain position "ON" although the coil is fed by any current.

**Use**

The specific properties of magnetic latching contactors make them suitable for many uses:

Properties	Use
Memory retention of the sequence in automatic equipment, in the event of loss of the control voltage.	Refineries, power plants, excitation circuits.
Energy saving, as no current is drained when the contactor is activated.	Contactor staying activated for long periods. Examples: refineries, alimentation energy, ST distribution.
Change of state "Work" / "Rest" by current pulse sent to the coil.	Selective opening control.
Insensitivity to main perturbations.	No unexpected opening or closing of power poles
Use of contactors beyond breaking capacity as they are activated off-load.	Passer diverter, for use with 1000 V
Silent contactor when locked in ON position	

**Electro-magnet operation of the CR1B contactors**

The CR1B magnetic latching contactors are equipped with a single coil, supplied with direct current or alternating current through a rectifier.

The latching is obtained by direct feeding of the coil with a current in a given direction. The unlatching is produced by a current of opposite direction, adjusted by resistors.

**Range**

- The magnetic latching contactors are available from 80 to 630 A (Size F to K).
- The characteristics of N/O and N/C poles are identical to those of CV1 and CV3B (Size F to K).
- For other characteristics and mounting dimensions, please contact us.
- For ratings of 800 to 2750 A, see next page.



### Selection criteria of contactors for rotor starting motors

In simple starting systems the contactors which short-circuit the rotor current are subjected to a static voltage, the value of which, decreasing with time, is lower the further away the contactors are located from the rotor terminals. As a result, the operational rotor voltage is deducted from the maximum operational voltage. In this way, it is possible to use contactors with a rated insulation voltage lower than the rotor voltage.

In this application, making and breaking are easy. The selection table below takes into account a ratio of 2 between the maximum rotor operational voltage ( $U_{er}$ ) and the stator operational voltage ( $U_{es}$ ). This ratio is proposed in starter standard IEC 60947-4.

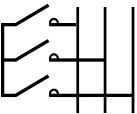
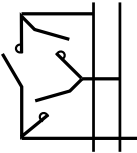
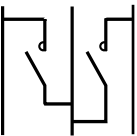
With counter current braking, the rotor operational voltage will be equal to the insulation voltage.

In a system with slowdown or braking, the selection of the contactors concerned should, in addition, take into account the breaking conditions.

The use of magnetic blow-out contactors is recommended in the event of control by a manually operated master controller.

### Multiplying factor for rotor voltage and current, depending on type of contactor connection

As far as the current flowing through a rotor circuit contactor is concerned, the short time rating should be taken into account according to the starting time. Only the final rotor short-circuit contactor takes account of the continuous current.

Type of connection	Circuit diagram	I rotor I operational	Maximum 3-phase rotor voltage $U_e$ V	3-phase rotor voltage $U_e$ with counter- current braking V	Contactor type
Star		1	1320	660	CV1B
		1	2000	1000	CV3B LC1B
Delta		1,4	1100	550	CV1B
		1,4	1700	850	CV3B LC1B
V		1	1100	550	CV1B
		1	1700	850	CV3B LC1B

### Hoisting applications

For this type of application contactor selection is made according to the duty requirements, required durability, type of connection, etc.  
Please consult your Regional Sales Office.

### Other versions:

For rotor voltage above 3000 V ~, please consult your Regional Sales Office.



### Contactors for furnaces and induction heating applications (CE1 - CS1, CE5 - CE6, CS5 - CS6)

Induction heating covers all applications where metals (or a metal part) are heated in crucible or "channel" furnaces, or in dies, by the induction of a.c. currents at various frequencies.

There are several frequency ranges which, for industrial purposes, can be grouped as follows:

- 50 Hz to 400 Hz:
  - industrial mains power frequencies from 50 to 250 Hz
  - intermediate frequencies of 350 Hz and 400 Hz.
- Maximum operating limits for contactors (single-pole and 6-pole):
  - frequency range up to 500 Hz
  - supply voltage up to 3000 V
  - currents up to 2750 A.

Please refer to our "Contactors for furnaces and induction heating applications" catalogue.

### Contactor for the grounding of supply rail tram (CV1BKS)

Designed for networks up to 1000 V DC (high closing capacity up to 43 kA) to ensure the grounding of the rail when it loses power.

But also under fault condition in the event that the rail remains supplied after the passage of the tram.

View the application form CV1BKS on the site: [www.se.com](http://www.se.com).



Download the configuration software "bar contactor soft-customer.xls" on:

<https://www.se.com/ww/en/product-range-download/667-tesys-b/#/software-firmware-tab>

Date of order	Editor	Geog. area	Order n°	Required delivery <sup>(1)</sup>	Job n°
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Company: .....			Customer Order N°: .....		
Activity sector: .....			Application: .....		

Number of contactors: ..... Type - size or symbol combination: ..... For devices with symbol combination: Do not fill out the form below		For use by Schneider Electric
Voltage: ..... V AC <input type="checkbox"/> ..... Hz DC <input type="checkbox"/> Number of N/O main poles: ..... Rated current: ..... Amp Number of N/C main poles: ..... Rated current: ..... Amp Any special details: .....		<b>Poles</b>  Ref: ..... Ref: .....
Voltage: ..... V AC <input type="checkbox"/> ..... Hz DC <input type="checkbox"/> Economy resistor: <input type="checkbox"/> Yes <input type="checkbox"/> No (unless specified, an economy resistor will only be included if necessary) For alternative control, in direct latching contact: <input type="checkbox"/> Yes <input type="checkbox"/> No Customer marking: .....		Electromag: ..... Coil: ..... Coil maint. cont: ..... Rectifier: ..... Econ. resist. contact: ..... Econ. Resist.: .....
Instantaneous contacts: ..... Number of N/O ..... Number of N/C ..... If a specific type or block of contacts is required, please indicate below. Number GM1: <input type="text"/> GM2: <input type="text"/> GP4: <input type="text"/> GP5: <input type="text"/> GP6: <input type="text"/> LA1: <input type="text"/> Note: For mechanical interlocking, a N/C contact must be specified for the interlocking function. Time delay contacts N/C + N/O: ..... On delay <input type="checkbox"/> or Off delay <input type="checkbox"/> Note: If LA1 is used, a build specification is required.		No. ZC4GM1 : (N/O) No. ZC4GM2 : (N/C) No. ZC1GP4 : (N/C) No. ZC1GP5 : (N/C+N/O) No. ZC1GP6 : (N/O+N/O) No. ZC2GG1 : (ON-Del) No. ZC2GG5 : (OFF-Del) No. LA1BN●31 : ..... No. LA1DN●● : ..... No. LA●DT● : ..... If CV1, specif. n°: .....
Fixing centres L: Standard <input type="checkbox"/> Specified <input type="checkbox"/> With L = ..... Mechanical interlock "MI": Yes <input type="checkbox"/> No <input type="checkbox"/> Vertically mounted reversers fixing centres "E" = ..... mm Upper position contactor: ..... Lower position contactor: ..... If mechanical interlock specified : Ref: ..... Supply linking components for the 2 contactors (Rod, clevis, cranks, lock, etc...): Yes <input type="checkbox"/> No <input type="checkbox"/> Note: "MI" components that are part of the contactor such as the bearing, clevis or lock support are factory fitted.		Shaft: C or E = ..... Code.: ..... Bar: L = : ..... Code.: ..... Build see drwg. N° : ..... "MI" bearing W1 ..... "MI" ref .....
(Comments / Specific requirements / Special "MI" / Accessories / Etc...)		Launch date <input type="text"/> Delivery date <input type="text"/> Contactor reference* ..... * 3 possibilities 1) Device with symbol combination (see drwg 1492177) 2) Device n° defined on the basis of this form Type/size/order n°/year. E.g.: CV1GB000599 3) Reference defined to "specification"

(1) Standard delivery time: 3 weeks, from receipt of order. For faster delivery, please consult your Regional Sales Office.



Bar  
mounted  
contactors

B10/44

Life | s On

**Schneider**  
Electric



Thermal overload relays - For use with <b>TeSys K</b> contactors			
Type of product	Range		Pages
Adjustable thermal overload relays For motors TeSys LRK	From 0.16 to 16 A		B11/2
Adjustable thermal overload relays For unbalanced loads TeSys LRK	From 0.8 to 16 A		B11/3
Thermal overload relays Class 10 A - For use with <b>TeSys D</b> contactors			
Adjustable thermal overload relays For motors TeSys LRD	From 0.16 to 140 A		B11/4
Adjustable thermal overload relays For unbalanced loads TeSys LRD	From 0.16 to 140 A		B11/4
Thermal overload relays Class 20 - For use with <b>TeSys D</b> contactors			
Adjustable thermal overload relays For motors TeSys LRD	From 0.63 to 80 A		B11/6
Adjustable thermal overload relays For unbalanced loads TeSys LRD	From 0.63 to 32 A		B11/6
Electronic thermal overload relays - For use with <b>TeSys D</b> contactors			
Adjustable electronic overload relay, Multi-class, multi-scale TeSys LR9D	From 0.1 to 150 A		B11/10
Electronic thermal overload relays - For use with <b>TeSys F</b> contactors			
Compensated and differential overload relays, with or without alarm TeSys LR9F	From 50 to 630 A		B11/11
Single pole magnetic over current relays			
Latching or non latching overload relays TeSys RM1	From 1.15 to 630 A		B11/15
Thermistor-type protection units – For use detection of motor overheating			
Protection units and PTC probes, with or without fault memory TeSys LT3	From 90 to 170 °C		B11/17
Electronic over current relays - For machine protection			
Predefined or adjustable starting times, Manual reset	From 1.5 to 34 A		B11/19
Automatic, electric or manual reset	From 0.5 to 50 A		B11/19





### 3-pole thermal overload relays for TeSys K contactors

These overload relays are designed for the protection of motors. They are compensated and phase failure sensitive. Resetting can either be manual or automatic.

Direct mounting: under the contactor for versions with screw clamp terminals only; pre-wired terminals, see pages B11/28 and B11/30.

Separate mounting: using terminal block LA7K0064 (see below).

On the front face of the overload relay:

- selection of reset mode: Manual (marked H) or Automatic (marked A),
- red pushbutton: Trip Test function,
- blue pushbutton: Stop and manual Reset,
- yellow trip flag indicator: overload relay tripped.

Protection by magnetic circuit breaker GV2LE, see pages coordination tables chapter A6.

### Class 10 A (the standard specifies a tripping time of between 2 and 10 seconds at 7.2 In)

Relay setting range	Fuses to be used with selected relay			Reference
	Maximum rating	Type		
	aM	gG	BS88	
A	A	A	A	
0.11...0.16	0.25	0.5	–	LR2K0301
0.16...0.23	0.25	0.5	–	LR2K0302
0.23...0.36	0.5	1	–	LR2K0303
0.36...0.54	1	1.6	–	LR2K0304
0.54...0.8	1	2	–	LR2K0305
0.8...1.2	2	4	6	LR2K0306
1.2...1.8	2	6	6	LR2K0307
1.8...2.6	4	8	10	LR2K0308
2.6...3.7	4	10	16	LR2K0310
3.7...5.5	6	16	16	LR2K0312
5.5...8	8	20	20	LR2K0314
8...11.5	10	25	20	LR2K0316
10...14	16	32	25	LR2K0321
12...16	20	40	32	LR2K0322

### Overload relays for unbalanced loads

**Class 10 A:** to order, replace the prefix **LR2** by **LR7** in the references selected from above (only applicable to overload relays **LR2K0305** to **LR2K0322**).

Example: **LR7K0308**.



**TeSys**  
**TeSys** accessory for LRK Thermal overload relays  
Product references



PS121488.eps

LA7K0064

Accessory for TeSys LRK Thermal overload relay		
Description	Type of connection	Reference
Terminal block for separate clip-on mounting of the overload relay on 35 mm rail	Screw clamp	LA7K0064





LRD01



LRD30



LRD33



LRD43



LRD306

### 3-pole differential thermal overload relays for TeSys D contactors - Class 10

- for use with fuses or magnetic circuit breakers GV2L and GV3L
- compensated relays with manual or automatic reset
- with relay trip indicator
- for a.c. or d.c.

Relay setting range (A)	Fuses to be used with selected relay			For use with contactor LC1	Reference	Weight kg
	aM (A)	gG (A)	BS88 (A)			
<b>Class 10 A <sup>(1)</sup> for connection by screw clamp terminals or connectors</b>						
0.10...0.16	0.25	2	–	D09...D38	<b>LRD01</b>	0.124
0.16...0.25	0.5	2	–	D09...D38	<b>LRD02</b>	0.124
0.25...0.40	1	2	–	D09...D38	<b>LRD03</b>	0.124
0.40...0.63	1	2	–	D09...D38	<b>LRD04</b>	0.124
0.63...1	2	4	–	D09...D38	<b>LRD05</b>	0.124
1...1.6	2	4	6	D09...D38	<b>LRD06</b>	0.124
1.6...2.5	4	6	10	D09...D38	<b>LRD07</b>	0.124
2.5...4	6	10	16	D09...D38	<b>LRD08</b>	0.124
4...6	8	16	16	D09...D38	<b>LRD10</b>	0.124
5.5...8	12	20	20	D09...D38	<b>LRD12</b>	0.124
7...10	12	20	20	D09...D38	<b>LRD14</b>	0.124
9...13	16	25	25	D12...D38	<b>LRD16</b>	0.124
12...18	20	35	32	D18...D38	<b>LRD21</b>	0.124
16...24	25	50	50	D25...D38	<b>LRD22</b>	0.124
23...32	40	63	63	D25...D38	<b>LRD32</b>	0.124
30...38	40	80	80	D32 and D38	<b>LRD35</b>	0.124
<b>Class 10 A <sup>(1)</sup> for connection by EverLink® BTR screw connectors <sup>(2)</sup></b>						
9...13	16	25	25	D40A...D65A	<b>LRD313</b>	0.375
12...18	20	32	35	D40A...D65A	<b>LRD318</b>	0.375
17...25	25	50	50	D40A...D65A	<b>LRD325</b>	0.375
23...32	40	63	63	D40A...D65A	<b>LRD332</b>	0.375
30...40	40	80	80	D40A...D65A	<b>LRD340</b>	0.375
37...50	63	100	100	D40A...D65A	<b>LRD350</b>	0.375
48...65	63	100	100	D50A and D65A	<b>LRD365</b>	0.375
62...80	80	125	125	D80A	<b>LRD380</b>	0.375
<b>Class 10 A <sup>(1)</sup> for connection by screw clamp terminals or connectors</b>						
17...25	25	50	50	D80 and D95	<b>LRD3322</b>	0.510
23...32	40	63	63	D80 and D95	<b>LRD3353</b>	0.510
30...40	40	100	80	D80 and D95	<b>LRD3355</b>	0.510
37...50	63	100	100	D80 and D95	<b>LRD3357</b>	0.510
48...65	63	100	100	D80 and D95	<b>LRD3359</b>	0.510
55...70	80	125	125	D80 and D95	<b>LRD3361</b>	0.510
63...80	80	125	125	D80 and D95	<b>LRD3363</b>	0.510
80...104	100	160	160	D80 and D95	<b>LRD3365</b>	0.510
80...104	125	200	160	D115 and D150	<b>LRD4365</b>	0.900
95...120	125	200	200	D115 and D150	<b>LRD4367</b>	0.900
110...140	160	250	200	D150	<b>LRD4369</b>	0.900
80...104	100	160	160	(3)	<b>LRD33656</b>	1.000
95...120	125	200	200	(3)	<b>LRD33676</b>	1.000
110...140	160	250	200	(3)	<b>LRD33696</b>	1.000
<b>Class 10 A <sup>(1)</sup> for connection by lugs</b>						

Select the appropriate overload relay with screw clamp terminals or connectors from the table above and add one of the following suffixes:

- figure 6 for relays LRD01 to LRD35 and relays LRD313 to LRD380.
- **A66** for relays LRD3322 to LRD3363.

Relays LRD4300 are suitable, as standard, for use with lug-clamps.

### Thermal overload relays for use with unbalanced loads

#### Class 10 A <sup>(1)</sup> for connection by screw clamp terminals or lugs

In the references selected above, change the prefix **LRD** (except **LRD4300**) to **LR3D**.

Example: **LRD01** becomes **LR3D01**.

Example with EverLink® connectors: **LRD340** becomes **LR3D340**.

Example with lugs: **LRD3406** becomes **LR3D3406**.

(1) Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current  $I_r$ : class 10 A: between 2 and 10 seconds.

(2) BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).

(3) Independent mounting of the contactor.





LRD003

### 3-pole differential thermal overload relays for TeSys D contactors - Class 10 A

- for use with fuses or magnetic circuit breakers GV2L and GV3L
- compensated relays with manual or automatic reset
- with relay trip indicator
- for a.c. or d.c.

Relay setting range (A)	Fuses to be used with selected relay			For use with contactor LC1	Reference
	aM (A)	gG (A)	BS88 (A)		
<b>Classes 10 A <sup>(1)</sup> for connection by spring terminals (only for direct mounting beneath the contactor)</b>					
0.10...0.16	0.25	2	–	D09...D38	<b>LRD013</b>
0.16...0.25	0.5	2	–	D09...D38	<b>LRD023</b>
0.25...0.40	1	2	–	D09...D38	<b>LRD033</b>
0.40...0.63	1	2	–	D09...D38	<b>LRD043</b>
0.63...1	2	4	–	D09...D38	<b>LRD053</b>
1...1.6	2	4	6	D09...D38	<b>LRD063</b>
1.6...2.5	4	6	10	D09...D38	<b>LRD073</b>
2.5...4	6	10	16	D09...D38	<b>LRD083</b>
4...6	8	16	16	D09...D38	<b>LRD103</b>
5.5...8	12	20	20	D09...D38	<b>LRD123</b>
7...10	12	20	20	D09...D38	<b>LRD143</b>
9...13	16	25	25	D12...D38	<b>LRD163</b>
12...18	20	35	32	D18...D38	<b>LRD213</b>
16...24	25	50	50	D25...D38	<b>LRD223</b>

### Class 10 A with connection by EverLink® BTR screw connectors <sup>(2)</sup> and control by spring terminals

9...13	16	25	25	D40A...D65A	<b>LRD3133</b>
12...18	20	32	35	D40A...D65A	<b>LRD3183</b>
17...25	25	50	50	D40A...D65A	<b>LRD3253</b>
23...32	40	63	63	D40A...D65A	<b>LRD3323</b>
30...40	40	80	80	D40A...D65A	<b>LRD3403</b>
37...50	63	100	100	D40A...D65A	<b>LRD3503</b>
48...65	63	100	100	D50A and D65A	<b>LRD3653</b>
62...80	80	125	125	D80A	<b>LRD3803</b>

### Thermal overload relays for use with unbalanced loads

#### Classes 10 A <sup>(1)</sup> for connection by BTR screw connectors <sup>(2)</sup> and control by spring terminals

In the references selected above, replace **LRD3** with **LR3D3**.  
Example: **LRD3653** becomes **LR3D3653**.

### Thermal overload relays for use on 1000 V supplies

#### Classes 10 A <sup>(1)</sup> for connection by screw clamp terminals

For relays LRD06 to LRD35 only, for an operating voltage of 1000 V, and only for independent mounting, the reference becomes **LRD33...A66**.  
Order an **LA7D3064** terminal block separately, see page B11/9.

Standard relay	Relay for 1000 V network
LRD06	LRD3306A66
LRD07	LRD3307A66
LRD08	LRD3308A66
LRD10	LRD3310A66
LRD12	LRD3312A66
LRD14	LRD3314A66
LRD16	LRD3316A66
LRD21	LRD3321A66
LRD22	LRD3322A66
LRD32	LRD3353A66
LRD35	LRD3355A66

<sup>(1)</sup> Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current  $I_R$ : class 10 A: between 2 and 10 seconds.

<sup>(2)</sup> BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).



# TeSys

## TeSys LRD Thermal overload relays

### Product references



LRD04L...LRD32L



LRD3...L



LR2D35...

### 3-pole differential thermal overload relays for TeSys D contactors - Class 20

- for use with fuses or magnetic circuit breakers GV2L and GV3L
- compensated relays with manual or automatic reset
- with relay trip indicator
- for a.c. or d.c.

Relay setting range (A)	Fuses to be used with selected relay			For use with contactor LC1	Reference
	aM (A)	gG (A)	BS88 (A)		
<b>Classes 20 <sup>(1)</sup> for connection by screw clamp terminals</b>					
0.4...0.63	1	2	-	D09...D38	<b>LRD04L</b>
0.63...1	2	4	-	D09...D38	<b>LRD05L</b>
1...1.6	2	4	6	D09...D38	<b>LRD06L</b>
1.6...2.5	4	6	10	D09...D38	<b>LRD07L</b>
2.5...4	6	10	16	D09...D38	<b>LRD08L</b>
4...6	8	16	16	D09...D38	<b>LRD10L</b>
5.5...8	12	20	20	D09...D38	<b>LRD12L</b>
7...10	12	20	20	D09...D38	<b>LRD14L</b>
9...13	16	25	25	D12...D38	<b>LRD16L</b>
12...18	20	35	32	D18...D38	<b>LRD21L</b>
17...24	25	50	50	D25...D38	<b>LRD22L</b>
23...32	40	63	63	D25...D38	<b>LRD32L</b>

### Class 20 <sup>(1)</sup> for connection by EverLink® BTR screw connectors <sup>(2)</sup>

9...13	20	32	35	D40A...D65A	<b>LRD313L</b>
12...18	25	40	40	D40A...D65A	<b>LRD318L</b>
17...25	32	50	50	D40A...D65A	<b>LRD325L</b>
23...32	40	63	63	D40A...D65A	<b>LRD332L</b>
30...40	50	80	80	D40A...D65A	<b>LRD340L</b>
37...50	63	100	100	D40A...D65A	<b>LRD350L</b>
48...65	80	125	125	D50A and D65A	<b>LRD365L</b>

### Classes 20 <sup>(1)</sup> for connection by screw clamp terminals

17...25	32	50	50	D80 and D95	<b>LR2D3522</b>
23...32	40	63	63	D80 and D95	<b>LR2D3553</b>
30...40	40	100	80	D80 and D95	<b>LR2D3555</b>
37...50	63	100	100	D80 and D95	<b>LR2D3557</b>
48...65	80	125	100	D80 and D95	<b>LR2D3559</b>
55...70	100	125	125	D80 and D95	<b>LR2D3561</b>
63...80	100	160	125	D80 and D95	<b>LR2D3563</b>

### Class 20 <sup>(1)</sup> for connection by lugs

For relays LRD04L to LRD32L and relays LRD313L to LRD365L, select the appropriate overload relay with screw clamp terminals or connectors from the table above and add the suffix **6**.

Example: **LRD04L** becomes **LRD04L6**.

### Thermal overload relays for use with unbalanced loads

#### Class 20 <sup>(1)</sup> for connection by screw clamp terminals or lugs

For relays LRD04L to LRD32L and relays LR2D3522 to LR2D3563, select the appropriate overload relay with screw clamp terminals or connectors from the table above and change the prefix LRD or LR2D to **LR3D**.

Example: **LRD04L** becomes **LR3D04L**.

<sup>(1)</sup> Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current  $I_R$ :  
class 20: between 6 and 20 seconds

<sup>(2)</sup> BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).



### 3-pole differential thermal overload relays for TeSys D contactors - Class 20

- for use with fuses or magnetic circuit breakers GV2L and GV3L
- compensated relays with manual or automatic reset
- with relay trip indicator
- for a.c. or d.c.

Relay setting range (A)	Fuses to be used with selected relay			For mounting beneath contactor LC1	Reference
	aM (A)	gG (A)	BS88 (A)		
Class 20 <sup>(1)</sup> with connection by EverLink® BTR screw connectors <sup>(2)</sup> and control by spring terminals					
9...13	20	32	35	D40A...D65A	LRD313L3
12...18	25	40	40	D40A...D65A	LRD318L3
17...25	32	50	50	D40A...D65A	LRD325L3
23...32	40	63	63	D40A...D65A	LRD332L3
30...40	50	80	80	D40A...D65A	LRD340L3
37...50	63	100	100	D40A...D65A	LRD350L3
48...65	80	125	125	D50A and D65A	LRD365L3

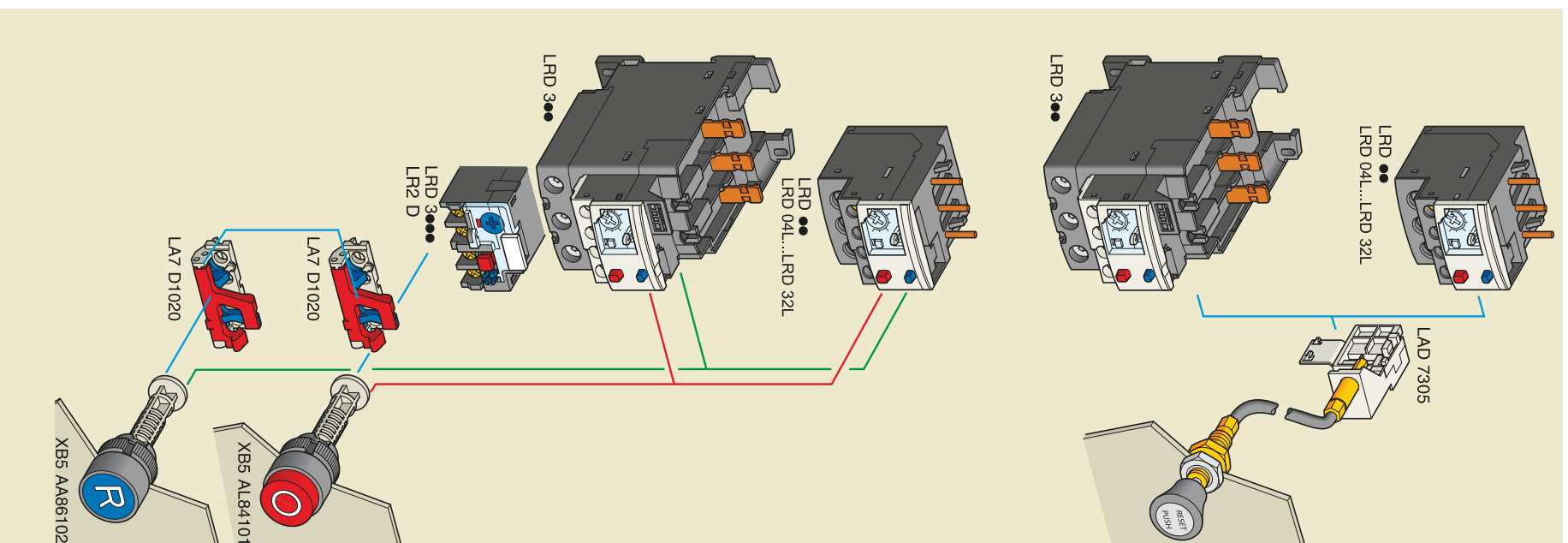
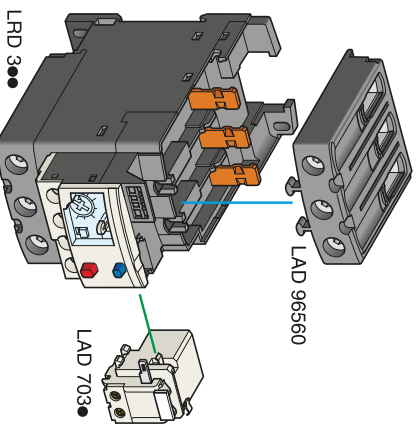
<sup>(1)</sup> Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current  $I_R$ :

class 10: between 4 and 10 seconds,  
class 10 A: between 2 and 10 seconds,  
class 20: between 6 and 20 seconds.

<sup>(2)</sup> BTR screws: hexagon socket head. In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).









DF537620 eps

PB121510 eps

LAD7C●

DF537621 eps

PB121511 eps

LAD7B106

DF536606 eps

LAD96570

PB121512 eps

PB121513 eps

LAD96570

LAD96575

### Separate components for relays

Description	For use with	Sold in lots of	Unit reference
Pre-wiring kit allowing direct connection of the N/C contact of relay LRD01...35 or LR3D01...D35 to the contactor	LC1D09...D18 LC1D25...D38	10 10	LAD7C1 <sup>(1)</sup> LAD7C2 <sup>(1)</sup>
Terminal block <sup>(2)</sup> for clip-on mounting on 35 mm rail (AM1DP200) or screw fixing; for fixing centres, see pages B11/35 to B11/37	LRD01...35 and LR3D01...D35 LRD04L...LRD32L, LR3D04L...LR3D32L LRD33●●, LR3D33●●, LR2D35●●, LR3D35●●	1 1 1	LAD7B106 LAD7B205 LA7D3064 <sup>(3)</sup>
EverLink® terminal block for independent mounting	LRD3●●, LR3D3●●L and LR3D3●●	1	LAD96560
Size 4 Allen key, insulated, 1000 V	LRD3●●, LR3D3●●L and LR3D3●●	5	LADALLEN4
Terminal block adapter for mounting a relay beneath an LC1D115 or D150 contactor	LRD33●●, LR3D33●●, LR3D35●●	1	LA7D3058 <sup>(3)</sup>
Mounting plates <sup>(4)</sup> for screw fixing on 110 mm centres	LRD01...35, LR3D01...D35, LRD04L...LRD32L, LR3D04L...LR3D32L LRD3●●●, LR3D3●●●, LR2D35●●	10 1	DX1AP25 LA7D902
Marker holders, snap-in 8 x 18 mm	LRD3●● All relays except LRD01...35, LRD04L...32L, LR3D04L...D32L LR3D01...D35, LR3D3●●, LR3D3●●L and LR3D3●●	100 100	LAD90 LA7D903
Bag of 400 blank legends (self-adhesive, 7 x 16 mm)	All relays	1	LA9D91
Stop button locking device	All relays except LRD01...35, LRD04L...32L, LR3D04L...D32L LR3D01...D35, LR9 D and LR3D13...LRD380	10	LA7D901
Remote Stop or electrical reset device <sup>(5)</sup>	LRD01...35, LR3D01...D35, LRD04L...32L, LR3D04L...D32L and LR3D13...LRD380	1	LAD703● <sup>(6) (7)</sup>
Remote tripping or electrical reset device <sup>(5)</sup>	All relays except LRD01...35, LR9D01...32, LRD04L...32L, LR3D04L...D32L, LR3D01...D35, LR9D01...32, LR3D3●●, LR3D3●●L and LR3D3●●	1	LA7D03● <sup>(6)</sup>
Block of insulated terminals	LR9D	2	LA9F103 <sup>(7)</sup>
IP 20 cover for lug type terminals for independent mounting	LRD3136...3806	1	LAD96570
IP 20 cover for lug type terminals for mounting with contactor LC1D40A6...D65A6	LRD3136...3806	1	LAD96575
Terminal block for lug type terminals for independent mounting	LRD3136...3806	1	LAD96566

### Remote control

#### "Reset" function

Description	For use with	Sold in lots of	Unit reference
By flexible cable (length = 0.5 m)	LRD01...35, LR3D01...D35, LR3D04L...D32L and LR3D13...LRD380, LRD04L...LRD32L	1	LAD7305 <sup>(8)</sup>
	All relays except LRD01...35, LR3D01...D35, LR3D3●●, LRD04L...32L, LR3D04L...D32L, LR3D3●●L, LR3D3●●, LR9D01, LR9D110S	1	LA7D305

#### "Stop" and/or "Reset" functions

The terminal protection shroud must be removed and the following 3 products must be ordered separately:

Adapter for door mounting	LRD33●●, LR2D		1	LA7D1020
Operating heads for spring return pushbutton	Stop	All relays	1	XB5AL84101
	Reset	All relays	1	XB5AA86102

<sup>(1)</sup> These pre-wiring kits cannot be used with reversing contactors.

<sup>(2)</sup> Terminal blocks are supplied with terminals protected against direct finger contact and screws in the open, "ready-to-tighten" position.

<sup>(3)</sup> To order a terminal block for connection by lugs, the reference becomes LA7D3064.

<sup>(4)</sup> Remember to order the terminal block corresponding to the type of relay.

<sup>(5)</sup> The time for which the coil of remote tripping or electrical resetting device LA7D03 or LAD703 can remain energised depends on its rest time: 1 s pulse duration with 9 s rest time; 5 s pulse duration with 30 s rest time; 10 s pulse duration with 90 s rest time; maximum pulse duration 20 s with a rest time of 300 s. Minimum pulse time: 200 ms.

<sup>(6)</sup> Reference to be completed by adding the code indicating the control circuit voltage.

Standard control circuit voltages (for other voltages, please consult your Regional Sales Office):

Volts	12	24	48	96	110	220/230	380/400	415/440
50/60 Hz	—	B	E	—	F	M	Q	N
Consumption, inrush and sealed: < 100 VA								
—	J	B	E	DD	F	M	—	—

Consumption, inrush and sealed: < 100 W.

<sup>(7)</sup> Only one terminal block can be mounted below LR9D.

<sup>(8)</sup> Not compatible with 3-pole relays fitted with spring terminals.



# TeSys

## TeSys LR9D Electronic thermal overload relays

### Product references



LR9D01 and LR9D32



LR9D110S



LR9D5567



LAD7B205



LAD7B205 mounted on LR9D01



LR9D67

#### Electronic thermal overload relays for TeSys D contactors

- for use with fuses or magnetic circuit breakers
- compensated relays, with relay trip indicator,
- for a.c.,
- for direct mounting on contactor or independent mounting <sup>(1)</sup>.

Relay setting range	Fuses to be used with selected relay		For direct mounting beneath contactor LC1	Reference
	aM	gG		

A A A

#### Classes 5.10.20.30 <sup>(1)</sup> selectable for direct connection on TeSys D contactors or connection using connectors

0.1...0.5			D09...D38	LR9D01
0.4...2			D09...D38	LR9D02
1.6...8			D09...D38	LR9D08
6.4...32			D09...D38	LR9D32

#### Classes 5.10.20.30 <sup>(1)</sup> selectable for connection using connectors

22...110				LR9D110S
----------	--	--	--	----------

#### Classes 10 or 10 A <sup>(1)</sup> for connection using bars or connectors

60...100	100	160	D115...D150	LR9D5367
90...150	160	250	D115...D150	LR9D5369

#### Classes 20 <sup>(1)</sup> for connection using bars or connectors

60...100	125	160	D115...D150	LR9D5567
90...150	200	250	D115...D150	LR9D5569

#### Separate components for relays

Description	For use with	Sold in lots of	Unit reference
Terminal block <sup>(2)</sup> For clips-on mounting on 35 mm rails (AM1DP200) or screws fixing; for fixing centres, see pages B11/35 to B11/37	LR9D01, LR9D02, LR9D08, LR9D32	1	LAD7B205

#### Electronic overload relays for balanced or unbalanced loads

Relay setting range	Fuses to be used with selected relay		For direct mounting beneath contactor LC1	Reference
	aM	gG		

A A A

#### Classes 10 or 20 <sup>(1)</sup> selectable for direct connection using bars or connectors

60...100	100	160	D115...D150	LR9D67
90...150	160	250	D115...D150	LR9D69

<sup>(1)</sup> Standard IEC 60947-4-1 specifies a tripping time for 7.2 times the setting current  $I_{Rc}$ :  
class 5: between 0.5 and 5 seconds  
class 10: between 4 and 10 seconds  
class 10 A: between 2 and 10 seconds  
class 20: between 6 and 20 seconds  
class 30: between 9 and 30 seconds.

<sup>(2)</sup> Terminal blocks are supplied with terminals protected against direct finger contact and screws in the open, "ready-to-tighten" position.

<sup>(3)</sup> Power terminals can be protected against direct finger contact by the addition of shrouds and/or insulated terminal blocks, to be ordered separately (see page B8/20).



# TeSys

## TeSys LR9F Electronic thermal overload relays

### Product references



LR9F53●●



LR9F73●●

#### Compensated and differential overload relays for TeSys F contactors

- with relay trip indicator,
- for a.c.,
- for direct mounting on contactor or independent mounting <sup>(1)</sup>.

Relay setting range	Fuses to be used with selected relay		For direct mounting beneath contactor LC1	Reference	Weight
	aM	gG			
A	A	A			kg
<b>Class 10 <sup>(2)</sup></b>					
30...50	50	80	F115...F185	LR9F5357	0.885
48...80	80	125	F115...F185	LR9F5363	0.900
60...100	100	200	F115...F185	LR9F5367	0.900
90...150	160	250	F115...F185	LR9F5369	0.885
132...220	250	315	F225...F265	LR9F5371	0.950
200...330	400	500	F225...F500	LR9F7375	2.320
300...500	500	800	F225...F500	LR9F7379	2.320
380...630	630	800	F400...F630 and F800	LR9F7381	4.160
<b>Class 20 <sup>(2)</sup></b>					
30...50	50	80	F115...F185	LR9F5557	0.885
48...80	80	125	F115...F185	LR9F5563	0.900
60...100	100	200	F115...F185	LR9F5567	0.900
90...150	160	250	F115...F185	LR9F5569	0.885
132...220	250	315	F225...F265	LR9F5571	0.950
200...330	400	500	F225...F500	LR9F7575	2.320
300...500	500	800	F225...F500	LR9F7579	2.320
380...630	630	800	F400...F630 and F800	LR9F7581	4.160

<sup>(1)</sup> When mounting overload relays **LR9F5●57...LR9F5●71** directly beneath the contactor, supporting the relays with a mounting plate is recommended (see page B11/14).  
With overload relays **LR9F7●75...LR9F7●81**, use of a support mounting plate is mandatory (see page B11/14).

Power terminals can be protected against direct finger contact by the addition of shrouds and/or insulated terminal blocks, to be ordered separately (see page B11/14).  
Interconnection kit **LA7F407** is required for mounting an **LR9F5●71** thermal overload relay together with an **LC1F185** contactor.

<sup>(2)</sup> Standard IEC 60947-4 specifies a tripping time for 7.2 times the setting current  $I_n$ :  
- class 10: between 4 and 10 seconds,  
- class 20: between 6 and 20 seconds.



# TeSys

## TeSys LR9F Electronic thermal overload relays

### Product references



LR9F57



#### Compensated overload relays for TeSys F contactors - class 10 or 20

- with relay trip indicator,
- for a.c.,
- for direct mounting on contactor or independent mounting <sup>(1)</sup>,
- class 10 or 20 by selector switch,
- protection of 3-phase or single-phase circuits by selector switch,
- with alarm function that enables tripping to be forestalled.

Relay setting range	Fuses to be used with selected relay		For direct mounting beneath contactor LC1	Reference	Weight
	aM	gG			
A	A	A			kg
30...50	50	80	F115...F185	<b>LR9F57</b>	0.885
48...80	80	125	F115...F185	<b>LR9F63</b>	0.900
60...100	100	200	F115...F185	<b>LR9F67</b>	0.900
90...150	160	250	F115...F185	<b>LR9F69</b>	0.885
132...220	250	315	F185...F265	<b>LR9F71</b>	0.950
200...330	400	500	F225...F500	<b>LR9F75</b>	2.320
300...500	500	800	F225...F500	<b>LR9F79</b>	2.320
380...630	630	800	F400...F630 and F800	<b>LR9F81</b>	4.160

<sup>(1)</sup> When mounting overload relays **LR9F57...LR9F71** directly beneath the contactor, supporting the relays with a mounting plate is recommended (see page B11/14).

With overload relays **LR9F75...LR9F81**, use of a support mounting plate is mandatory (see page B11/14).

Power terminals can be protected against direct finger contact by the addition of shrouds and/or insulated terminal blocks, to be ordered separately (see page B11/14).

Interconnection kit **LA7F407** is required for mounting an **LR9F71** thermal overload relay together with an **LC1F185** contactor.





LA7D03●



LA7D305

#### Control accessories

Description	Sold in lots of	Unit reference
Remote electrical reset device <sup>(1)</sup>	1	LA7D03● <sup>(2)</sup>
Remote Reset function control by flexible cable (length = 0.5 m)	1	LA7D305
Remote Stop and/or Reset function control	Adapter for door mounted operator	1 LA7D1020
	Rod (snap-off end to obtain required length, between 17 and 120 mm)	10 ZA2BZ13
	Operating head for spring return pushbutton	1 ZA2B●●● <sup>(3)</sup>

#### Connection accessories

##### For mounting an LR9F5●71 thermal overload relay together with an LC1 F185 contactor

Description	Reference
Set of 3 busbars	LA7F407

##### For mounting a thermal overload relay beneath a reversing contactor or star-delta contactors

Application	Width of terminal lug	Set of 3 busbars Reference
For relay	For contactor	
	mm	
LR9F5●57, F5●63, F5●67, F5●69, LR9F57, F63, F67, F69	15	LA7F401
LR9F5●57, F5●63, F5●67, F5●69, LR9F57, F63, F67, F69	20	LA7F402
LR9F5●71, LR9F71	25	LA7F407
LR9F5●71, LR9F71	25	LA7F403
LR9F7●75, F7●79, LR9F75, F79	25	LA7F404
LR9F7●81, LR9F81	25	LA7F404
LR9F7●75, F7●79, F7●81, LR9F75, F79, F81	30	LA7F405
LR9F7●81, LR9F81	40	LA7F406

(1) The time for which the coil of remote electrical reset device **LA7D03** can remain energised depends on its rest time: 1 s pulse duration with 9 s rest time; 5 s pulse duration with 30 s rest time; 10 s pulse duration with 90 s rest time. Maximum pulse duration of 20 s with rest time of 300 s. Minimum pulse time: 200 ms.

(2) Reference to be completed by adding the coil voltage code.  
Standard control circuit voltages,  
(for other voltages, please consult your Regional Sales Office):

Volts	12	24	48	96	110	220/230	380/400	415/440
~ 50/60 Hz	—	B	E	—	F	M	Q	N
Consumption, inrush and sealed: < 100 VA								
---	J	B	E	DD	F	M	—	—

Consumption, inrush and sealed: < 100 W.

(3) Stop: **ZA2BL432** and Reset: **ZA2BL639**.





LA7F90●



LA9F70●



LA7F70●



LA9F103

#### Mounting plates for overload relay

For use with relays	Reference
---------------------	-----------

LR9F5●57, F5●63, F5●67, F5●69, F5●71, LR9F57, F63, F67, F69, F71	LA7F901
--	---------

LR9F7●75, F7●79, F7●81, LR9F75, F79, F81	LA7F902
--	---------

#### Sets of power terminal protection shrouds, single-pole

For use with relays	Number of shrouds per set	Set reference
---------------------	---------------------------	---------------

LR9F5●57, LR9F57	6	LA9F701
------------------	---	---------

LR9F5●63, F5●67, F5●69, LR9F63, F67, F69	6	LA9F702
--	---	---------

LR9F5●71, LR9F71	6	LA9F705
------------------	---	---------

LR9F7●75, F7●79, F7●81, LR9F75, F79, F81	6	LA9F703
--	---	---------

#### Power terminal protection shrouds, 3-pole

For use with relays	Reference
---------------------	-----------

LR9F5●57, F5●63, F5●67, F5●69, LR9F57, F63, F67, F69	LA7F701
--	---------

LR9F5●71, LR9F71	LA7F702
------------------	---------

LR9F7●75, F7●79, F7●81, LR9F75, F79, F81	LA7F703
--	---------

#### Insulated terminal blocks

For use with relays	Set of 2 blocks Reference
---------------------	---------------------------

LR9F5●57, F5●63, F5●67, F5●69, LR9F57, F63, F67, F69	LA9F103
--	---------

#### Marking accessories

Description	Sold in lots of	Unit reference
-------------	-----------------	----------------

Clip-in marker holder	100	LA7D903
-----------------------	-----	---------

Bag of 400 blank self-adhesive legends 7 x 16 mm	1	LA9D91
--	---	--------



# TeSys

## TeSys RM1XA magnetic over current relays

### Product references



RM1XA●●●

Single-pole, non-latching, over current relays				
With 1 C/O contact block				
	Recommended operating range (motor I <sub>n</sub> )	Setting range (trip current)	Maximum continuous current ~ or ---	Reference
A	A	A	A	
~ or ---	0.7...1.15	1.25...4	1.6	RM1XA001
	1.16...1.8	2...6.3	2.5	RM1XA002
	1.9...2.9	3.2...10	4	RM1XA004
	3...4.6	5...16	6.3	RM1XA006
	4.7...7.2	8...25	10	RM1XA010
	7.3...11.5	12.5...40	16	RM1XA016
	11.6...18	20...63	25	RM1XA025
	18.1...29	32...100	40	RM1XA040
	29.1...46	50...160	63	RM1XA063
	46.1...72	80...250	100	RM1XA100
	73...115	125...400	160	RM1XA160
	116...145	160...500	200	RM1XA200
	146...230	250...800	315	RM1XA315
~	231...360	400 ...1250	500	RM1XA500
	361...630	630...2200	1000	RM1XA101
	631...570	630...2000	1000	RM1XA101
Accessories (to be ordered separately)				
Description				Reference
1 C/O contact block, non-latching				RM1ZG21



Overload relays



# TeSys

## TeSys RM1X magnetic over current relays

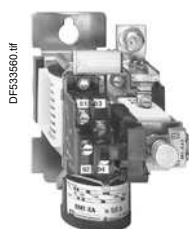
### Product references



RM1XA0011



ER1XA2●



ER1XA2●  
mounted on  
RM1XA1001



RM1ZH21



2 x RM1ZH21  
mounted on  
RM1XA0011

#### Single-pole, latching, manual reset, over current relays

##### With 1 C/O contact block

Recommended operating range (motor In)	Setting range (trip current)	Maximum continuous current ~ or ---	Reference	
A	A	A		
~ or ---	0.7...1.15	1.25...4	1.6	RM1XA0011
	1.16...1.8	2...6.3	2.5	RM1XA0021
	1.9...2.9	3.2...10	4	RM1XA0041
	3...4.6	5...16	6.3	RM1XA0061
	4.7...7.2	8...25	10	RM1XA0101
	7.3...11.5	12.5...40	16	RM1XA0161
	11.6...18	20...63	25	RM1XA0251
	18.1...29	32...100	40	RM1XA0401
	29.1...46	50...160	63	RM1XA0631
	46.1...72	80...250	100	RM1XA1001
	73...115	125...400	160	RM1XA1601
	116...145	160...500	200	RM1XA2001
	146...230	250...800	315	RM1XA3151
	231...360	400...1250	500	RM1XA5001
~	361...630	630...2200	1000	RM1XA1011
---	361...570	630...2000	1000	RM1XA1011

##### Accessories (to be ordered separately)

Description	Reference
1 C/O contact block, latching	RM1ZH21
Electrical reset <sup>(1)</sup> (consumption: inrush, sealed: 500 VA) (fitted to the relay together with a latching contact block) Basic reference. Complete with code indicating control circuit voltage <sup>(2)</sup>	ER1XA2●
<sup>(1)</sup> The impulse duration must not exceed 2 seconds within 10 minute intervals. <sup>(2)</sup> Standard coil voltages for electrical reset:	
<b>Volts</b>	<b>110</b> <b>220</b>
<b>50 Hz</b>	F              M



# TeSys

## TeSys LT3 Thermal protection units

### Product references



LT3SE00M



LT3SA00M



LT3SM00M

#### Protection units

- to be used with PTC thermistor probes
- with thermistor short-circuit detection
- The contact changes state when a rapid rise in temperature above the nominal probe rating is detected.

#### With automatic reset

Connection	Voltage		Output contact	Reference
Cage connectors	~ 50/60 Hz	115 V	N/C	LT3SE00F
		230 V	N/C	LT3SE00M
	---	24 V	N/C	LT3SE00BD

#### Units with automatic reset and front signalling by LED's (Power-Fault)

Connection	Voltage		Output contact	Reference
Cage connectors	~ 50/60 Hz	115/230 V	N/C + N/O	LT3SA00M
		---	N/C + N/O	LT3SA00ED
	~ 50/60 Hz or ---	24...230 V	2 C/O	LT3SA00MW

#### Manual reset, on front: Test/Reset pushbutton Power + Fault LED's

Connection	Voltage		Output contact	Reference
Cage connectors	~ 50/60 Hz	400 V	N/C + N/O	LT3SM00V
		24/48 V	N/C + N/O	LT3SM00E
		115/230 V	N/C + N/O	LT3SM00M
---	~ 50/60 Hz or ---	24/48 V	N/C + N/O	LT3SM00ED
		24...230 V	2 C/O	LT3SM00MW



Overload  
relays





DA1TT●●●



Triple probe to be inserted into equipment



DA1TS●●●



Probe to be screwed on equipment casing

## PTC thermistor probes

Description	Nominal Operating Temperature (NOT) °C	Colour	Sold in lots of	Unit reference
Integrated triple probes	90	Green/green	10	DA1TT090
	110	Brown/brown	10	DA1TT110
	120	Grey/grey	10	DA1TT120
	130	Blue/blue	10	DA1TT130
	140	White/blue	10	DA1TT140
	150	Black/black	10	DA1TT150
	160	Blue/red	10	DA1TT160
	170	White/green	10	DA1TT170
Surface probes	60	White/grey	10	DA1TS060
	70	White/brown	10	DA1TS070
	80	White/white	10	DA1TS080
	90	Green/green	10	DA1TS090
	100	Red/red	10	DA1TS100

## Accessories (to be ordered separately)

## Mounting accessories

Description	Applicationi	Sold in lots of	Unit reference
Adapter	For fixing on C rail DZ5 MB	10	RHZ66

## Marking accessories

Clip-in markers (maximum of 5 per unit)	Strips of 10 identical numbers (0 to 9)	25	AB1R● <sup>(2)</sup>
	Strips of 10 identical capital letters (A to Z)	25	AB1G● <sup>(2)</sup>

<sup>(1)</sup> PTC: Positive Temperature Coefficient.

<sup>(2)</sup> When ordering, replace the ● in the reference with the number or letter required.





LR97D07●●



LT4730●●●

## LR97D electronic over current relays

Relay setting range	Usable range (1)	For use with contactor (2)	Relay supply voltage	Reference (3)
<b>A</b>	<b>A</b>			
0.3...1.5	0.3...1.3	LC1 D09...D38	~ 200...240 V	LR97D015M7
			~ 100...120 V	LR97D015F7
			---/~ 24 V	LR97D015B
			---/~ 48 V	LR97D015E
1.2...7	1.2...6	LC1 D09...D38	~ 200...240 V	LR97D07M7
			~ 100...120 V	LR97D07F7
			---/~ 24 V	LR97D07B
			---/~ 48 V	LR97D07E
5...25	5...21	LC1 D09...D38	~ 200...240 V	LR97D25M7
			~ 100...120 V	LR97D25F7
			---/~ 24 V	LR97D25B
			---/~ 48 V	LR97D25E
20...38	20...34	LC1 D25...D38	~ 200...240 V	LR97D38M7
			~ 100...120 V	LR97D38F7
			---/~ 24 V	LR97D38B
			---/~ 48 V	LR97D38E

## LT47 electronic over current relays

Relay setting range	Usable range (1)	Relay supply voltage	Reference
A	A		
LT47 relay with manual/electric reset			
0.5...6	0.5...5	~ 200...240 V	LT4706M7S
		~ 100...120 V	LT4706F7S
		---/~ 24 V	LT4706BS
		---/~ 48 V	LT4706ES
3...30	3...25	~ 200...240 V	LT4730M7S
		~ 100...120 V	LT4730F7S
		---/~ 24 V	LT4730BS
		---/~ 48 V	LT4730ES
5...60	5...50	~ 200...240 V	LT4760M7S
		~ 100...120 V	LT4760F7S
		---/~ 24 V	LT4760BS
		---/~ 48 V	LT4760ES
LT47 relay with automatic reset			
0.5...6	0.5...5	~ 200...240 V	LT4706M7A
		~ 100...120 V	LT4706F7A
		---/~ 24 V	LT4706BA
		---/~ 48 V	LT4706EA
3...30	3...25	~ 200...240 V	LT4730M7A
		~ 100...120 V	LT4730F7A
		---/~ 24 V	LT4730BA
		---/~ 48 V	LT4730EA
5...60	5...50	~ 200...240 V	LT4760M7A
		~ 100...120 V	LT4760F7A
		---/~ 24 V	LT4760BA
		---/~ 48 V	LT4760EA

## Accessories (to be ordered separately)

Description	For use with	Sold in lots of	Unit reference
Pre-wiring kits allowing connection of the LR97D relay N/C contact directly to the contactor	LC1 D09...D18	10	LAD7C1
	LC1 D25...D38	10	LAD7C2
Terminal block for clip-on mounting on 35 mm rail (AM1 DP200)	LR97D	1	LAD7B106

(1) To allow adjustment of the tripping sensitivity, see adjustment method (page B11/58).

(2) Please see chapter B8.

(3) If a pre-wiring kit is used, it is no longer possible to electrically wire signalling of tripped status.



Overload  
relays

B11/20

Life is On

**Schneider**  
Electric



## Technical Data for Designers

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## Introduction

Exceeding the operating limits of an electric motor will lead, eventually, not only to destruction of the motor itself but also of the mechanisms it drives.

This type of load can be the cause of electrical or mechanical faults.

■ **Electrical faults:**

- overvoltage, voltage drop, imbalance and phase failure which cause variations in the current drawn,
- short-circuits which can cause the current to reach levels capable of destroying the load.

■ **Mechanical faults:**

- locked rotor,
- brief or prolonged overload which leads to an increase in the current drawn by the motor, and therefore overheating.

The cost of these faults must take into account loss of production, loss of raw materials, repair of the production tool, poor quality of production and delays in delivery.

These faults can also have dramatic consequences on the safety of persons in direct or indirect contact with the motor.

To prevent these faults, protection measures are necessary. They make it possible to isolate the equipment to be protected from the mains supply by measuring variations in electrical values (voltage, current, etc.).

**Each motor starter must therefore have:**

■ **short-circuit protection**, to detect and break, as quickly as possible, abnormal currents generally greater than 10 times the rated current ( $I_n$ ).

■ **overload protection**, to detect increases in current up to about  $10 I_n$  and switch off the starter before overheating of the motor and conductors damages the insulation.

This protection is provided by specific devices such as fuses, circuit breakers and thermal overload relays, or by more integrated devices offering several types of protection.



### Causes, effects and consequences of various faults

There are two types of fault:  
 ■ Internal faults within the motor  
 ■ External faults: these are located outside the electric motor but their consequences can lead to damage inside the motor.

Faults	Causes	Effects	Consequences on the motor and on the machine
Short-circuit	Contact between several phases, or between one phase and neutral or between several turns of the same phase.	<ul style="list-style-type: none"> <li>■ Current peak</li> <li>■ Electrodynamical forces on the conductors</li> </ul>	Destruction of windings
Overvoltage	<ul style="list-style-type: none"> <li>■ Lightning</li> <li>■ Electrostatic discharge</li> <li>■ Operation</li> </ul>	Dielectric breakdown in the windings	Destruction of the windings due to loss of insulation
Phase imbalance and phase failure	<ul style="list-style-type: none"> <li>■ Opening of a phase</li> <li>■ Single-phase load upstream of the motor</li> <li>■ Short-circuit between the turns of the same winding</li> </ul>	<ul style="list-style-type: none"> <li>■ Reduction of usable torque, efficiency and speed</li> <li>■ Increase in losses</li> <li>■ Starting impossible if phase failure</li> </ul>	Overheating <sup>(1)</sup>
High starting frequency	<ul style="list-style-type: none"> <li>■ Failure of the automation system</li> <li>■ Too many manual control operations</li> <li>■ Numerous fault trips</li> </ul>	High stator and rotor temperature rise due to the frequent start current	Overheating <sup>(1)</sup> Consequences on the process
Voltage variations	<ul style="list-style-type: none"> <li>■ Instability of the mains voltage</li> <li>■ Connection of heavy loads</li> </ul>	<ul style="list-style-type: none"> <li>■ Reduction of usable torque</li> <li>■ Increase in losses</li> </ul>	Overheating <sup>(1)</sup>
Harmonics	<ul style="list-style-type: none"> <li>■ Pollution of the mains supply by variable speed drives, inverters, etc...</li> </ul>	<ul style="list-style-type: none"> <li>■ Reduction of usable torque</li> <li>■ Increase in losses</li> </ul>	Overheating <sup>(1)</sup>
Long starting time	<ul style="list-style-type: none"> <li>■ Resistive torque too high (load too heavy)</li> <li>■ Voltage drop</li> </ul>	Increase in starting time	Overheating <sup>(1)</sup>
Jamming	<ul style="list-style-type: none"> <li>■ Mechanical problem (crusher)</li> <li>■ Seizures</li> </ul>	Overcurrent	Overheating <sup>(1)</sup> Consequences on the process
No-load running	<ul style="list-style-type: none"> <li>■ Pump running empty</li> <li>■ Mechanical break in drive to the load</li> </ul>	Drop in current drawn	Consequences on the process
Frequency fluctuations	<ul style="list-style-type: none"> <li>■ Overload of a supply powered by limited independent sources</li> <li>■ Faulty alternator speed regulator</li> </ul>	<ul style="list-style-type: none"> <li>■ Increase in losses</li> <li>■ Interferes with synchronous devices (clock, recorder, ...)</li> </ul>	–
Overload	<ul style="list-style-type: none"> <li>■ Increase in resistive torque</li> <li>■ Voltage drop</li> <li>■ Drop in power factor</li> </ul>	Increase in current consumption	Overheating <sup>(1)</sup>
Loss of machine excitation	<ul style="list-style-type: none"> <li>■ Significant drop in excitation current</li> <li>■ Break in rotor winding</li> </ul>	<ul style="list-style-type: none"> <li>■ Increase in active power</li> <li>■ Drop in power factor</li> </ul>	Significant overheating of rotor and cage
Phase-Earth fault	<ul style="list-style-type: none"> <li>■ Accidental Phase-Earth contacts</li> <li>■ Accidental Phase-machine casing contacts (casing connected to earth)</li> </ul>	<ul style="list-style-type: none"> <li>■ Overvoltage developed in the mains supply</li> <li>■ Rise in earth potential (safety of persons)</li> </ul>	Consequences on safety of persons

<sup>(1)</sup> Then, in the longer or shorter term, depending on the seriousness of the fault and/or its frequency, short-circuit and destruction of the windings.



## Protection functions

### Short-circuit protection

#### General

A short-circuit results in a very rapid rise in current which can reach several hundred times the value of the operational current. The consequences of a short-circuit are dangerous to both equipment and persons. It is therefore imperative to use protection devices to detect the fault and very quickly break the circuit.

Two types of protection are commonly used:

- fuses (cutout) which break the circuit by melting, which then requires their replacement,
  - magnetic trip circuit breakers, often more simply called "magnetic circuit breakers", which only require re-setting to put them back into service.
- Short-circuit protection can also be built-into multifunction devices such as motor circuit breakers and contactor-breakers.

The main characteristics of short-circuit protection devices are:

- their breaking capacity: this is the highest prospective short-circuit current value that a protection device can break at a given voltage.
- their making capacity: this is the highest current value that the protection device can make at its rated voltage in specified conditions.

The making capacity is equal to  $k$  times the breaking capacity.



LS1D32  
fuse carrier



GS2N3  
switch disconnectors

#### Fuses (cutouts)

Fuses provide individual phase protection (single-pole), with a high breaking capacity in a compact size:

- mounted either in fuse carriers,
- or in isolators, replacing the original links or shunt bars.

For motor protection, aM type fuses are used. Their design characteristics allow them to conduct the high magnetising currents that occur when motors are switched on. They are therefore unsuitable for overload protection (unlike gG type fuses). This is why an overload relay must be included in the motor power supply circuit.



GV2L  
magnetic circuit breaker



GV4LE  
magnetic circuit breaker

#### Magnetic circuit breakers

These circuit breakers protect installations against short-circuits, within the limit of their breaking capacity.

Magnetic circuit breakers provide omnipole breaking as standard.

For relatively low short-circuit currents, the operation of a circuit breaker is faster than that of fuses.

This protection conforms to standard IEC 60947-2.

The thermal and electrodynamic effects are also limited, therefore ensuring better protection of cables and equipment.



# TeSys

## TeSys Overload relays

### Motor and machine protection



LRD10  
thermal overload relay



LRD365  
thermal overload relay



RM4JA current measurement relay

#### Protection functions

##### Overload protection

###### General

An overload condition is the most frequently encountered fault. The symptoms are a rise in the current drawn by the motor and thermal effects. A rapid return to normal operating conditions is important. The actual operating conditions (ambient temperature, operating altitude and type of standard duty) are essential to determine the operating values of the motor (power, current) and to be able to select effective overload protection. These operational values are given by the motor manufacturer.

According to the level required, protection can be provided by:

- overload relays and thermal overload relays (bi-metallic or electronic type) which protect motors in the event of:
  - overload, by monitoring the current drawn by each phase,
  - phase imbalance or failure, by their differential mechanism.
- relays with PTC thermistor probes (Positive Temperature Coefficient).
- overtorque relays,
- multifunction relays.

##### Overload relays

These relays protect motors against overload. They must allow the temporary overload that occurs on starting and must only trip if the starting time is abnormally long.

The overload relay will be selected according to the length of the starting time (tripping class) and the motor rating.

These relays have a thermal memory (except for certain electronic overload relays, indicated by their manufacturers) and can be connected:

- either in series with the load,
- or to current transformers placed in series with the load.

##### Bi-metallic thermal overload relays

Combined with a contactor, these relays protect the line and the equipment against small and prolonged overloads. They must be protected against strong overcurrent by a circuit breaker or fuses.

These relays may be used on an a.c. or d.c. system and are generally:

- 3-pole,
- compensated, i.e. insensitive to ambient temperature variations,
- with manual or automatic reset,
- graduated with a "motor FLC" scale: allowing direct setting to the full load current as shown on the motor rating plate.

They can also be sensitive to phase failure: this is known as 'differential'. This function conforms to standards IEC 60947-4-1 and 60947-6-2.

This type of relay is extremely reliable and is a relatively low cost device.

##### Electronic thermal overload relays

Electronic thermal overload relays have the advantage of electronics which allow a more complex thermal image of the motor to be created.

They can be combined with products having complementary functions, such as:

- temperature sensing via PTC probes,
- protection against jamming and overtorque,
- protection against phase reversal,
- earth fault protection,
- protection against no-load running,
- alarm function.



# TeSys

## TeSys Overload relays

### Motor and machine protection



LT3S relays for use with thermistor probes



LR97D07 instantaneous electronic overcurrent relays



TeSys U LUB320 starter with multifunction control unit LUCM



TeSys U controller LUTM20BL



TeSys T controller LTM08MBD

#### Protection functions *(continued)*

##### Overload protection *(continued)*

###### Relays for use with PTC thermistor probes

With direct sensing of the stator windings, these relays can be used to protect motors against:

- overload,
- a rise in ambient temperature,
- a ventilation circuit fault,
- a high starting frequency,
- mechanical shocks, etc.

##### Overload (or overtorque) relays

These relays protect the drive line in the event of a locked rotor, seizure or mechanical shocks. This is an additional protection.

Unlike thermal overload relays, these relays do not have a thermal memory. They have definite time characteristics (adjustable current threshold and time delay).

The overtorque relay can be used as overload protection for motors with long starting times or very frequent starting (for example, lifting hoists).

##### Multifunction relays

■ Overcurrent relays are limited when it is necessary to take into account problems associated with voltage, temperature or special applications. New production or maintenance management needs have prompted manufacturers to offer products which provide not only adaptable protection, but also complete management of the motor and its load.

They incorporate:

- current and voltage sensors (TeSys T controllers),
- hybrid analog and digital electronic technology,
- the use of communication buses for data exchange and control,
- powerful motor modelling algorithms,
- integrated application programs whose parameters can be set.

These products make it possible to reduce installation and operating costs by reducing maintenance and downtime.

TeSys U starters:

The multifunction relay is incorporated in the motor starter.

This solution is very compact with reduced wiring. It is limited to 32 A.

TeSys U controllers:

The multifunction relay is separate from the power line and reuses the function blocks from the TeSys U solution. It can be used in conjunction with a contactor up to 810 A.

TeSys T controllers:

The multifunction relay is separate from the power line and incorporates inputs and outputs. It can be used in conjunction with a contactor up to 810 A.



# TeSys

## TeSys Overload relays

### Motor and machine protection

Protection relay selection table					
Relay type	Motor protection		Machine protection	Motor and machine protection	
	Thermal overload relay	Relays for use with PTC probes	Overtorque relays	TeSys U controller	TeSys T controller
	LR2K, LRD, LRD3, LR9 F, LR9 D <sup>(1)</sup>	LT3S	LR97D, LT47	LUTM	LTMR
Causes of overheating	(2)		(2)	(2)	(3)
Slight overload					
Locked rotor					
No-load running					
Supply phase failure			LR97D		
Ventilation fault					With probes
Abnormal temperature rise					With probes
Shaft bearing seizure					With probes
Insulation fault					
Protracted starting time					
Severe duty					With probes
Voltage variation					
Frequency fluctuations					
Loss of machine excitation					

	Ideally suited
	Possible solution
	Not suitable (no protection)

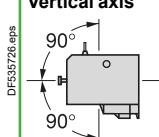
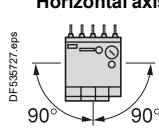
- (1) For motor circuit breaker type **GV2ME**.  
 (2) Protection based on current.  
 (3) Protection based on current and voltage.



# TeSys

## TeSys LRK Thermal overload relay

### Characteristics

Environment					
Conforming to standards			IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T14048.		
Product certifications			UL, CSA, CCC, EAC, CB certification		
Degree of protection	Conforming to IEC 60529		Protection against direct finger contact		
Ambient air temperature around the device	Storage	°C	-40...+70		
	For normal operation (IEC 60947)	°C	-20...+55 (without derating)		
	Operating limit	°C	-30...+60 (with derating) <sup>(1)</sup>		
Maximum operating altitude	Without derating	m	2000		
Operating positions			<div> <div> <b>Vertical axis</b>  </div> <b>Without derating</b> </div> <div> <div> <b>Horizontal axis</b>  </div> <b>With derating <sup>(1)</sup></b> </div>		
Flame resistance	Conforming to 60695-2-11	°C	850		
Shock resistance, hot state (1/2 sine wave, 11 ms)	Conforming to IEC 60068-2-27, N/C contact		10 gn		
	Conforming to IEC 60068-2-27, N/O contact		10 gn		
Vibration resistance, hot state 5 to 300 Hz	Conforming to IEC 60068-2-6, N/C contact		2 gn		
	Conforming to IEC 60068-2-6, N/O contact		2 gn		
Cabling Screw clamp terminals	Solid cable Flexible cable without cable end Flexible cable with cable end	mm <sup>2</sup>	Minimum	Maximum	Maximum to IEC 60947
		mm <sup>2</sup>	1 x 1.5	2 x 4	1 x 4 + 1 x 2.5
		mm <sup>2</sup>	1 x 0.75	2 x 4	2 x 2.5
		mm <sup>2</sup>	1 x 0.34	1 x 1.5 + 1 x 2.5	1 x 1.5 + 1 x 2.5
Tightening torque	Phillips head n° 2 - Ø6	N.m	0.8		
Mounting			Directly under the contactor or reversing contactor		
Connections			<p>Made automatically when mounted under the contactor, as follows:</p> <ul style="list-style-type: none"> <li>■ contactor terminal A2 connected to overload relay terminal 96 on all products,</li> <li>■ contactor terminal 14 connected to overload relay terminal 95 on products with 3 P + N/O.</li> </ul> <p>When using 3 P + N/C, or 4 P contactors, or the N/O auxiliary contact marked 13-14, at a voltage other than the coil voltage, break off the link marked 14.</p>		

Auxiliary contact characteristics									
Number of contacts			1 N/C + 1 N/O						
Conventional thermal current		A	6						
Short-circuit protection	Conforming to IEC 60947 gG fuse or circuit breaker GB2CB●●	A	6 max.						
Maximum power of the controlled contactor coils (sealed) (Occasional operating cycles of contact 95-96)	a.c.	V	24	48	110	220/230	400	415/440	600/690
		VA	100	200	400	600	600	600	600
	d.c.	V	24	48	110	220	250	—	—
		W	100	100	50	45	35	—	—
		V	690						
		V	250						
Maximum operational voltage	a.c., category AC-15	V	690						
	d.c., category DC-13	V	250						

(1) Please consult your Regional Sales Office.  
(2) Very low safety voltage.



# TeSys

## TeSys LRK Thermal overload relays

### Characteristics

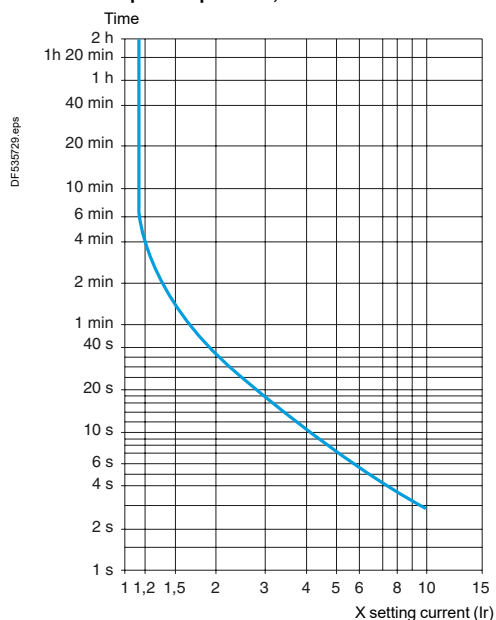
Electrical characteristics of the power circuit			
Rated operational voltage (Ue)	Up to	<b>V</b>	690
Rated insulation voltage (Ui)	Conforming to IEC 60947	<b>V</b>	690
	Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1	<b>V</b>	600
Rated impulse withstand voltage (Uimp)		<b>kV</b>	6
Frequency limits of the operational current		<b>Hz</b>	Up to 400
Power dissipated per pole		<b>W</b>	2

Operating characteristics			
Tripping threshold	Conforming to IEC 60947-4-1	<b>A</b>	1.14 ±0.06 I <sub>r</sub>
Sensitivity to phase failure	Conforming to IEC 60947		Yes
Reset	Manual or automatic		Selected by means of a lockable and sealable switch on the front of the relay
Signalling	On front of relay		Trip indicator
Reset-Stop function			Pressing the Reset-Stop button: - actuates the N/C contact - has no effect on the N/O contact
Test function	By pushbutton		Pressing the Test button enables: - checking of the control circuit wiring - simulation of overload tripping (actuation of both N/C and N/O contacts, and of the trip indicator)
Short-circuit protection and coordination			See pages A6/11 and A6/20

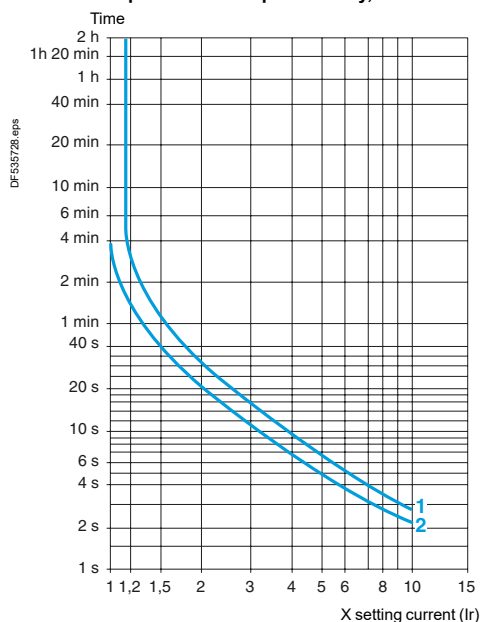
### Tripping curves

#### Average operating time related to multiples of the current setting (Class 10 A)

Balanced 3-phase operation, from cold state



Balanced operation with 2 phases only, from cold state



Setting: at lower end of scale

Setting: at upper end of scale



# TeSys

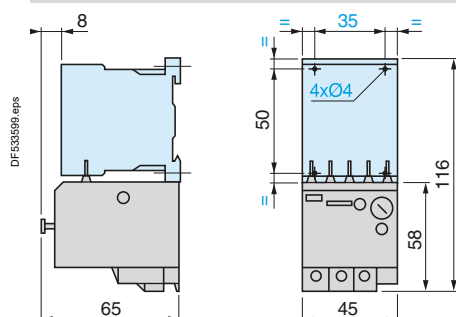
## TeSys LRK Thermal overload relays

### Dimensions, mounting, schemes

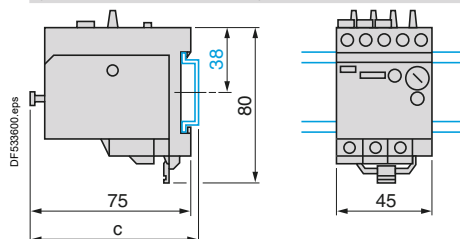
#### Dimensions, mounting

##### LR2K

Direct mounting beneath the contactor



Separate mounting with terminal block LA7 K0064 on 35 mm rail (AM1DP200 or AM1DE200)



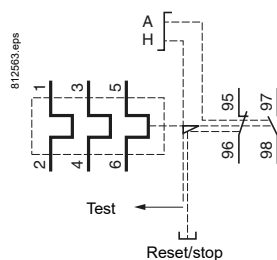
AM1	c
DP200	78.5
DE200	86

#### Schemes

##### LR2K

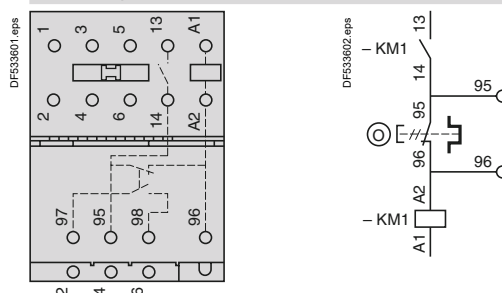


Ref.

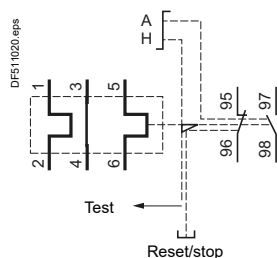


##### LR2K + LC•K

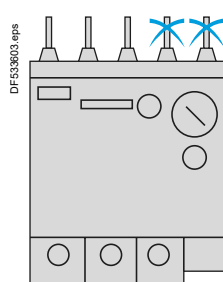
Pre-wiring scheme



##### LR7K



**Note:** If pre-wiring is not required, break off the 2 links located on the thermal overload relay.



Overload relays



# TeSys

## TeSys LRD Thermal overload relays

### Characteristics



LRD10



LRD04L...32L

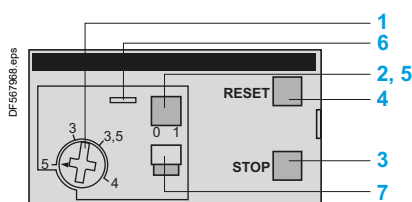


LRD365

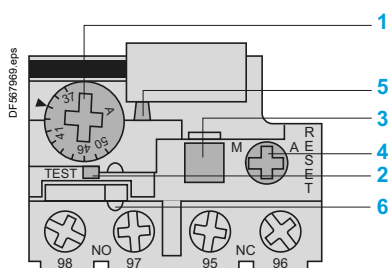
**EverLink®**



LRD33●●



LRD01...35, LRD04L...32L  
LRD313...LRD365



LRD3361...4369, LR2 D3561...3563

### Introduction

3-pole TeSys D thermal overload relays are designed to protect a.c. circuits and motors against:

- overloads
- phase failure
- excessively long starting times
- prolonged stalled rotor condition.

### Power connection

#### LRD01 to LRD35

LRD01 to 35 relays are designed for connection by screw clamp terminals. They can be supplied for connection by spring terminals or by lugs <sup>(1)</sup>.

#### LRD04 to LRD32L

These relays are designed for connection by screw clamp terminals. They can be supplied for connection by lugs <sup>(1)</sup>.

#### LRD313 to LRD380

These relays are for connection by BTR screw connectors (hexagon socket head). The screws are tightened by means of a size 4, insulated Allen key.

This type of connection uses the **EverLink®** system with creep compensation <sup>(2)</sup> (Schneider Electric patent).

This technique makes it possible to achieve accurate and durable tightening torque.

These relays are also available for connection by lugs <sup>(1)</sup>.

#### LRD3361 to 4369, LR2D3561 to D3563

LRD3361 to 4369 and LR2D3561 to D3563 relays are designed for connection by screw clamp terminals. They can be supplied for connection by lugs <sup>(1)</sup>.

### Description

TeSys D 3-pole thermal overload relays are designed to protect a.c. circuits and motors against overloads, phase failure, long starting times and prolonged stalling of the motor.

- 1 Adjustment dial Ir.
- 2 Test button.  
Operation of the Test button allows:
  - checking of control circuit wiring,
  - simulation of relay tripping (actuates both the N/O and N/C contacts).
- 3 Stop button. Actuates the N/C contact; does not affect the N/O contact.
- 4 Reset button.
- 5 Trip indicator.
- 6 Setting locked by sealing the cover.
- 7 Selector for manual or automatic reset.

LRD01 to 35, LRD04L to 32L and LRD313 to LRD380 relays are supplied with the selector in the manual position, protected by a cover. Deliberate action is required to move it to the automatic position.

<sup>(1)</sup> Connection by lugs meets the requirements of certain Asian markets and is suitable for applications subject to strong vibration, such as railway transport.

<sup>(2)</sup> Creep: normal crushing phenomenon of copper conductors, that is accentuated over time.



# TeSys

## TeSys LRD Thermal overload relays

### Characteristics

#### Environment

Conforming to standards			IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1 UL 60947-5-1, CSA C22.2 n° 60947-5-1, EN 50495 <sup>(1)</sup> , GB/T 14048.4, GB/T 14048.5
Product certifications			UL <sup>(2)</sup> , CSA <sup>(2)</sup> IEC, CCC <sup>(3)</sup> , EAC, ATEX <sup>(1)</sup> ABS, BV <sup>(4)</sup> , DNV-GL <sup>(5)</sup> , LRoS <sup>(6)</sup> , RINA <sup>(7)</sup> , RMRS <sup>(8)</sup> , EU RO Mutual recognition <sup>(9)</sup>
Degree of protection (front face)	Conforming to IEC 60529		Protection against direct finger contact IP20
Climatic withstand			Conforming to IACS E10
Ambient air temperature around the device	Storage	°C	-60...+70
	Normal operation, without derating (IEC 60947-4-1)	°C	-20...+60
	Minimum /maximum operating temperatures (with derating)	°C	-20...+70
Operating positions without derating	In relation to normal vertical mounting plane		Any position. When mounting on a vertical rail, use a stop.
Flame resistance	Conforming to 60695-2-11	°C	850
Shock resistance	Permissible acceleration conforming to IEC 60068-2-7		15 gn - 11 ms
Vibration resistance <sup>(10)</sup>	Permissible acceleration conforming to IEC 60068-2-6		6 gn except LRD04L...LRD32L: 3 gn
Dielectric strength at 50 Hz	Conforming to IEC 60947-1	kV	1.89 (product Ui 690 V), 2.2 (product Ui 1000 V)
Impulse withstand voltage	Conforming to IEC 60947-1	kV	6

#### Electrical characteristics of power circuit

Relay type		LRD01 ...16, LR3D01 ...16	LRD04L ...32L	LRD21 ...35, LR3D21 ...35	LRD313 ...365 LR3D 313 ...38	LRD313L ...365L	LRD3322 ...33696 LR3D3322 ... 33696	LR2D 3522 ... 3563	LRD 4365 ... 4369
Tripping class	Conforming to UL 60947-4-1, IEC 60947-4-1	10 A	20	10 A	10 A	20	10 A	20	10 A
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1	V	690				1000 <sup>(11)</sup>		
	Conforming to UL, CSA	V	600						600 except LRD 4369
Rated impulse withstand voltage (Uimp)		kV	6						
Rated operational voltage (Ue)		V	690						
Frequency limits	Of the operating current	Hz	0...400						
Setting range	Depending on model	A	0.1...13	0.63...32	12...38	9...80	9...65	17...140	17...80 80...140

#### Auxiliary contact characteristics

Conventional thermal current		A	5						
Max. sealed consumption of the operating coils of controlled contactors (Occasional operating cycles of contact 95-96)	a.c. supply, AC-15	V	120	240	380	480	500	600	
		A	3	1.5	0.95	0.75	0.72	0.12	
	d.c. supply, DC-13	V	125	250	440				
		A	0.22	0.1	0.06				
Protection against short-circuits	By gG, BS fuses. Maximum rating or by GB2	A	4						

<sup>(1)</sup> For relays LRD01 to LRD380, LRD3322 to LRD3365, LRD04L to LRD32L, LRD4365 to LRD4369, LRD33656 to LRD33696.

<sup>(2)</sup> Except for relays LRD4369.

<sup>(3)</sup> CCC: Except for LRD/LR3D04L to LRD/LR3D32L, LR2D3522 to LR2D3563.

<sup>(4)</sup> BV: except for LRD/LR3D04L to LRD/LR3D32L, LRD/LR3D313 to LRD/LR3D380.

<sup>(5)</sup> DNV-GL: except for LRD04L to LRD32L.

<sup>(6)</sup> LRoS: except for LRD/LR3D04L to LRD/LR3D32L, LRD/LR3D380.

<sup>(7)</sup> RINA: for LRD/LR3D01 to LRD/LR3D35.

<sup>(8)</sup> RMRS: for LRD/LR3D313 to LRD/LR3D380.

<sup>(9)</sup> EU RO Mutual Recognition: for LRD/LR3D313 to LRD/LR3D380, LRD313L to LRD365L.

<sup>(10)</sup> In case of vibration above 3gn on TeSys D Green contactor directly mounted with LRD, it is recommended to mount the devices separately by screws on metal plate.

<sup>(11)</sup> 750 V for LRD33656, LRD33676, LRD33696.





# TeSys

## TeSys LRD Thermal overload relays

### Characteristics

Power circuit connection characteristics												
Relay type				LRD01 ...16, LR3D01 ...16	LRD04L ...21L	LRD22L ...32L	LRD21 ...35, LR3D21 ...35	LRD 313 ...365 LR3D 313 ...380	LRD 313L ...365L	LRD 3322 ...33696 LR3D 3322 ... 33696	LR2D 3522 ...3563	LRD 4365 ...4369
Connection to screw clamp terminals												
Flexible cable without cable end	1 conductor	mm <sup>2</sup>	1.5...10				1.5...10	1...35	1...35	4...35		4...50
Flexible cable with cable end	1 conductor	mm <sup>2</sup>	1...4		1...6	1...6 except LRD21: 1...4	1...35	1...35	4...35			4...35
Solid cable without cable end	1 conductor	mm <sup>2</sup>	1...6		1.5...10	1.5/10 except LRD21: 1/6	1...35	1...35	4...35			4...50
Tightening torque			N.m	1.7		2.5	2.5	1...25: 5 35: 8	1...25: 5 35: 8	9	9	9
Connection to spring terminals (Min/max c.s.a.) (except LRD04L...LRD32L)												
Flexible cable without cable end	1 conductor	mm <sup>2</sup>	1.5...4	–	–	1.5...4	–	–	–	–	–	–
Flexible cable with cable end	1 conductor	mm <sup>2</sup>	1.5...4	–	–	1.5...4	–	–	–	–	–	–
Connection by bars or lugs												
Relay type				LRD016...166 LRD04L6 ... 16L6	LRD216...356 LRD21L6 ... 32L6	LRD3136 ... 3806	LRD313L6 ... 365L6	LRD3322A66 ... 3365A66				
Pitch	Without spreaders	mm	14.5	17.5		17.5	17.5	21.5				
Bars or cables with lugs	e	mm	≤ 6	≤ 6		≤ 6	≤ 6	≤ 6				
	L	mm	≤ 8	≤ 8		≤ 13.5	≤ 13.5	≤ 16				
	L'	mm	≤ 9.5	≤ 9.5		≤ 16.5	≤ 16.5	≤ 16				
	d		≤ 7	≤ 7		≤ 10	≤ 10	≤ 12				
Screws				M4	M4	M6	M6	M10				
Tightening torque			N.m	1.7	2.5	6	6	11.3				

Control circuit connection characteristics											
Connection to screw clamp terminals or spring terminals											
Bare cables											
Relay type			LRD01 ...16, LR3D01 ...16	LRD04L ...21L	LRD22L ...32L	LRD21 ...35, LR3D21 ...35	LRD 313 ...365 LR3D 313 ...380	LRD 313L ...365L	LRD3322 ...33696 LR3D 3322 ... 33696	LR2D 3522 ... 3563	LRD 4365 ...4369
Connection to screw clamp terminals <sup>(1)</sup>	Solid cable without cable end	mm <sup>2</sup>	2 x 1...2.5								
	Flexible cable without cable end	mm <sup>2</sup>	2 x 1...2.5								
	Flexible cable with cable end	mm <sup>2</sup>	2 x 1...2.5								
Tightening torque		N.m	1.7								
Connection to spring terminals (Min/max c.s.a.) (except LRD04L...LRD32L)	Solid cable	mm <sup>2</sup>	1...2.5	—		1...2.5		—			
	Flexible cable without cable end	mm <sup>2</sup>	1...2.5	—		1...2.5		—			

(1) For relays **LRD313 to 380**: BTR hexagon socket head screws, **EverLink®** system.  
In accordance with local electrical wiring regulations, a size 4 insulated Allen key must be used (reference **LADALLEN4**, see page B8/28).



# TeSys

## TeSys LRD Thermal overload relays

### Characteristics

#### Operating characteristics

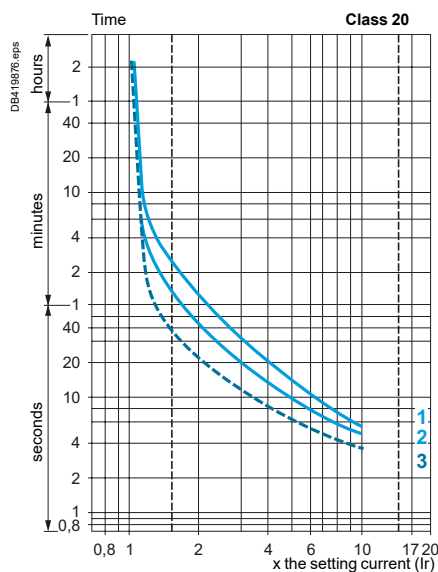
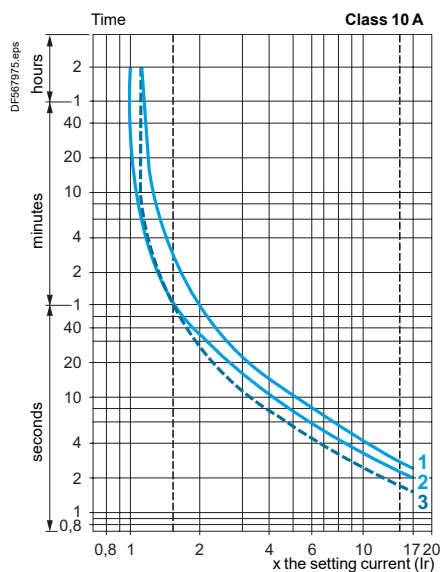
Relay type		LRD01 ...16, LR3D01 ...16	LRD04L... LRD32L	LRD21 ...35, LR3D21 ...35	LRD313 ...365 LR3D 313 ...380	LRD313L ...365L	LRD3322 ...33696 LR3D3322 ... 33696	LR2D 3522 ... 3563	LRD 4365 ...4369
Temperature compensation		°C -20...+60							
Tripping threshold		Conforming to IEC 60947-4-1		A 1.14 ±0.06 Ir					
Sensitivity to phase failure		Tripping current 130 % of Ir on two phases, the third phase at 0.							

#### Tripping curves

Average operating time related to multiples of the setting current

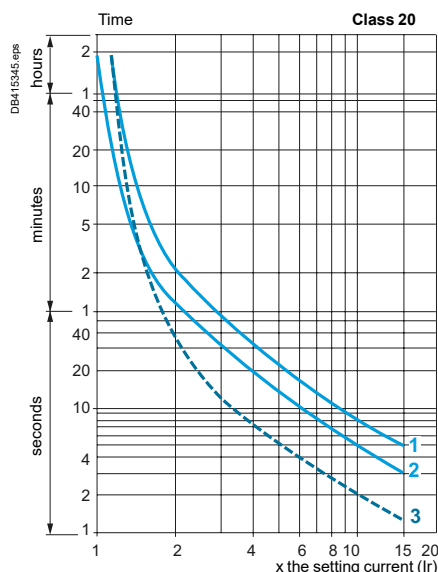
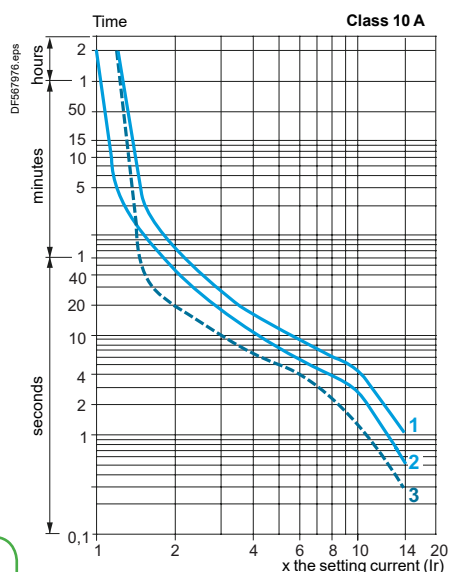
LRD01 to LRD35, LR2D and LRD3322 to LRD4369

LRD04L to LRD32L and LR2D3522 to LR2D3563



LRD313 to LRD380

LRD313L to LRD365L



- 1 Balanced operation, 3-phase, without prior current flow (cold state).
- 2 2-phase operation, without prior current flow (cold state).
- 3 Balanced operation, 3-phase, after a long period at the set current (hot state).



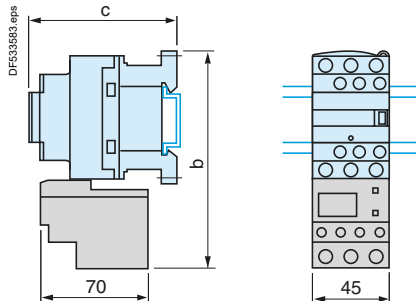
# TeSys

## TeSys LRD Thermal overload relays

### Dimensions, mounting

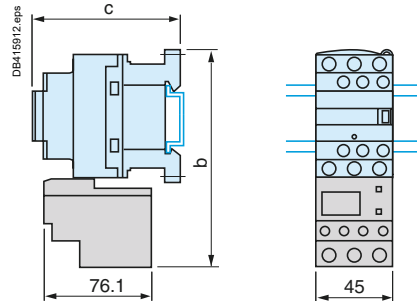
#### LRD01...35 <sup>(1)</sup>

Direct mounting beneath contactors with screw clamp connections



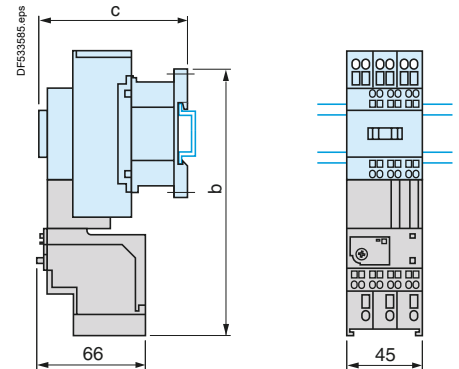
#### LRD04...32L <sup>(1)</sup>

Direct mounting beneath contactors with screw clamp connections



#### LRD013...223

Direct mounting beneath contactors with spring terminal connections



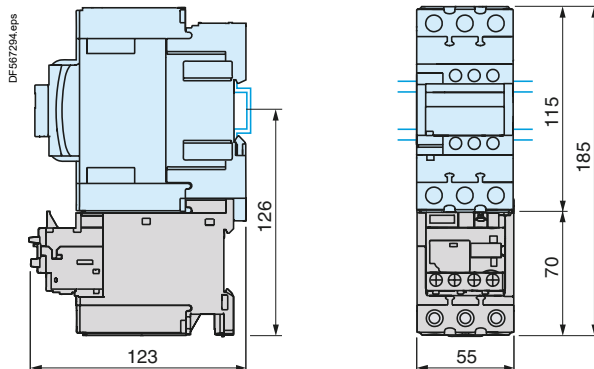
LC1	D09...D18	D25...D38
b	123	137
c	See pages B11/32 and B8/73	

LC1	D09...D18	D25...D38
b	123	137
c	See pages B11/32 and B8/73	

LC1	D093...D253
b	168
c	See pages B11/32 and B8/73

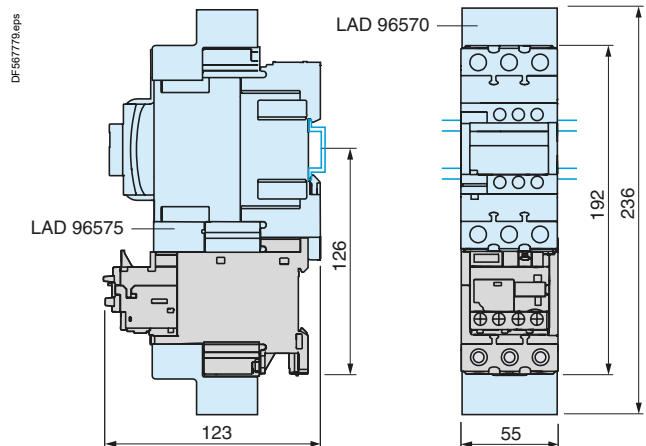
#### LRD313 ...380 <sup>(1)</sup>

Direct mounting beneath contactors LC1D40A...D80A with screw clamp connections or EverLink® connectors



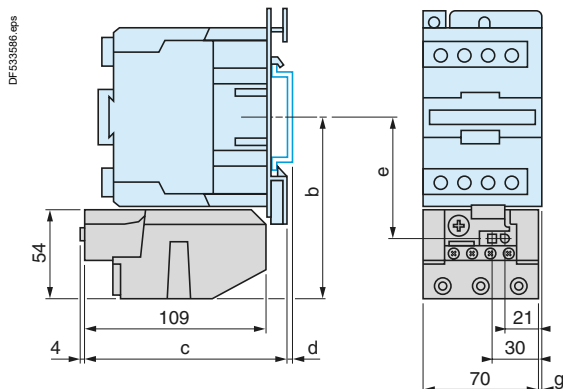
#### LRD3136 ...3806 <sup>(1)</sup>

Direct mounting beneath contactors LC1D40A6...D80A6 with lugs



#### LRD33...D95

Direct mounting beneath contactors LC1D80...D95



AM1	DL201	DL200
d	7	17

#### Control circuit AC

	b	c	e	g (tri)	g (tetra)
LC1D80	115.5	124	76.9	9.5	22
LC1D95	115.5	124	76.9	9.5	-

#### Control circuit DC

LC1D80, D95	115.5	179.4	76.9	9.5	22
-------------	-------	-------	------	-----	----

<sup>(1)</sup> In case of vibration above 3 gn on TeSys D Green contactor directly mounted with LRD, it is recommended do mount the devices separately by screws on metal plate.







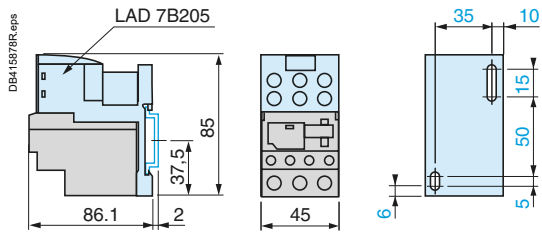
# TeSys

## TeSys LRD Thermal overload relays

### Dimensions, mounting and schemes

#### LRD04L...32L

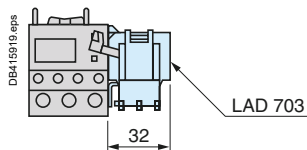
Independent mounting on 50 mm centres or on rail AM1DP200 or DE200



AM1 DP200 DE200

d 2 9.5

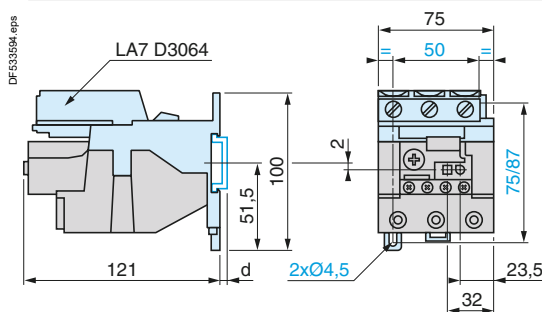
Remote tripping or electrical reset



(1) Can be mounted on RH or LH side of relay LR2D15.

#### LRD3... and LR2D35...

Independent mounting on 50 mm centres or on rail AM1DP200 or DE200



AM1 DP200 DE200

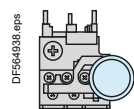
d 2 9.5

#### LRD3...

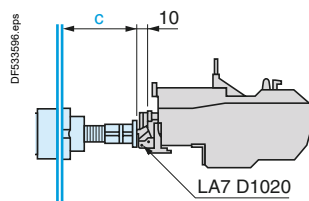
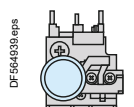
Adapter for door mounted operator

LA7D1020

Stop

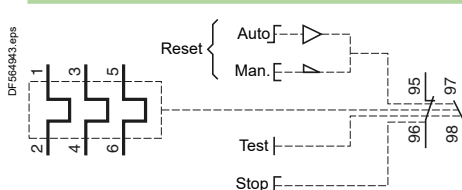


Reset

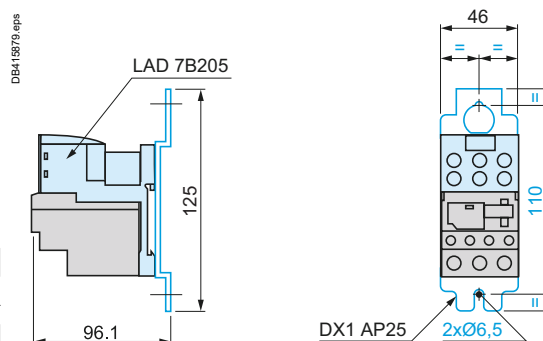


c: adjustable from 17 to 120 mm

#### LRD..., LRD3... and LR2D...

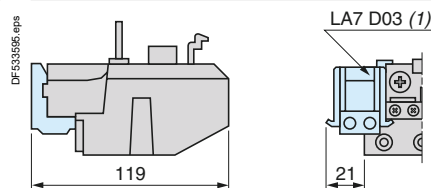


Independent mounting on 110 mm centres



#### LRD3..., LR2D35... and LR9D

Remote tripping or electrical reset



(1) Can be mounted on RH or LH side of relay LRD3..., LR2D35... or LR9D.

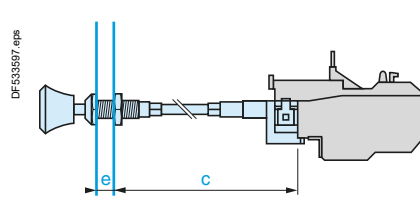
#### LRD, LRD313...380, LRD04...32L

"Reset" by flexible cable

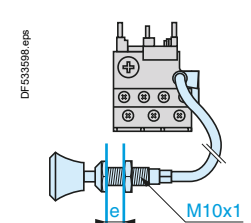
LA7D305 and LAD7305

Mounting with cable straight

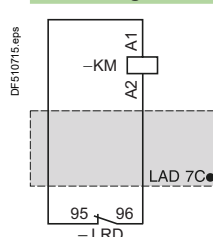
Mounting with cable bent



e: up to 20 mm / c: up to 550 mm



#### Pre-wiring kit LAD7C1, LAD7C2



Characteristics:  
pages B11/31 to B11/34

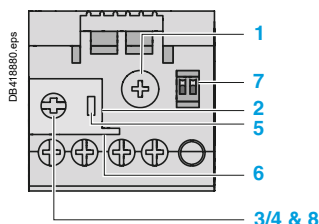
References:  
pages B11/4 to B11/7



# TeSys

## TeSys LR9D Electronic overload relays

### Characteristics



LR9D01...110S

#### Description: LR9D01, 02, 08 and 32

These self-powered electronic thermal overload relays are designed for direct mounting to contactors LC1D09 through LC1D38.

LR9D110S self-powered electronic thermal overload relay is designed for separate mounting only.

In addition to the protection provided by the TeSys D thermal overload relays (see page B11/31), they offer the following additional features:

- protection against phase imbalance
- choice of starting class
- protection of unbalanced circuits
- protection of single-phase circuits

- 1 Adjustment dial Ir.
- 2 Test button.
- 3 Stop button.
- 4 Reset button.
- 5 Trip indicator.
- 6 Setting locked by sealing the cover.
- 7 Class 5/10/20/30 dipswitches.
- 8 Reset mode selector.

#### Environment

Relay type		LR9D01, 02, 08, 32 and LR9D110S	
Conforming to standards		IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4	
Product certifications		CCC, CSA, UL, CB certification	
Degree of protection	Conforming to IEC 60529 and VDE 0106	IP 20 on front panel	
Ambient air temperature around the device (Conforming to IEC 60255-8)	Storage	°C	-55 to +80
	Normal operation	°C	-25 to +70
Maximum operating altitude	Without derating	m	2000
Operating positions without derating	In relation to normal vertical mounting plane	Any position	
Shock resistance	Permissible acceleration conforming to IEC 60068-2-27	15 g (11ms)	
Vibration resistance	Permissible acceleration conforming to IEC 60068-2-6	6 g (10-150 Hz)	
Dielectric strength at 50 Hz	Conforming to IEC 60947-4-1	kV	6
Surge withstand, common mode	Conforming to IEC 61000-4-5	kV	2
Resistance to electrostatic discharge	Conforming to IEC 61000-4-2	kV	8
Immunity to radiated radio-frequency disturbances	Conforming to IEC 61000-4-3 and NF C 46-022	V/m	10
Immunity to fast transient currents	Conforming to IEC 61000-4-4	kV	2
Electromagnetic compatibility	Draft EN 50081-1 and 2, EN 50082-2	Meets requirements	

#### Electrical characteristics of auxiliary contacts

Conventional thermal current		A	5					
Max. sealed consumption of the operating coils of controlled contactors (Occasional operating cycles of contact 95-96)	a.c. supply, AC-15	V	24	48	110	220	380	600
		VA	100	200	400	600	600	600
	d.c. supply, DC-13	V	24	48	110	220	—	—
		W	100	100	50	45	—	—
Protection against short-circuits	By gG or BS fuses or by circuit breaker GB2	A	5					
Cabling	1 or 2 conductors	mm <sup>2</sup> (AWG)	1 to 2.5 (18 to 14)					
Flexible cable without cable end	Tightening torque	Nm (lb-in)	0.8 (7)					



# TeSys

## TeSys LR9D Electronic overload relays

### Characteristics

#### Electrical characteristics of power circuit

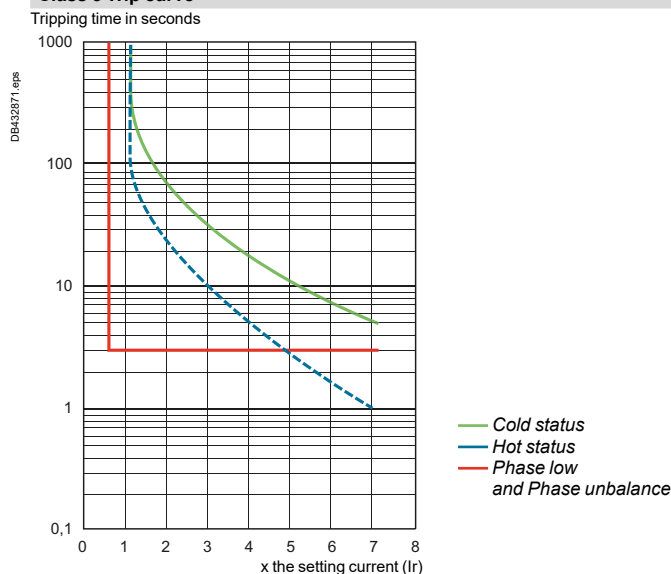
Relay type		LR9D01	LR9D02	LR9D08	LR9D32	LR9D110S
Tripping class	Conforming to IEC/EN 60947-4-1	5, 10, 20, 30				
	Conforming to UL 60947-4-1, CSA C22.2 n° 60947-4-1	10, 20, 30				
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1	V AC 1000				
Rated operational voltage (Ue)	Conforming to IEC 60947-4-1	V AC 690				
	Conforming to UL/CSA	V AC 600				
Rated impulse withstand voltage		kV 6				
Frequency limits	Of the operating current	Hz 50...60				
Setting range		A 0.1...0.5 0.4...2 1.6...8 6.4...32 22...110				
Power circuit connections	Wire size - 1 or 2 conductors	mm <sup>2</sup> (AWG) 1 to 16 (14 to 6) 4 to 50 (10 to 1/0)				
	Tightening torque	Nm (lb-in) 3.1 (28) 9 (80)				

#### Operating characteristics

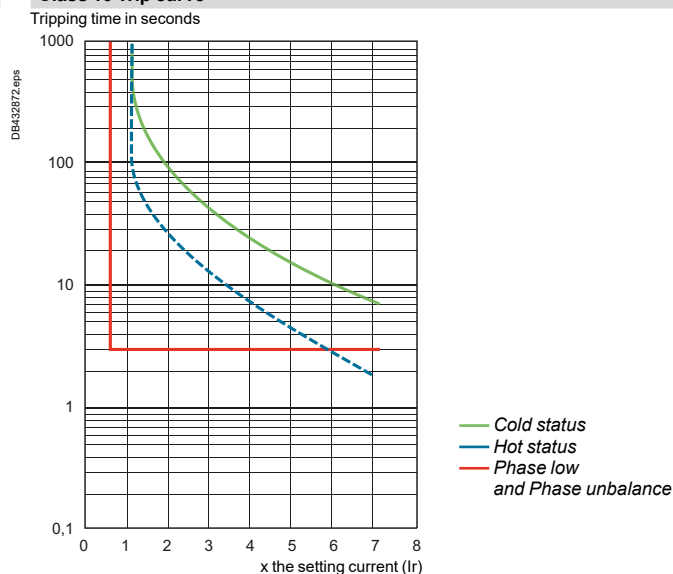
Consumption	mW	< 300
Tripping thresholds	Conforming to IEC 60947-4-1	A 1.25 I <sub>n</sub>
Sensitivity to phase unbalance	Conforming to IEC 60947-4-1	Phase difference > 40%, tripping in 3 s
Current setting ratio		5:1
Automatic reset time	min.	1.5...4

#### LR9D01, 02, 08, 32, LR9110S tripping curves

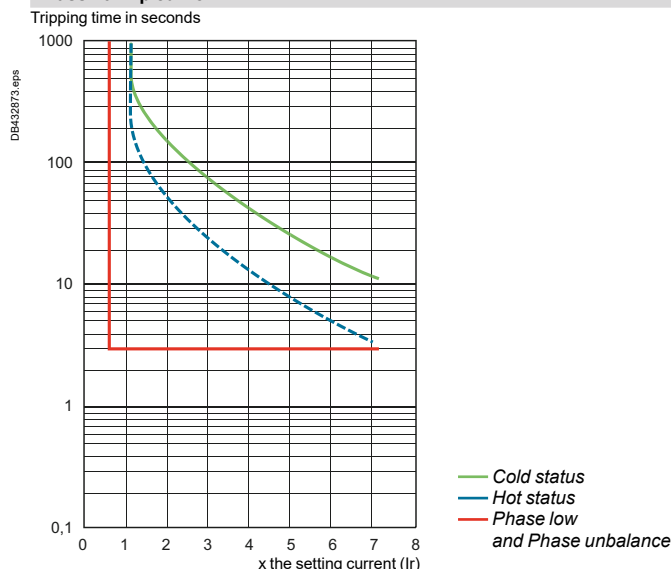
##### Class 5 Trip curve



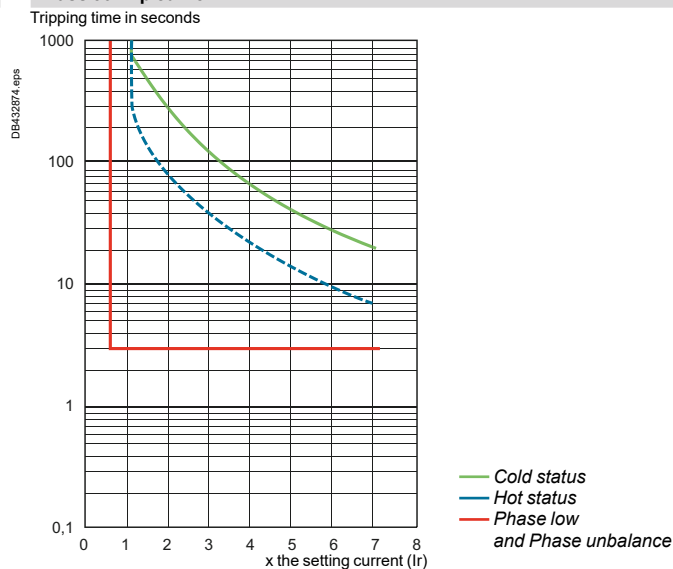
##### Class 10 Trip curve



##### Class 20 Trip curve



##### Class 30 Trip curve



References:  
page B11/10

Dimensions, mounting:  
page B11/42

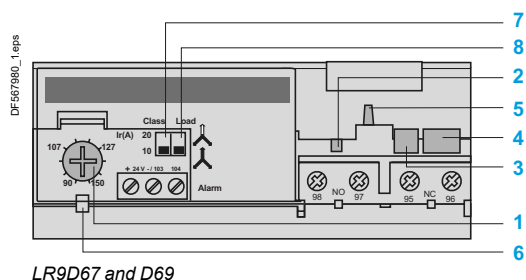
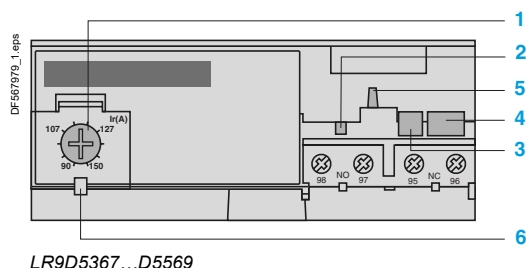
Schemes:  
page B11/43



# TeSys

## TeSys LR9D Electronic overload relays

### Characteristics





#### Description: LR9D5367...LR9D5569, LR9D67, LR9D69

These electronic thermal overload relays are designed for use with contactors LC1D115 and D150.

In addition to the protection provided by TeSys D thermal overload relays (see page B11/31), they offer the following special features:

- protection against phase imbalance
- choice of starting class
- protection of unbalanced circuits
- protection of single-phase circuits
- alarm function to avoid tripping by load shedding.

- 1 Adjustment dial Ir.
- 2 Test button.
- 3 Stop button.
- 4 Reset button.
- 5 Trip indicator.
- 6 Setting locked by sealing the cover.
- 7 Class 10/class 20 selector switch.
- 8 Selector for balanced load  /unbalanced load 

#### Environment

Relay type		LR9D5367...LR9D5569, LR9D67, LR9D69	
Conforming to standards		IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4	
Product certifications		UL, CSA, CCC, ABS, BV, DNV-GL	
Degree of protection	Conforming to IEC 60529	IP 20 on front panel with protective covers <b>LA9D11570●</b> or <b>D11560●</b>	
Climatic withstand		according to IACS E10	
Ambient air temperature around the device	Storage	°C	- 40...+ 85
(Conforming to IEC 60255-8)	Normal operation	°C	- 20...+ 55 <sup>(1)</sup>
Maximum operating altitude	Without derating	m	2000
Operating positions without derating	In relation to normal vertical mounting plane		Any position
Shock resistance	Permissible acceleration conforming to IEC60028-2-27		13 gn - 11 ms
Vibration resistance	Permissible acceleration conforming to IEC 60068-2-6		2 gn - 5...300 Hz
Dielectric strength at 50 Hz	Conforming to IEC 60947-4-1	kV	6
Surge withstand	Conforming to IEC 61000-4-5	kV	6
Resistance to electrostatic discharge	Conforming to IEC 61000-4-2	kV	8
Immunity to radiated radio-frequency disturbances	Conforming to IEC 61000-4-3	V/m	10
Immunity to fast transient currents	Conforming to IEC 61000-4-4	kV	2
Electromagnetic compatibility	EN 50081-1 and 2, EN 50082-2		Meets requirements

#### Electrical characteristics of auxiliary contacts

Conventional thermal current		A	5					
Max. sealed consumption of the operating coils of controlled contactors (Occasional operating cycles of contact 95-96)	a.c. supply	V	24	48	110	220	380	600
		VA	100	200	400	600	600	600
	d.c. supply	V	24	48	110	220	440	–
		W	100	100	50	45	25	–
Protection against short-circuits	By gG or BS fuses or by circuit breaker <b>GB2</b>	A	5					
Cabling	1 or 2 conductors	mm²	Minimum c.s.a.: 1					
Flexible cable without cable end			Maximum c.s.a.: 2.5					
	Tightening torque	Nm	1.2					

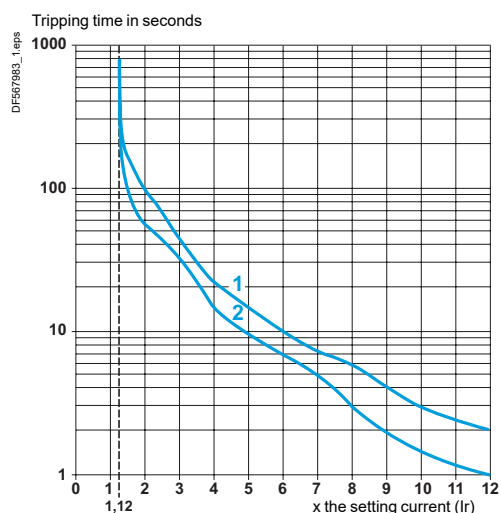
<sup>(1)</sup> For operating temperatures up to 70 °C, please consult your Regional Sales Office.



Electrical characteristics of power circuit			
Relay type		LR9D5367...LR9D5569, LR9D67, LR9D69	
Tripping class	Conforming to IEC/EN 60947-4-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1		10 or 20
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1	V	1000
	Conforming to UL, CSA	V	600
Rated impulse withstand voltage (Uimp)		kV	8
Frequency limits	Of the operating current	Hz	50...60 <sup>(1)</sup>
Setting range	Depending on model	A	60...150
Power circuit connections	Width of terminal lug	mm	20
	Clamping screw		M8
	Tightening torque	N.m	18
Operating characteristics			
Temperature compensation		°C	-20...+70
Tripping thresholds	Conforming to IEC 60947-4-1		
	Alarm	A	1.05 ±0.06 In
	Trip	A	1.12 ±0.06 In
Sensitivity to phase failure	Conforming to IEC 60947-4-1		Tripping in 4 s ±20 % in the event of phase failure
Alarm circuit characteristics			
Rated supply voltage	d.c. supply	V	24
Supply voltage limits		V	17...32
Current consumption	No-load	mA	≤ 5
Switching capacity		mA	0...150
Protection	Short-circuit and overload		Self protected
Voltage drop	Closed state	V	≤ 2.5
Cabling	Flexible cable without cable end	mm²	0.5...1.5
Tightening torque		N.m	0.45

<sup>(1)</sup> For other frequencies and for applications involving the use of these overload relays with soft starters or variable speed drives, please consult your Regional Sales Office.

#### LR9D5367...LR9D5569, LR9D67, LR9D69 tripping curves



Average operating time related to multiples of the setting current

- 1 Cold state curve
- 2 Hot state curve

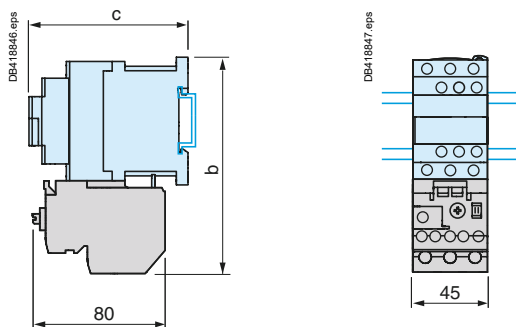


# TeSys

## TeSys LR9D Electronic overload relays

### Dimensions, mounting

#### LR9D01, 02, 08, 32

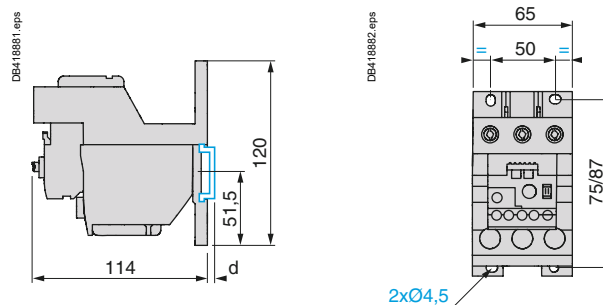


LC1 D09...D18 D25...D38

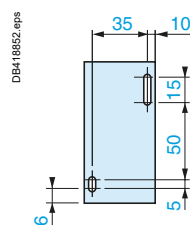
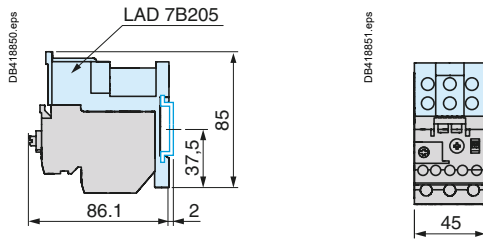
b 130 140

c See pages B8/65 and B8/66

#### LR9D110S

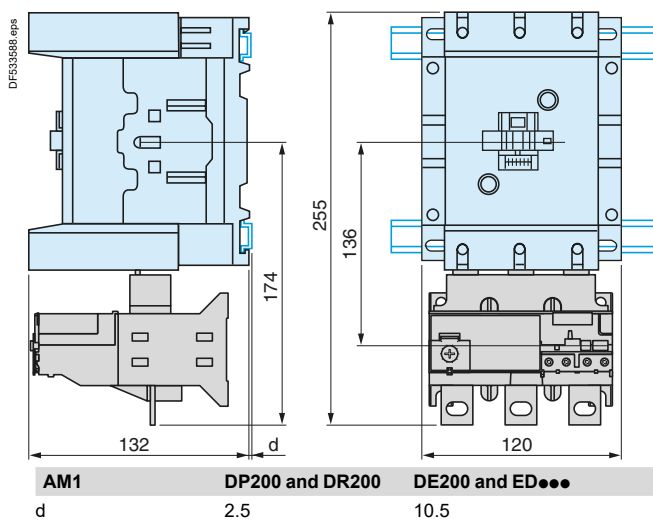


#### LR9D01...32



#### LR9D53●●, LR9D55●●, LR9D67, LR9D69

Direct mounting beneath contactors LC 1D115 and D150



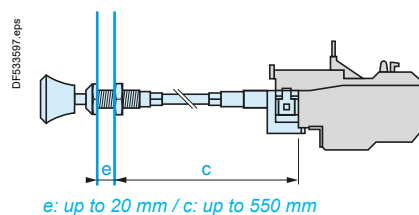
AM1 DP200 and DR200 DE200 and ED●●●  
d 2.5 10.5

#### LR9D

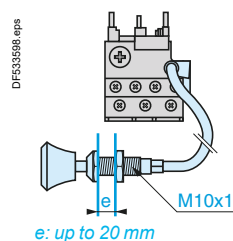
"Reset" by flexible cable

LA7D305 and LAD7305

Mounting with cable straight



Mounting with cable bent



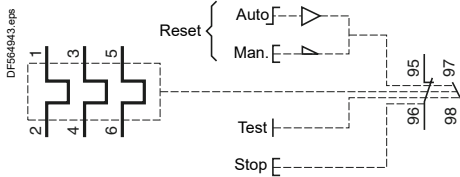


# TeSys

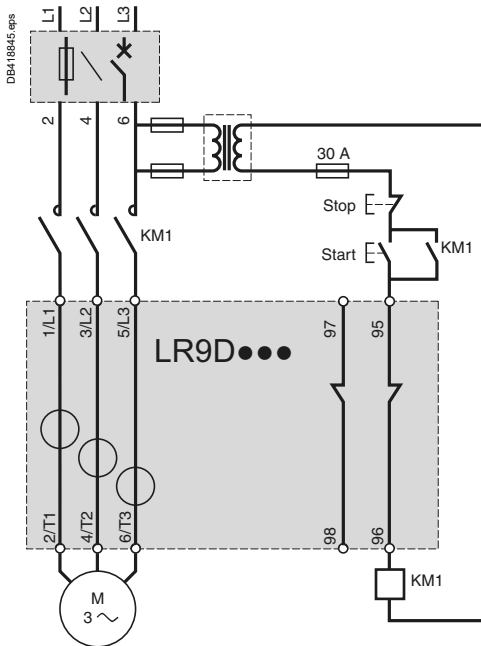
## TeSys LR9D Electronic overload relays

### Schemes

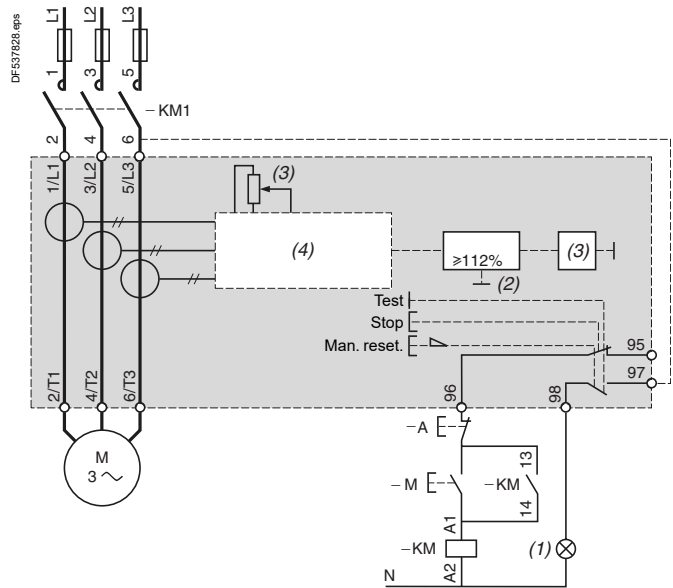
#### LR9D01, 02, 08, 32, LR9D110S



#### LR9D01, 02, 08, 32, LR9 D110S



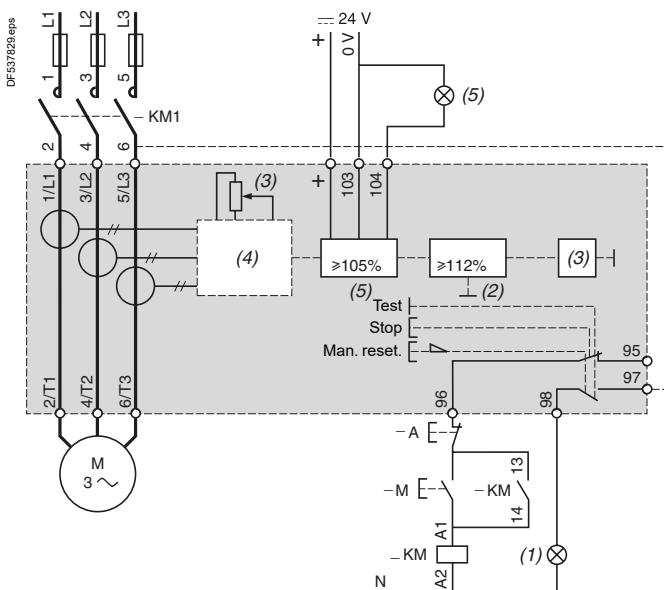
#### LR9D5...



(1) Tripped.  
(2) Overload.

(3) Setting current.  
(4) Specialised circuit.

#### LR9D67 and LR9D69



(1) Tripped.  
(2) Overload.  
(3) Setting current.  
(4) Specialised circuit.  
(5) Alarm.



#### Introduction

TeSys LR9F electronic protection relays are especially suited to the operating conditions of motors.

They provide protection against:

- thermal overload of 3-phase or single-phase balanced or unbalanced circuits;
- phase failure and large phase unbalance,
- protracted starting times,
- prolonged stalled rotor condition.

LR9F electronic protection relays are mounted directly below an LC1 F type contactor. They cover a range from 30 to 630 A, in eight ratings.

The settings can be locked by sealing the transparent protective cover.

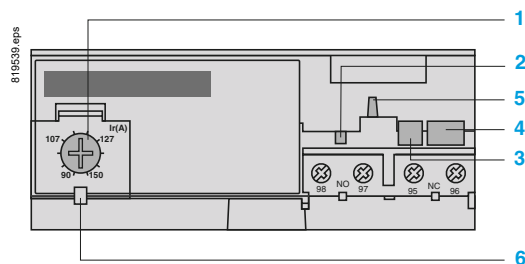
A reset button is mounted on the front of the relay.

Two versions are available:

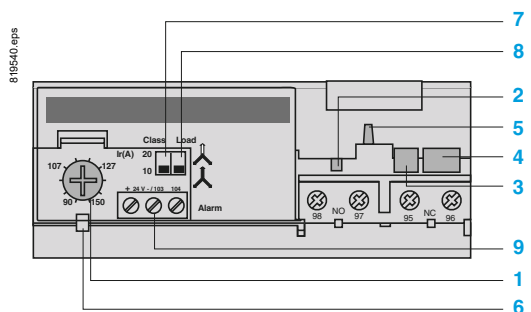
- simplified version: class 10: LR9F●3●●, class 20: LR9F●5●●,
- complete version: class 10, 10 A or class 20, selectable, conforming to EN 60947-4-1: LR9F●●.

This latter version includes an alarm function which makes it possible to forestall tripping by load shedding.

#### Simplified version: class 10 or 20



#### Complete version: class 10, 10 A or class 20, selectable, and alarm circuit



- 1 Ir adjustment dial
- 2 Test button
- 3 Stop button
- 4 Reset button
- 5 Trip indicator
- 6 Setting locked by sealing the cover
- 7 Class 10/class 20 selector switch
- 8 Selector switch for balanced load /unbalanced load
- 9 Alarm circuit

Ref.





# TeSys

## TeSys LR9F Electronic overload relays

### Characteristics

Environment			
Conforming to standards			IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.4
Product certifications			UL, CSA, CCC, ABS, BV, DNV-GL
Degree of protection	Conforming to VDE 0106		IP 20
	Conforming to IEC 60529		IP 20 on front of relay with accessories <b>LA9F103</b> or <b>LA7F70●</b> , see page B11/14
Climatic withstand			according to IACS E10
Ambient air temperature around the device (conforming to IEC 60255-8)	Storage	°C	-40...+85
	Normal operation	°C	-20...+55 <sup>(1)</sup>
Maximum operating altitude	Without derating	m	2000
Operating positions without derating	In relation to normal vertical mounting plane		Any position
Shock resistance	Permissible acceleration conforming to IEC 60068-2-7		13 gn - 11 ms
Vibration resistance	Permissible acceleration conforming to IEC 60068-2-6		2 gn - 5 to 300 Hz
Dielectric strength at 50 Hz	Conforming to IEC 60947-4-1	kV	6
Surge withstand	Conforming to IEC 61000-4-5	kV	4
Resistance to electrostatic discharge	Conforming to IEC 61000-4-2	kV	8 (in air) 6 (in indirect mode)
Resistance to radiated radio-frequency disturbance	Conforming to IEC 61000-4-3	V/m	10
Resistance to fast transient currents	Conforming to IEC 61000-4-4	kV	2
Electromagnetic compatibility	EN 50081-1 and 2, EN 50082-2		Conforming

<sup>(1)</sup> For operating temperatures up to 70 °C, please consult your Regional Sales Office.

Ref.



Overload  
relays



Electrical characteristics of power circuit									
Relay type			LR9	F5●57, F57		F5●63, F63 F5●67, F67F5●69, F69	F5●71, F71	F7●75, F75 F7●79, F79	F7●81, F81
Rated insulation voltage (Ui) Conforming to IEC 60947-4-1			V	1000					
Rated impulse withstand voltage (Uimp) Conforming to IEC 60947-1			kV	8					
Rated operational current (Ie)			A	30 to 630					
Short-circuit protection and coordination				See pages: A6/11, A6/12, A6/15 and A6/16					
Frequency limits		Of the operating current	Hz	50...60. For other frequencies, please consult your Regional Sales Office <sup>(1)</sup>					
Power circuit connections	Width of terminal lug		mm	20	25	25	30 LR9F7●75 and LR9F75 40 LR9F7●79 and LR9F79		40
	Clamping screw			M6	M8	M10	M10	M12	
	Tightening torque		N.m	10	18	35	35	58	
Auxiliary contact electrical characteristics									
Conventional thermal current			A	5					
Short-circuit protection		By gG or BS fuses or by circuit-breaker GB2CD10	A	5					
Control circuit connections	Flexible cable with cable end	1 conductor	mm²	Min. 1 x 0.75			Max. 1 x 2.5		
		2 conductors	mm²	2 x 1			2 x 1.5		
	Flexible cable without cable end	1 conductor	mm²	1 x 0.75			1 x 4		
		2 conductors	mm²	2 x 1			2 x 2.5		
	Solid cable	1 conductor	mm²	1 x 0.75			1 x 2.5		
		2 conductors	mm²	2 x 1			–		
	Tightening torque		N.m	1.2					
Maximum sealed current consumption of the coils of associated contactors (occasional operating cycles of contact 95-96)	a.c. supply	V	24	48	110	220	380	600	
		VA	100	200	400	600	600	600	
	d.c. supply	V	24	48	110	220	440	–	
		W	100	100	50	45	25	–	

<sup>(1)</sup> For applications involving the use of these overload relays with soft starters or variable speed drives, please consult your Regional Sales Office.

Ref.





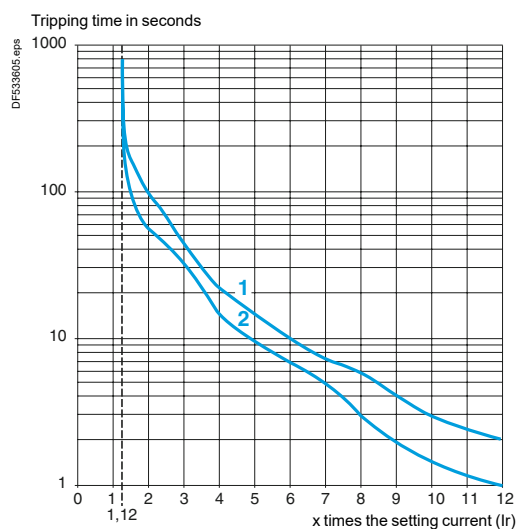
Operating characteristics				
Tripping class	Conforming to IEC 60947-4-1			10 and 20
Temperature compensation		°C		-20...+70
Reset				Manual on front of relay
Fault indication				On front of relay
Test function				On front of relay
Stop function				Actuation of N/C contact, without affecting N/O contact
Tripping thresholds	Conforming to IEC 60947-4-1	Alarm	A	$1.05 \pm 0.06 I_n$
		Tripping	A	$1.12 \pm 0.06 I_n$
Sensitivity to phase failure	Conforming to IEC 60947-4-1			Tripping in 4 s $\pm 20\%$ in the event of phase failure
Adjustment (nominal motor current)				Setting dial on front of relay
Security sealing				Yes

Alarm circuit characteristics				
Rated supply voltage	d.c. supply	V		24
Supply voltage limits		V		17...32
Current consumption	No-load	mA		$\leq 5$
Switching current		mA		0...150
Protection	Short-circuit and overload			Auto-protected
Voltage drop	Closed state	V		$\leq 2.5$
Connection	Flexible cable without cable end	mm <sup>2</sup>		0.5...1.5
Tightening torque		N.m		0.45

### LR9F tripping curve

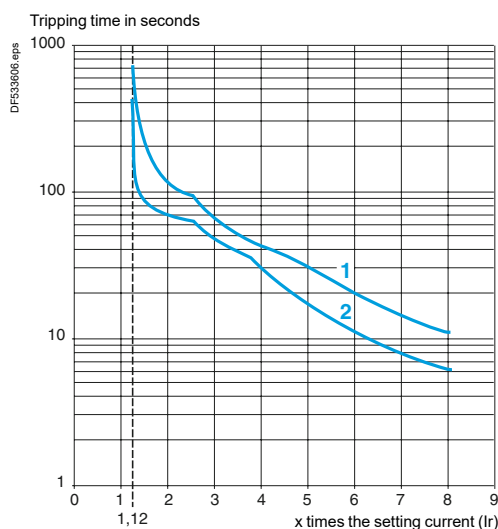
#### Average operating times depending on multiples of the setting current

#### Class 10



- 1 Cold state curve
- 2 Hot state curve

#### Class 20



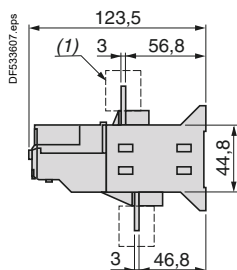


# TeSys

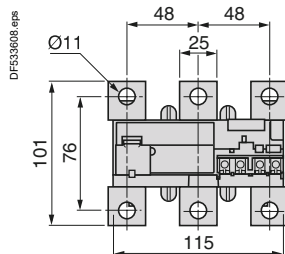
## TeSys LR9F Electronic overload relays

### Dimensions

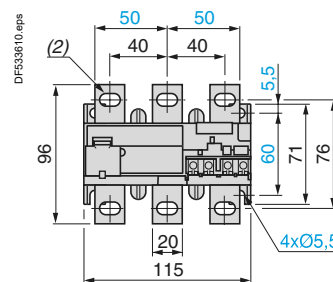
Common side view



LR9F57, F71

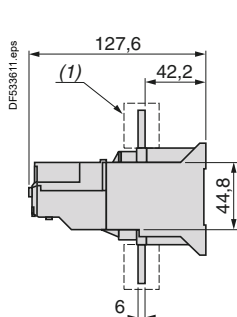


LR9F57, F563, F567, LR9F569, F57, F63, F67, F69



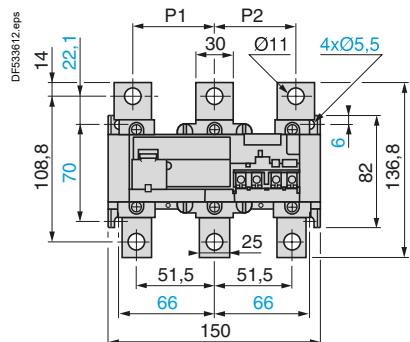
(1) Terminal shroud LA9F70

Common side view

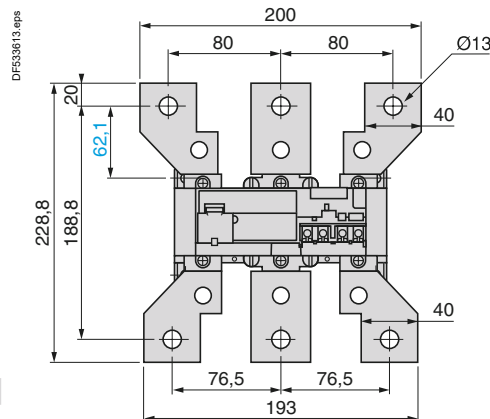


(2) 6.5 x 13.5 for LR9F57 and F57. 8.5 x 13.5 for LR9F563, F567, F569, F63, F67, F69

LR9F775, F779, F781, LR9F75, F79, F81



LR9F781 (for mounting beneath LC1F630 and F800), LR9F81



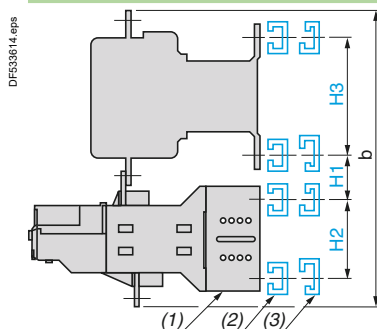
Ref.



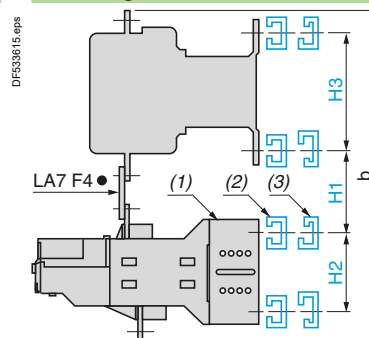
(1) Terminal shroud LA9F70

	P1	P2
LR9F775, F75	48	48
LR9F779, F781, F79, F81	55	55

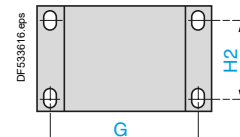
Direct mounting beneath contactor LC1F



Mounting beneath contactors: reversing LC2F or star-delta LC3F



Mounting plate for LR9F



LA7	G
F901	145
F902	190

Contactors LC1	With LR9 relays	b	H1	H2	H3
F115	F57, F563, F567, F569, F57, F63, F67, F69	240	30	50	120
F150	F57, F563, F567, F569, F57, F63, F67, F69	246	30	50	120
F185	F57, F563, F567, F569, F57, F63, F67, F69	250	30	50	120
F225	F571, F71	273	40	50	120
	F775, F779, F75, F79	308	50	58	120
F265	F571, F71	279	40	50	120
	F775, F779, F75, F79	314	60	58	120
F330	F775, F779, F75, F79	317	60	58	120
F400	F775, F779, F781, F75, F79, F81	317	60	58	180
F500	F775, F779, F781, F75, F79, F81	346	70	58	180
F630, F800	F781, F81	510	110	58	180

(1) Relay mounting plate LA7F90, see page B11/14.

(2) AM1EC or AM1DF for LC1F115 to F630 and LC1F800.

Contactors LC1	With LR9 relays	b	H1	H2	H3
F115	F57, F563, F567, F569, F57, F63, F67, F69	279	60	50	120
F150	F57, F563, F567, F569, F57, F63, F67, F69	283	60	50	120
F185	F57, F563, F567, F569, F57, F63, F67, F69	285	60	50	120
F225	F571, F71	360	100	58	120
	F775, F779, F75, F79	360	100	58	120
F265	F571, F71	332	90	50	120
	F775, F779, F75, F79	363	100	58	120
F330	F775, F779, F75, F79	364	100	58	120
F400	F775, F779, F781, F75, F79, F81	364	100	58	180
F500	F775, F779, F781, F75, F79, F81	390	110	58	180
F630, F800	F781, F81	509	120	58	180

(3) DZ5MB for LC1F115 to F400.



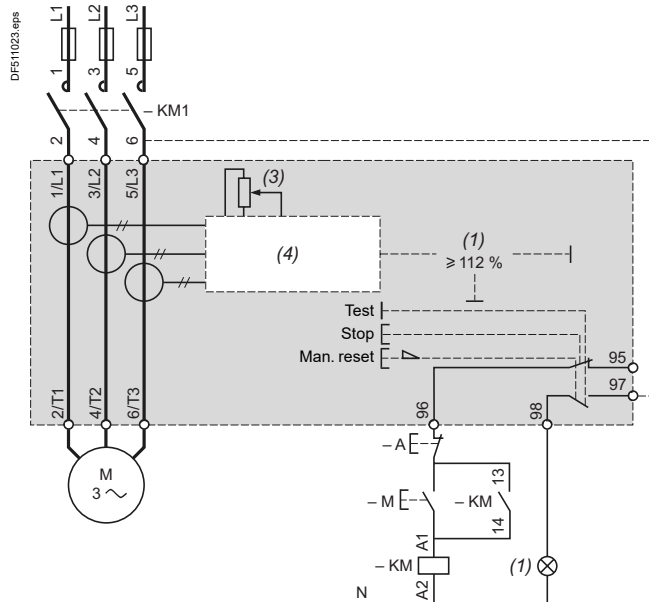
# TeSys

## TeSys LR9F Electronic overload relays

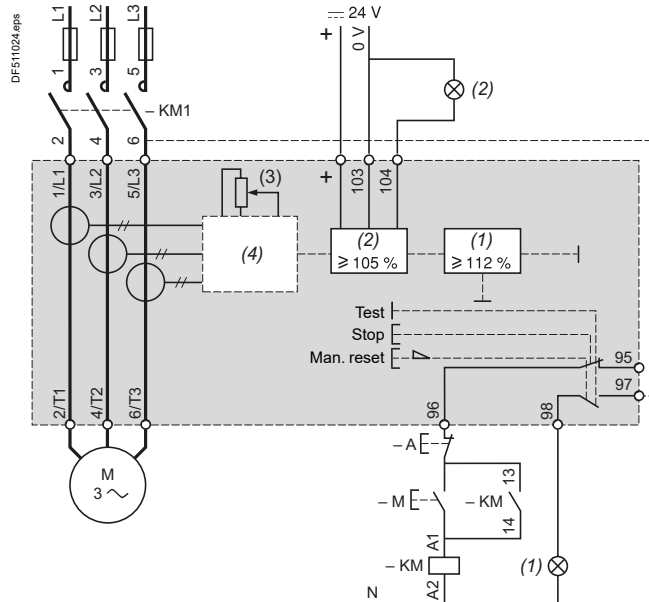
### Schemes, setting-up

#### Schemes

##### LR9F5...F7...F81



##### LR9F57...F81 (with alarm)

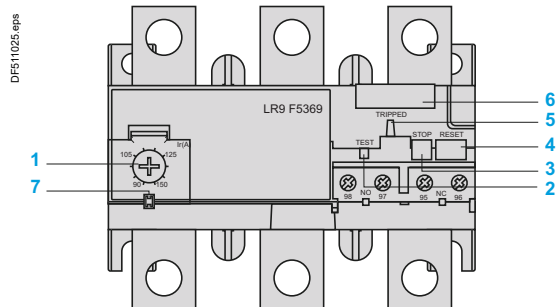


- (1) Tripped on thermal overload.
- (2) Overheating alarm.
- (3) Setting current.
- (4) Specialised circuit.

#### Setting-up the special functions of TeSys LR9F thermal overload relays

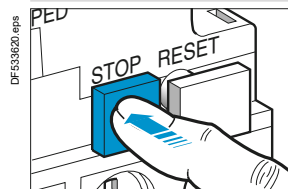
##### Setting the relay

- Lift the transparent cover 7 to gain access to the various settings.
- Adjustment is achieved by turning dial 1 which is graduated directly in Amperes.
- The setting can be locked by sealing the cover 7.



##### "Stop" function 3

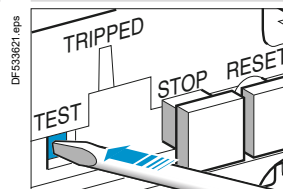
###### Stop



- The "Stop" function is obtained by pressing the red "STOP" button 3.
- Pressing the Test button:
  - ☐ actuates the N/C contact,
  - ☐ has no effect on the N/O contact.
- The "STOP" button can be locked by fitting a "U" clip (reference: LA7D901).

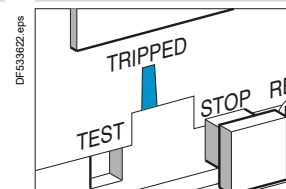
##### "Test" function 2

###### Test



- The "Test" function is obtained by pressing the red "TEST" button 2 with a screwdriver.
- Operation of the "TEST" button simulates tripping of the relay and:
  - ☐ actuates both the N/O and N/C contacts,
  - ☐ actuates the trip indicator 5.

###### Trip indicator





# TeSys

## TeSys RM1XA Magnetic overload relays

### Characteristics

#### Introduction

The RM1XA electromagnetic relay detects over current peaks in excess of the maximum permissible current value. It is designed for the protection of circuits which are not subject to current peaks (starters, resistors) or for controlling starting peaks on slip ring motors.

It trips instantaneously and is not suitable for frequent operation (12 operating cycles per hour). It can withstand a continuous current equivalent to 1.25 times the minimum setting current.

#### Environment characteristics

Conforming to standards		IEC/EN 60947-4-1
Ambient air temperature around the device	°C	Storage: - 60...+ 70 Operation: - 40...+ 60
Maximum operating altitude	m	2000
Operating position		± 15° in relation to normal vertical mounting position

#### Electrical characteristics of power circuit

Maximum rated operational voltage	V	~ or --- 600
Frequency limits of the rated operational current	Hz	0...60

#### Electrical characteristics of auxiliary contacts

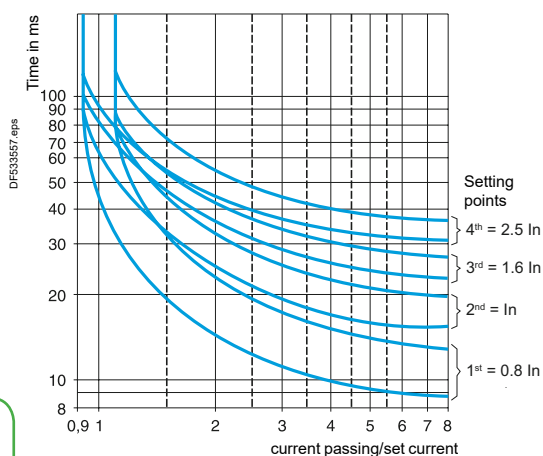
Conventional thermal current			A	10				
Occasional making and breaking capacities	a.c. supply	Voltage	V	48	110	220	380	600
		Power <sup>(1)</sup>	VA	4000	12 000	17 000	22 000	–
	d.c. supply	Voltage	V	48	110	220	440	600
		Power <sup>(2)</sup>	W	240	200	190	180	180

<sup>(1)</sup> Circuit such as the electromagnet of a contactor -  $\cos \phi$  inrush: 0.7 and  $\cos \phi$  sealed: 0.4.

<sup>(2)</sup> Circuit such as an electromagnet without economy resistor ; time constant varying from 20 ms for 5 W to 200 ms for 100 W or more.

#### Operating times

Operating times: because of the numerous applications for RM1 XA over current relays, it is not possible to give precise operating times. The curves shown are therefore purely indicative.



Overload relays



# TeSys

## TeSys RM1XA Magnetic overload relays

### Dimensions, schemes

#### Dimensions

RM1XA●●●,  
RM1XA●●●1

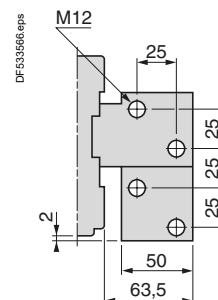
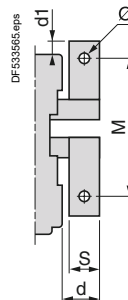
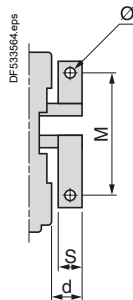
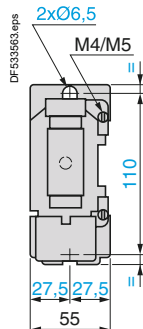
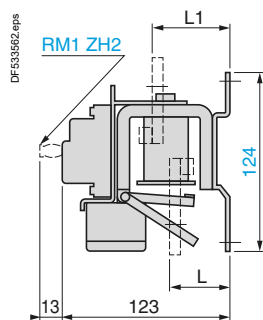
RM1XA001...XA040  
RM1XA0011...XA0401

RM1XA063, XA100  
and XA315  
RM1XA0631, XA1001  
and XA3151

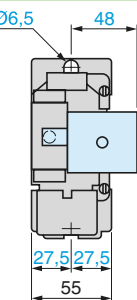
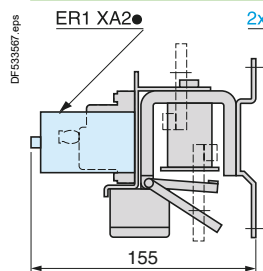
RM1XA160, XA200,  
and XA500  
RM1XA1601, XA2001,  
and XA5001

RM1XA101,  
RM1XA1011

Common side view



RM1XA●●●1 with electrical reset ER1XA2●



RM1	d	d1	M	L	L1	S	Ø
XA 063	20.5	—	83	25	40	15	M6
XA 100	20.5	—	87	25	40	20	M8
XA 160	27.5	5.5	94	25	40	25	M8
XA 200	27.5	5.5	94	25	40	25	M8
XA 315	35.5	—	74	44	55	30	M10
XA 500	40.5	7	84	44	55	40	M10
XA 101	—	—	—	37	64	—	—

#### Schemes

RM1XA●●●1

Latching

RM1XA●●●

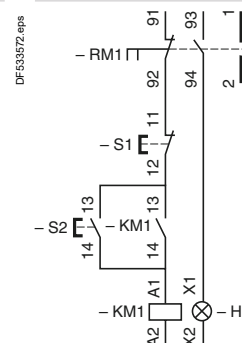
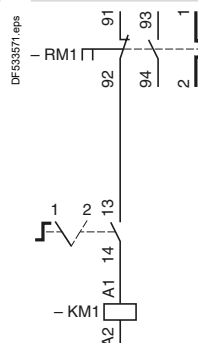
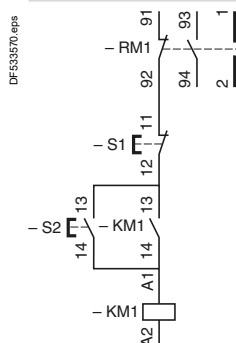
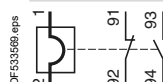
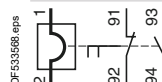
Non-latching

RM1XA

3-wire control (without  
mechanical latching)

2-wire control (with  
mechanical latching)

3-wire control  
(with "trip" signal)





Ref.



Overload  
relays

### Application

LT3S● thermistor protection units continuously monitor the temperature of the machines to be protected (motors, generators, etc.) by means of PTC thermistor probes embedded in the machine windings.

If the nominal operating temperature of the probes is reached, they convert the rapid increase in resistance into a switching function which can be used to switch off the machine or signal a fault (see paragraph relating to thermistor probes below).

Accidental breaks in the supply circuits of the thermistors are also detected.

### Electromagnetic compatibility

Conforming to "Electromagnetic compatibility" directive.

Conforming to standard IEC/EN 61000-6-2.

Resistance to electrostatic discharge (conforming to IEC 61000-4-2)	<b>Level 3</b>
Resistance to fast transients (conforming to IEC 61000-4-4)	<b>Level 3</b>
Susceptibility to electromagnetic fields (conforming to IEC 61000-4-3)	<b>Level 3</b>
Surge resistance 1.2/50 - 8/20 (conforming to IEC 61000-4.5)	<b>Level 4</b>
Immunity to microbreaks and voltage drops (IEC 61000-4-11)	
Suitable for use with variable speed controllers	

### Thermistor probes

Range of most commonly used PTC thermistor probes:

from 90 to 160 °C, in steps of 10 °C.

Curve  $R = f(\theta)$ , characteristic of a PTC thermistor probe, is defined by standard IEC 60947-8.

The choice of PTC thermistor probe to be incorporated in the motor winding depends on the insulation class, the type of motor and the most suitable location for the probe. This choice is usually made by the motor manufacturer or the motor rewinder, who have all the necessary information.

### Application example

Insulation class of rotating machines conforming to IEC 60034-11 (S1 duty)	NOT Nominal operating temperature	Temperature at which rapid increase in resistance occurs Probes used for	
		Alarm	Fault
	°C	°C	°C
A	100	100	100
B	110	110	120
E	120	120	130
F	140	140	150
H	160	160	170

(1) PTC: Positive Temperature Coefficient.



# TeSys

## TeSys LT3 Thermal protection units

### Characteristics

Protection unit type			LT3SE	LT3SA	LT3SM	
Reset method				Automatic	Automatic	Manual/Automatic
Fault indication				–	On front panel of unit and remote	On front panel of unit and remote
Fault test				–	–	By pushbutton on front panel of unit
Probe interchangeability				Label “Mark A” to IEC 60034-11	Label “Mark A” to IEC 60034-11	Label “Mark A” to IEC 60034-11
Environment						
Conforming to standards				IEC 60947-8	IEC 60947-8	IEC 60947-8
Product certifications				UL, CSA		
Degree of protection				IP 20 conforming to IEC 60529		
CE marking				LT3S● protection units have been designed to comply with the basic recommendations of European directives relating to low voltage and EMC. Therefore LT3S● products bear the European Community CE mark.		
Ambient air temperature around the device	Storage Conforming to IEC 60068-2-1 and 2-2	°C	- 40...+ 85			
	Operation	°C	- 25...+ 60			
Maximum operating altitude	Without derating		2000 m			
	With derating		Up to 3000 m, the maximum permissible ambient air temperature for operation (60 °C) must be reduced by 5 °C per additional 500 m above 1500 m			
Vibration resistance	Conforming to IEC 60068-2-6		2.5 gn (2...25 Hz) 1 gn (25...150 Hz)			
Shock resistance	Conforming to IEC 60068-2-27		5 gn (11 ms)			
Operating positions without derating	In relation to normal vertical mounting plane		Any position			
Power supply circuit characteristics						
Rated control circuit voltage (Uc)	~ 50/60 Hz	Single voltage	V	115 or 230	–	400
	0.85...1.1 Uc	Dual voltage	V	–	115/230	115/230, 24/48
	~ 50/60 Hz	Multivoltage	V	–	24...230	24...230
	0.85...1.1 Uc					
	---	Single voltage	V	24	–	–
	0.8...1.25 Uc	Dual voltage	V	–	24/48	24/48
	0.85...1.1 Uc	Multivoltage	V	–	24...230	24...230
Average consumption	Sealed	~	VA	< 2.5	< 2.5	< 2.5 except (400 V: 2.7)
		---	W	< 1	< 1	< 1

(1) PTC: Positive Temperature Coefficient.



# TeSys

## TeSys LT3 Thermal protection units

### Characteristics

#### Control circuit characteristics

Protection unit type			LT3SE	LT3SA	LT3SM
Resistance	Tripping	Ω	2700...3100	2700...3100	2700...3100
	Reset	Ω	1500...1650	1500...1650	1500...1650
Maximum number of probes fitted in series <sup>(2)</sup>	Probes ≤ 250 Ω at 25°		6	6	6
Voltage at terminals in the thermistor circuit	Normal operation (R = 1500 Ω)	V	< 2.5	< 2.5	< 2.5
	Conforming to IEC 60034-11 (R = 4000 Ω)	V	< 7.5	< 7.5	< 7.5
Thermistor probe short-circuit detection	Operating threshold	Ω	–	< 20	< 20
Connection of probes to the LT3	Distance	m	300	400	500
	Minimum c.s.a. of conductors	mm <sup>2</sup>	0.75	1	1.5
					2.5

#### Electrical characteristics of the output relay contacts

Contact type	Single voltage or dual voltage		1 N/C	1 N/C + 1 N/O	1 N/C + 1 N/O
	Multivoltage		–	2 C/O	2 C/O
Rated insulation voltage		V	~ 500		
Maximum operational voltage		V	~ 250 (~ 400 V for LT3SM00V)		
Rated impulse withstand voltage	Uimp	kV	2.5		
Conventional thermal current		A	5		
Operational power	At 220 V	VA	100 for 0.5 million operating cycles		
Breaking capacity	In cat. AC-15 120 V	A	6		
	250 V	A	3		
	In DC-13 24 V	A	2		
Cabling (cage type connector) for flexible or solid cable	Without cable end	mm <sup>2</sup>	2 x 1...1 x 2.5		
	With cable end	mm <sup>2</sup>	1 x 0.75...2 x 2.5		
Tightening torque		N.m	0.8		

#### Thermistor probe characteristics

Probe type			DA1TT●●●	DA1TS●●●
Conforming to standards			IEC 60034-11. Mark A	
Resistance	At 25 °C	Ω	3 x 250 in series	250
Rated operational voltage (Ue)	Per probe	V	~ 2.5 V max	~ 2.5 V max
Rated insulation voltage (Ui)		kV	2.5	1
Insulation			Reinforced	Reinforced
Length of connecting cables	Between probes	mm	250	–
	Between probe and motor terminal plate	m	1	1

(1) PTC: Positive Temperature Coefficient.

(2) Provided that the total resistance of the probe circuit is less than 1500 Ω at 20 °C.

(3) For distances greater than 500 m take cabling precautions (twisted shielded pairs).

Ref.



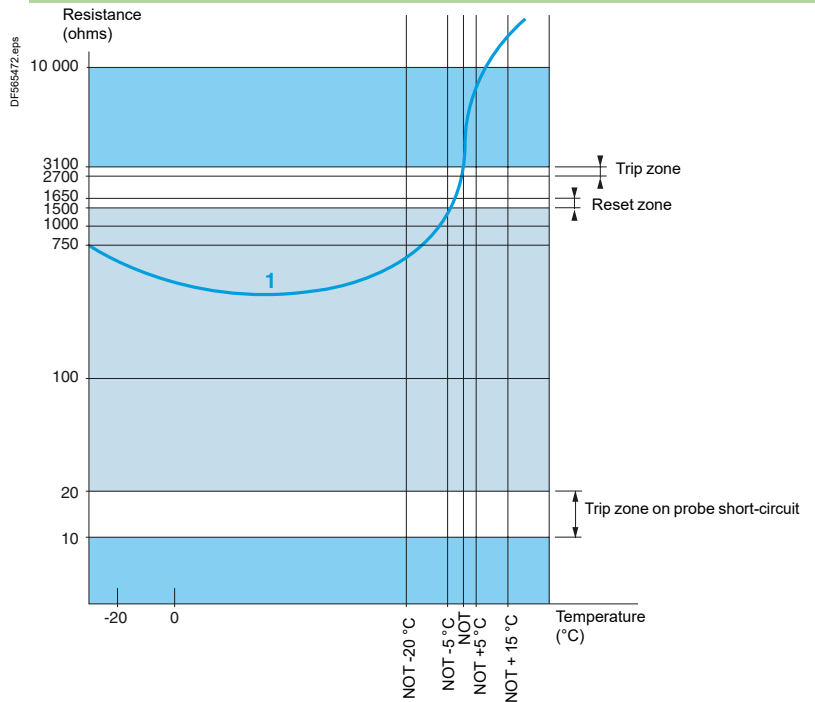
Overload relays



**LT3S protection unit/thermistor probe combination**

Guaranteed operating zones: examples with 3 probes type DA1TT●●● (250 Ω at 25 °C) in series, conforming to standard IEC 60034-11, Mark A.

**LT3SE, LT3SA, LT3SM protection units**



1 3 probes type DA1TT●●● (250 Ω at 25 °C) in series.

NOT: Nominal Operating Temperature

- Protection unit tripped.
- Protection unit reset.

(1) PTC: Positive Temperature Coefficient.

Ref.



Overload  
relays



# TeSys

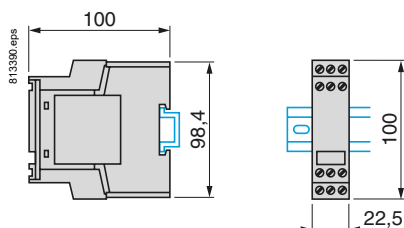
## TeSys LT3 Thermal protection units

### Dimensions, schemes, setting-up

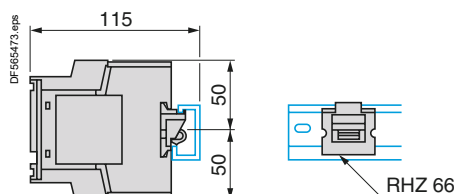
#### Dimensions

##### LT3SE, SA, SM

Mounting on  $\perp$  rail AM1 DP200



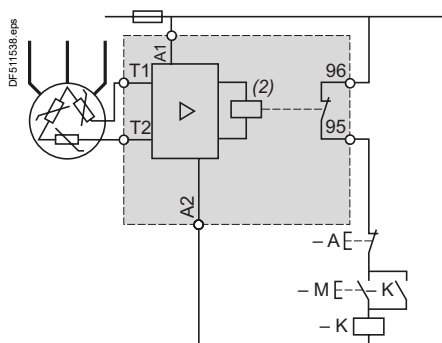
Mounting on 1  $\perp$  rail  
(with adapter RHZ 66)



#### Schemes for "no fault" operation

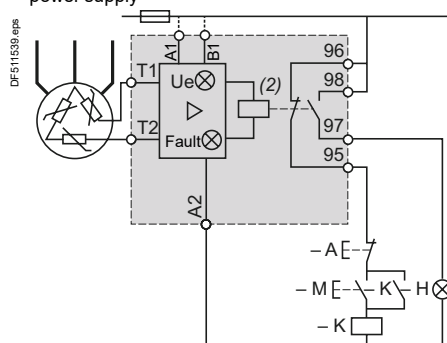
LT3SE00BD (24 V DC), LT3SE00F (115 V AC),  
LT3SE00M (230 V AC)

Without fault memory

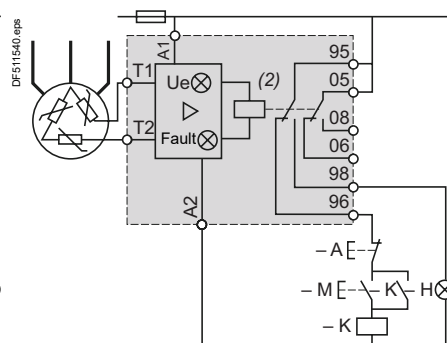


LT3SA00ED (24/48 V DC),  
LT3SA00M (115/230 V AC)

Refer to chart for use of A1/B1 terminal according  
power supply

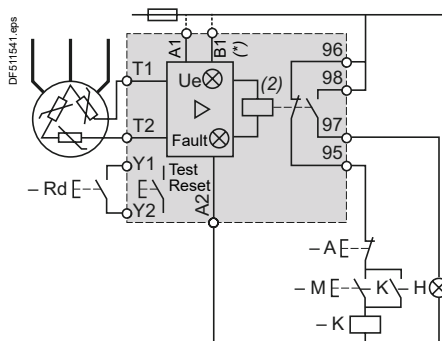


LT3SA00MW (24 to 230V AC/DC)

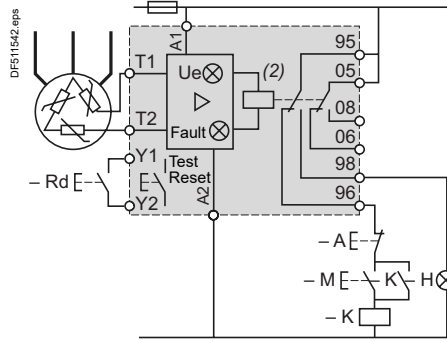


LT3SM00E (24/48V AC), LT3SM00ED (24/48V DC),  
LT3SM00M (115/230 V AC), LT3SM00V (400V AC)

Refer to chart for A1 - A2 - B1 supply terminals to be used



LT3SM00MW (24 to 230 V AC/DC)



LT3SA, LT3SM - dual voltage and 400 V -  
power terminal assignment

LT3SA00ED, LT3SM00ED	24 V DC	48 V DC
Terminals	B1(+) A2 (0V)	A1(+) A2 (0V)
LT3SA00M, LT3SM00M	115 V AC	230 V AC
Terminals	A1-B1	A1-A2
LT3SA00M, LT3SM00M	-	400 V AC
Terminals	-	A1-A2

(\*) no B1 terminal on LT3SM00V (400V AC).

#### Setting-up

##### Cabling

It is inadvisable to use the same multi-core cable for the thermistor probe circuit and the power circuit. This is especially important for long cable runs. If it is impossible to comply with the above recommendation, a pair of twisted conductors must be used for the thermistor probe circuit.

##### Testing the insulation of the line connecting the thermistors to the LT3S unit

Before carrying out this test, short-circuit all the terminals of the LT3S protection unit. Measure the insulation value between these terminals and earth using a megger or a flash tester, progressively increasing the voltage to the value defined by the standards.

##### Checking the PTC thermistor probes for correct operation

With the machine stopped, in the cold state and after having taken all the necessary safety precautions:

- disconnect the line linking the thermistors to the LT3S protection unit, at the terminals of the machine being protected: motor, etc.,
- using an ohmmeter with a voltage rating less than or equal to 2.5 V, measure the resistance of the probe circuit at the machine terminals,
- depending on the number and type of thermistors connected in series, check that their resistance value at 25 °C is correct.

Example: motor fitted with 3 PTC thermistor probes with a resistance  $\leq 250 \Omega$  at 25 °C.

Any value higher than  $250 \times 3 = 750 \Omega$  indicates a problem.

(1) PTC: Positive Temperature Coefficient.

(2) Relay energised: the contacts are shown in the "operating" position.

References:

pages B11/17 and B11/18

Characteristics:

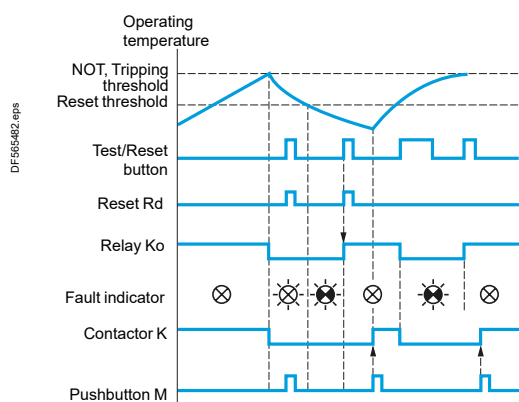
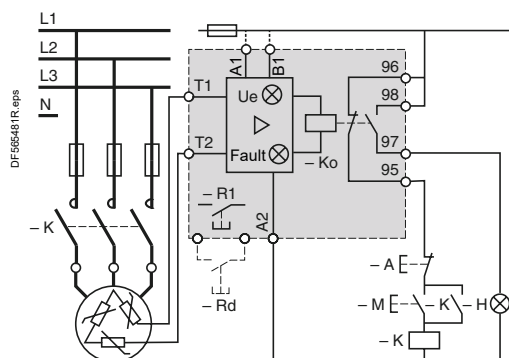
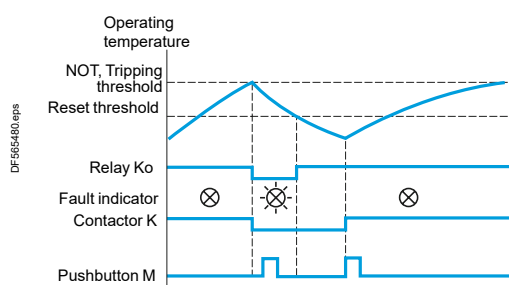
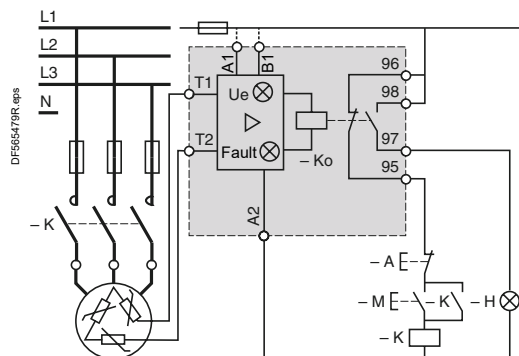
pages B11/52 to B11/55



# TeSys

## TeSys LT3 Thermal protection units

### Schemes, operation



### LT3SA protection units

#### Starting

The LT3SA is normally energised and its internal relay is in the pre-energised position. The motor is started by operating pushbutton M automatically held in by K (3-wire control circuit).

#### Thermal fault

The strong increase in resistance of the PTC probes at the moment their temperature reaches the nominal operating temperature (NOT) is detected by the LT3SA unit and causes the relay to drop out; indicator H comes on, as does the built-in indicator on unit LT3SA.

Contactor K drops out and pressing button M has no effect.

#### Reset

As the motor cools, it reaches the reset threshold, 2 to 3 °C below the nominal operating temperature.

The relay resets and the motor can be started by pressing button M.

### LT3SM protection units

Operation is very similar to that described above, except for the following:

#### Reset

After tripping on thermal fault and cooling to the reset threshold, the Test/RESET button on the unit (R1) or a remote reset button (Rd) must be pressed to energise the relay.

The fault is therefore memorised, even though the temperature of the probes has dropped to well below the reset threshold.

#### Signalling circuit

As the relay is fitted with 2 separate contacts, the signalling voltage may be different from the contactor control voltage.

#### Test

Pressing the Test/RESET button simulates a fault and causes the relay to drop out: the FAULT indicator comes on, as does the remote signalling indicator. The unit is reset by pressing the Test/RESET button again.

(1) PTC: Positive Temperature Coefficient.



# TeSys

## TeSys LR97, LT47 Electronic over current relays

### Characteristics

#### Introduction



LR97D



LT47

LR97D and LT47 electronic over current relays have been developed to satisfy machine protection requirements. These relays have definite time characteristics: current threshold and time based function. They are particularly recommended for providing mechanical protection on machines with high resistive torque, high inertia and with strong probability of jamming under steady state conditions. They can be used for motor protection in the case of long starting times or frequent starting. The LR97D relay also incorporates two fixed time protection functions, one of 0.5 seconds against locked rotor and one of 3 seconds against phase failure. LR97D and LT47 can be used to provide mechanical shock protection. In this case, setting the O-Time knob to minimum will ensure tripping in 0.3 seconds. TeSys LR97D is designed to be directly connected downstream of the TeSys D contactor. TeSys LT47 provides two current transformers, to be crossed by the motor power cables.

#### Applications

LR97D and LT47 relays are particularly suitable for the following machines:

- Monitoring function for excessively long starting time on machines with a risk of difficult starting:
  - Machines with high resistive torque, high inertia machines.
- Monitoring of machines during steady state operation: overtorque detection function
  - Machines with strong risk of jamming, machines with torque build-up over time,
  - Mechanical failure monitoring,
  - Faster detection of malfunctioning on machines where the motor is oversized in relation to its thermal protection I<sup>2</sup>t.
- Motor protection for specific applications:
  - Machines with long starting times,
  - Machines with high on-load factor: more than 30 to 50 starts/hour,
  - Machine with fluctuating load from a steady state, where the thermal image of a thermal overload relay (thermal memory) is unsuitable in relation to actual overheating of the motor.

#### Examples of machines:

- Conveyors, crushers and mixers,
- Fans, pumps and compressors,
- Centrifuges and spin-dryers,
- Presses, shearing machines, saws, broaching machines, sanders and lifting hoists.

#### Operation

Because of their two separate time settings, LR97D and LT47 relays can be combined with the motor-starter function:

D-Time: starting time, O-Time: trip time during steady state.

The D-Time function is only available during the motor starting phase. During this phase the overload detection function is inhibited in order to allow starting. Under steady state conditions, when the motor current is greater than the setting current due to an overload or single-phasing, the red LED lights up and the internal relay switches its contact after a time preset by the O-Time knob.

The red LED stays on, indicating that the relay has tripped.

The relays are simple to set, in 5 easy steps:

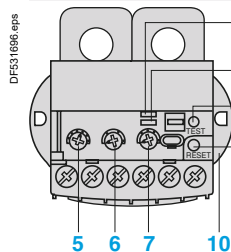
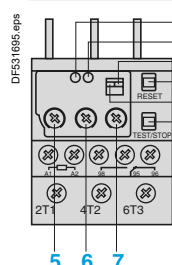
- Adjust the 3 knobs to maximum (Load, D-Time and O-Time),
- Adjust the D-Time knob to the value corresponding to the motor starting time.
- When the motor reaches steady state, adjust the Load knob (turn the knob counter-clockwise until the red LED starts to flicker).
- Slowly turn the Load knob clockwise until the LED goes out.
- Set the required tripping time, using the O-Time knob.

#### Description

##### Description

LR97D●●●●●

LT47●●●●●



- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>1 RESET knob</li> <li>2 TEST/STOP knob</li> <li>3 Ready/Run Indicator</li> <li>4 Relay tripped indicator</li> <li>5 Current setting</li> <li>6 Adjustment of starting time</li> </ul> | <ul style="list-style-type: none"> <li>7 Adjustment of tripping time</li> <li>8 Manual/Auto adjustment</li> <li>9 Single-phase/3-phase adjustment</li> <li>10 Retractable fixing lugs</li> </ul> |
|--|--|

##### Status signalling

LR97D●●●●●

LT47●●●●●

To assist fast diagnostics, two LEDs (one green and one red) allow signalling of the operating status:

Status	LED signal	
	Green LED	Red LED
Voltage	On	Off
Starting		
Steady state	On	Off
Overload	On	
Trip	Over-current	Off
	Rotor locked	Off
	Phase failure	L1 Off
		L2 Off
		L3 Off

Condition	LED signal	
	Green LED	Red LED
Voltage	On	Off
Starting		
Steady state	On	Off
Overload	On	
Trip	Off	On



# TeSys

## TeSys LR97, LT47 Electronic over current relays

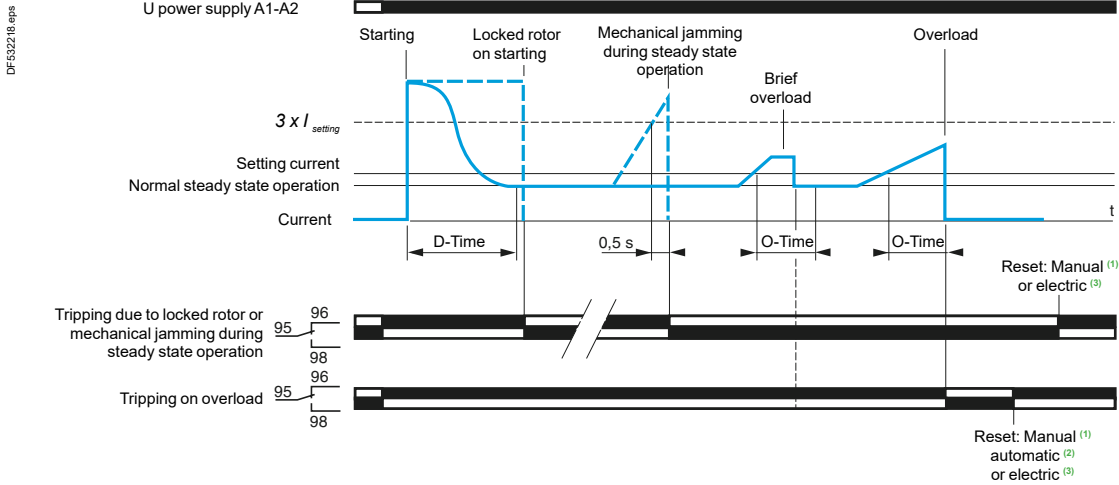
### Characteristics

#### Curves

##### LR97D

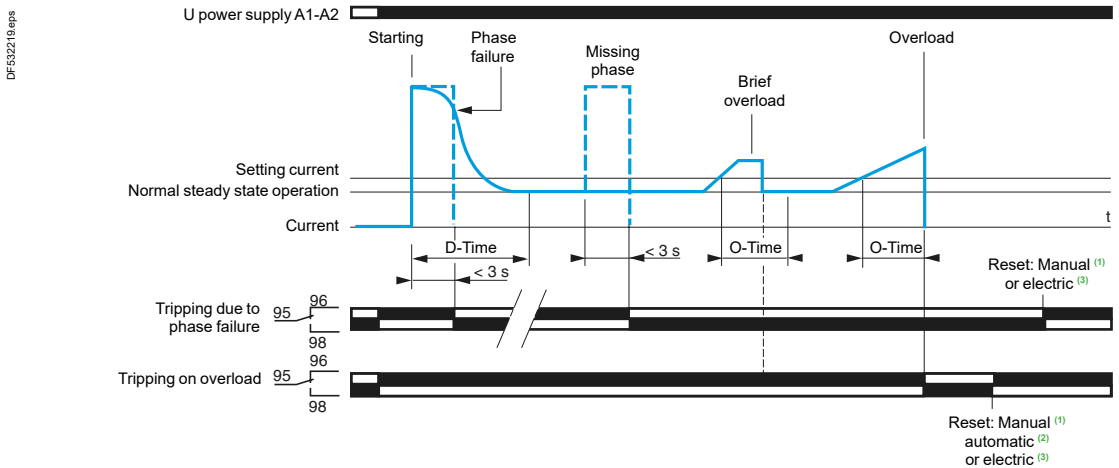
##### Overload protection

##### Protection against locked rotor and mechanical jamming under steady state conditions

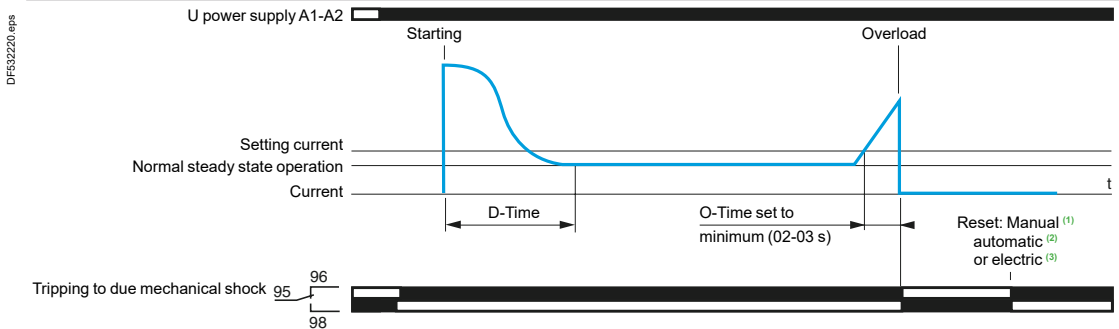


##### Overload protection

##### Protection against phase failure during starting and during steady state operation



##### Mechanical shock protection



(1) By Reset button.

(2) Fixed time of 120 s. Selectable by dip switch. Function not available in the event of tripping due to locked rotor/mechanical jamming ( $I > 3 \times I_{\text{setting}}$ ) or phase failure.

(3) By brief interruption of power supply, minimum 0.1 s.



# TeSys

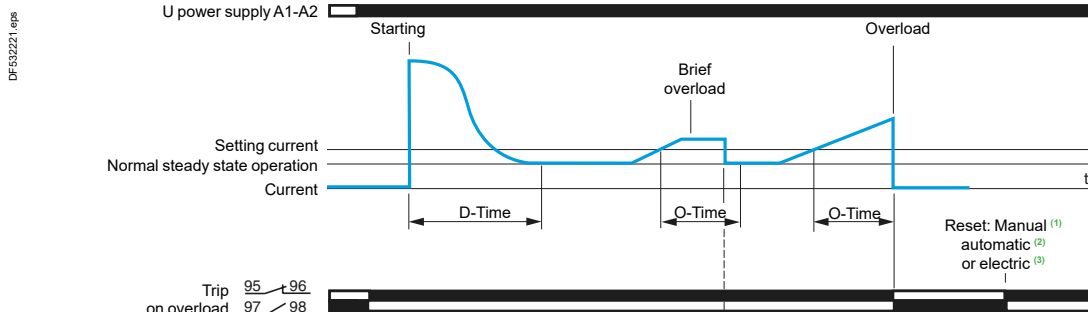
## TeSys LR97, LT47 Electronic over current relays

### Characteristics

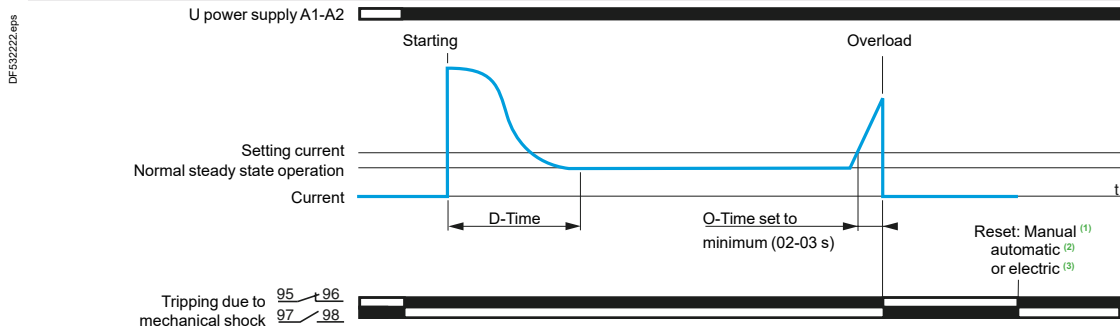
#### Curves

##### LT47

##### Overload protection



##### Mechanical shock protection



(1) By Reset button.

(2) Only available on version with automatic reset (LT47●●●●A). Time adjustable from 1 to 120 s with the R-Time knob.

(3) By brief interruption of power supply, minimum 0.1 s.

#### Characteristics

##### Environment

Relay type		LR97D●●●●●	LT47●●●●●
Conforming to standards		IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5	IEC/EN 60947-4-1, IEC/EN 60947-5-1, UL 60947-4-1, CSA C22.2 n° 60947-4-1, UL 60947-5-1, CSA C22.2 n° 60947-5-1, GB/T 14048.5
Product certifications		UL, CSA, CCC, EAC	UL, CSA, CCC, EAC
Degree of protection	Conforming to IEC 60529	IP 20 (front face)	IP 20 (front face)
Ambient air temperature around the device	Storage	°C - 30...+ 80	- 30...+ 80
	Normal operation without derating (IEC 60947-4-1)	°C - 25...+ 60	- 25...+ 60
Maximum operating altitude	m	2000	2000
Operating positions without derating	In relation to normal vertical mounting plane	Any position	Any position
Shock resistance	Permissible acceleration conforming to IEC 60068-2-27	15 gn - 11 ms	15 gn - 11 ms
Vibration resistance	Permissible acceleration conforming to IEC 60068-2-6	4 gn	4 gn
Dielectric strength at 50 Hz	Conforming to IEC 60947-4-1	kV 2	2
Surge withstand	Conforming to IEC 61000-4-5	kV 6	6
Resistance to electrostatic discharge	In open air	kV 8 (level 3)	8 (level 3)
	In direct mode	kV 6 (level 3)	6 (level 3)
Immunity to radiated radio-frequency disturbance		V/m 10 (level 3)	10 (level 3)
Immunity to fast transient currents		kV 2	2
Conducted emissions	Conforming to EN 55011	Class A	Class A
Conducted HF disturbance	Conforming to EN 61000-4-6	V 10	10

References:  
page B11/19

Dimensions, mounting:  
page B11/62

Schemes:  
page B11/62

B11/60

Life Is On

Schneider  
Electric

Ref.



Overload  
relays

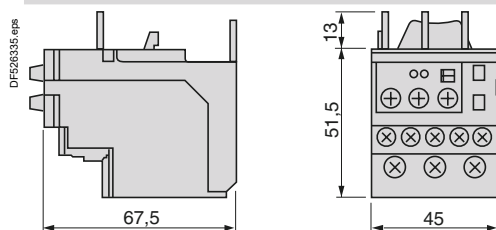


Characteristics											
Auxiliary contact characteristics											
Relay type				LR97D●●●●●				LT47●●●●●			
Contact type					1 NO/NC				1 N/O + 1N/C		
Conventional thermal current				A	3				3		
Maximum hold consumption of controlled contactor coils (occasional operating cycles of contact 95-96)	Conforming to IEC 60947		V	~ 24	~ 48	~ 110	~ 220	~ 24	~ 48	~ 110	~ 220
			VA	70	140	360	360	70	140	360	360
			V	--- 24	--- 48	--- 110	--- 220	--- 24	--- 48	--- 110	--- 220
			W	55	55	28	28	55	55	28	28
Short-circuit protection		By gG, BS fuses. Maximum rating or GB2 circuit breaker		A	3				3		
Connection by cable or lug-clamps											
Flexible cable without cable end	1 or 2 conductors	Min.	mm <sup>2</sup>	1 x 0.75				1 x 1			
		Max.	mm <sup>2</sup>	2 x 2.5				2 x 2.5			
Flexible cable with cable end	1 or 2 conductors	Min.	mm <sup>2</sup>	1 x 0.34				1 x 1			
		Max.	mm <sup>2</sup>	1 x 1.5 + 1 x 2.5				2 x 2.5			
External Ø of lugs			mm	7				7			
Ø of screw			mm	M3				M3.5			
Tightening torque			N.m	0.6...1.2				0.8...1.7			
Electrical characteristics of power circuit											
Relay type				LR97D015●● to LR97D25●●		LR97D38●●		LT47●●●●●			
Setting range		Depending on model		A	0.3...38			0.5...60			
Tripping class					Adjustable			Adjustable			
Rated insulation voltage (Ui)	Conforming to IEC 60947-4-1		V	690			690				
	Conforming to UL, CSA		V	600			600				
Rated impulse withstand voltage (Uimp)				kV	6			6			
Frequency limits		Of the operating current		Hz	50...60			50...60			
Connection by cable or lug-clamps											
Flexible cable without cable end	1 conductor	Min.	mm <sup>2</sup>	1.5		2.5		—			
		Max.		10		10		—			
Flexible cable with cable end	1 conductor	Min.	mm <sup>2</sup>	1		1		—			
		Max.		4		6		—			
External Ø of lugs			mm	10		12		—			
Ø of screw			mm	M4		M4		—			
Tightening torque			N.m	2		2		—			
Operating characteristics											
Relay type				LR97D●●●●●			LT47●●●●S		LT47●●●●A		
Adjustment	Current		A	"Load" knob			"Load" knob		"Load" knob		
	Time	D-time knob	s	0.5...30			0.5...30		—		
		O-time knob	s	0.2/0.3...10			0.2/0.3...10		0.2/0.3...30		
		R-time knob	s	—			—		1...120		
Reset	Manual			Reset button			Reset button		Reset button		
	Automatic			120 s fixed			—		R-time knob: 1-120 s		
	Electrical			By interruption of power supply (minimum 0.1 s)			By interruption of power supply (minimum 0.1 s)		By interruption of power supply (minimum 0.1 s)		
Protection functions					On starting	Steady state	On starting	Steady state	—		
Overload $I_{max} > I_{setting}$	Tripping			Inhibited during D-time	After O-time	Inhibited during D-time	After O-time	After O-time			
Locked rotor, mechanical jamming $I > 3 \times I_{setting}$	Tripping			After D-time	< 0.5 s	Inhibited during D-time	After O-time	After O-time			
Sensitivity to phase failure	Tripping			< 3 s	< 3 s	Inhibited during D-time	After O-time	After O-time			
Status and fault signalling (see table page 24517/2)					2 LEDs			2 LEDs		2 LEDs	
TEST/STOP function	Test			No load			No load		No load		
	Stop			Under load			Under load		Under load		
Sealing					Yes			Yes		Yes	

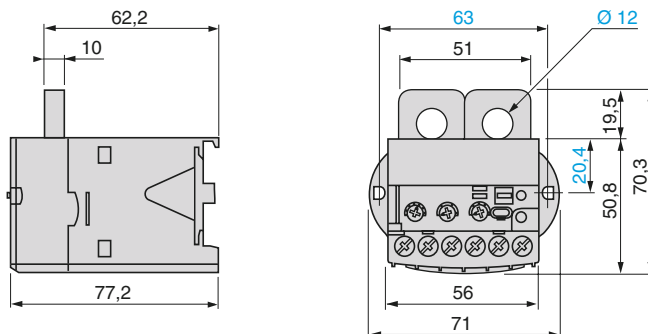


#### Dimensions

##### LR97D●●●●



##### LT47●●●●

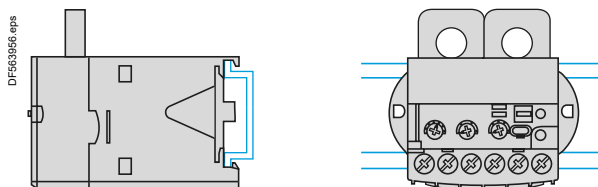
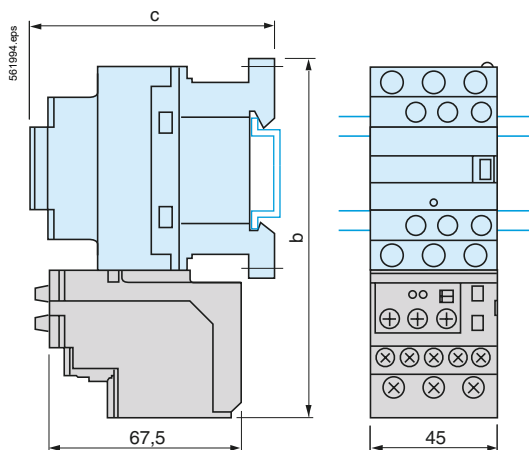


#### Mounting

##### LR97D●●●●

Direct mounting beneath the contactor

##### LT47●●●●

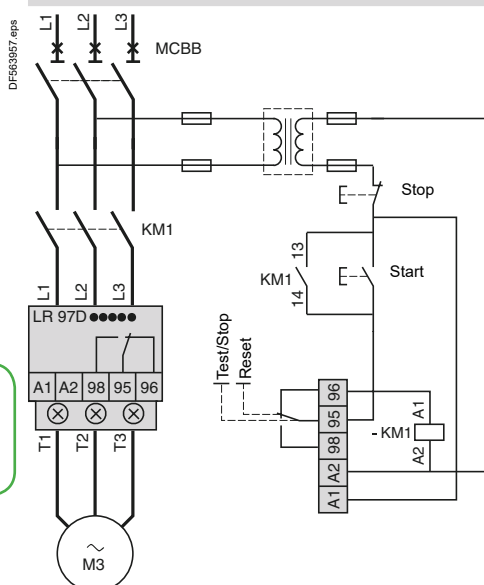


LC1	D09...D18	D25...D38
b	123	137
c	See pages B8/76 and B8/77	

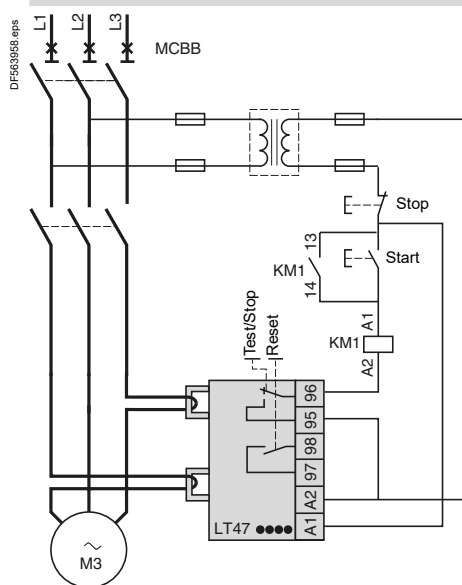
Note: Can be mounted on rail.

#### Schemes

##### LR97D●●●●



##### LT47●●●●



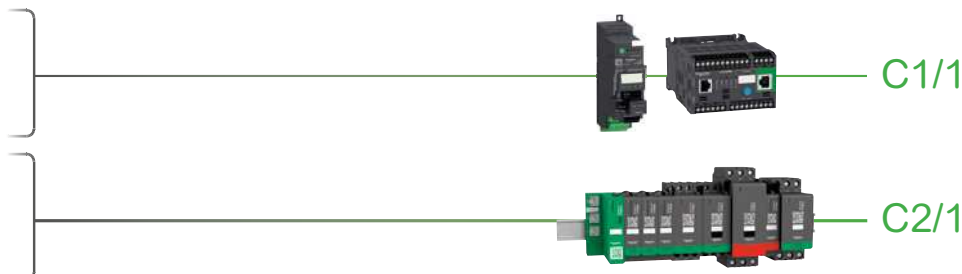


# Part C

## COMPONENTS FOR MOTOR MANAGEMENT SYSTEMS

**TeSys U, T**  
Motor management

**TeSys™ island**  
Digital management



Motor  
management  
devices


Control and  
monitoring  
island







### TeSys U Motor management system

Type of product	Range	Pages
TeSys U Motor controller		C1/2
Current transformers for TeSys U motor controller	From 30 to 800 A	C1/2
Type 2 coordination table for assemblies of: ■ circuit breaker + contactor + TeSys U controller + current transformer ■ fuses + contactor + TeSys U controller + current transformer		C1/3

Motor  
management  
devices

### TeSys T Motor management system

Controllers with Modbus, or CANopen, Devicenet, Profibus, Ethernet TCP/IP communication port		C1/4
Extension modules		C1/5
HMI terminal and cables		C1/5
Accessories		C1/6

Technical Data for Designers

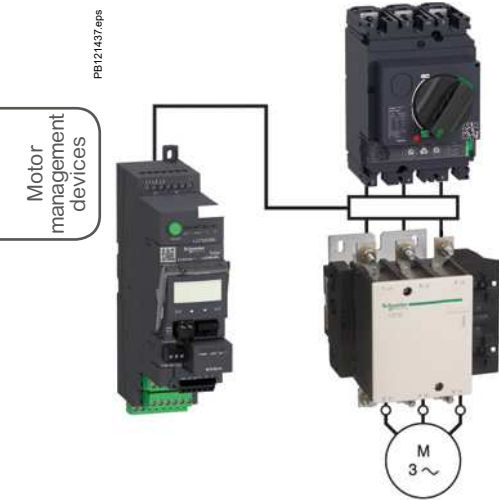
C1/13



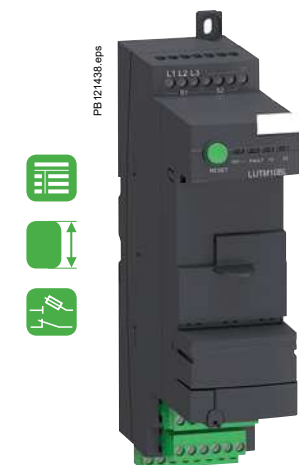
# TeSys

## TeSys U Motor management controller

### Product references



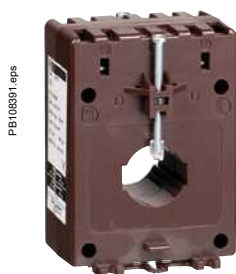
LUTM + LUCMT1BL + LUTC●●



LUTM10BL



LUCMT1BL



LUTC●●●

#### References

##### Control bases (auxiliary supply voltage $\sim$ 24 V)

Connection	Control	For use with contactor	Reference	Weight kg
Screws	Screws	LC1D●●	LUTM10BL	0.800
		LC1F●●●	LUTM20BL	0.800

##### Control units

Description	Class	For motor type	Setting range	Reference	Weight kg
Advanced	10	3-phase	0.35...1.05	LUCBT1BL	0.140
	20	3-phase	0.35...1.05	LUCDT1BL	0.140
Multifunction	5 to 30	3-phase	0.35...1.05	LUCMT1BL	0.175

##### Current transformers

Operating current		Reference	Weight kg
Primary	Secondary		
30	1	LUTC0301	0.550
50	1	LUTC0501	0.330
100	1	LUTC1001	0.450
200	1	LUTC2001	0.590
400	1	LUTC4001	0.870
800	1	LUTC8001	1.210

##### Function modules and communication modules

The TeSys U controller is compatible with the modules listed below:

- Thermal overload alarm module LUFW10,
- Motor load indication module LUFV2,
- Communication modules:
  - Modbus (LULC033),
  - CANopen (LULC08),
  - DeviceNet (LULC09),
  - Advantys STB (LULC15).

**Note:** Communication modules **LULC07** (Profibus DP), **ASILUFC5** and **ASILUFC51** (AS-Interface) are not compatible with the TeSys U controller.  
Module **LUFW10** is only compatible with control units **LUCBT1BL** and **LUCDT1BL**.



# TeSys

## TeSys U Motor management controller

### Product references

#### Combinations providing type 2 coordination

##### With Circuit breaker

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 400/415 V		Circuit breaker			Contactor	TeSys U controller	Current transformers
PkW	IeA	Reference	Rating A	Irm <sup>(1)</sup> A	Reference <sup>(2)</sup>	Reference	Reference
18.5	35	GV3L40	40	560	LC1D50A	LUTM + LUC●	3 x LUTC0501
22	41	GV3L50	50	700	LC1D50A	LUTM + LUC●	3 x LUTC1001
30	55	GV3L65	65	910	LC1D65A	LUTM + LUC●	3 x LUTC1001
37	66	GV4L80	80	1040	LC1D80	LUTM + LUC●	3 x LUTC1001
45	80	NSX100HMA	100	1300	LC1D95	LUTM + LUC●	3 x LUTC1001
55	97	NSX160HMA	150	1350	LC1D115	LUTM + LUC●	3 x LUTC2001
75	132	NSX160HMA	150	1800	LC1D150	LUTM + LUC●	3 x LUTC2001
90	160	NSX250HMA	220	2200	LC1F185	LUTM + LUC●	3 x LUTC2001
110	195	NSX250HMA	220	2640	LC1F225	LUTM + LUC●	3 x LUTC4001
132	230	NSX400HMA	320	3200	LC1F265	LUTM + LUC●	3 x LUTC4001
160	280	NSX400HMA	320	4160	LC1F330	LUTM + LUC●	3 x LUTC4001
200	350	NSX630HMA	500	5000	LC1F400	LUTM + LUC●	3 x LUTC4001
220	385	NSX630HMA	500	5500	LC1F400	LUTM + LUC●	3 x LUTC4001
250	430	NSX630HMA	500	6000	LC1F500	LUTM + LUC●	3 x LUTC8001

##### With fuses

Standard power ratings of 3-phase motors 50-60 Hz in category AC-3 400/415 V		Switch-disconnector fuse	aM fuses		Contactor	TeSys U controller	Current transformers
PkW	IeA	Reference	Size	Rating A	Reference <sup>(2)</sup>	Reference	Reference
18.5	35	GS●F	14 x 51	40	LC1D40A	LUTM + LUC●	3 x LUTC0501
22	41	GS●J	22 x 58	50	LC1D50A	LUTM + LUC●	3 x LUTC1001
30	55	GS●J	22 x 58	80	LC1D80	LUTM + LUC●	3 x LUTC1001
37	66	GS●J	22 x 58	100	LC1D80	LUTM + LUC●	3 x LUTC1001
45	80	GS●J	22 x 58	100	LC1D95	LUTM + LUC●	3 x LUTC1001
55	97	GS●L	T0	125	LC1D115	LUTM + LUC●	3 x LUTC2001
75	132	GS●L	T0	160	LC1D150	LUTM + LUC●	3 x LUTC2001
90	160	GS●N	T1	200	LC1F185	LUTM + LUC●	3 x LUTC2001
110	195	GS●N	T1	250	LC1F225	LUTM + LUC●	3 x LUTC4001
132	230	GS●QQ	T2	315	LC1F265	LUTM + LUC●	3 x LUTC4001
160	280	GS●QQ	T2	400	LC1F330	LUTM + LUC●	3 x LUTC4001
200	350	GS2S	T3	500	LC1F400	LUTM + LUC●	3 x LUTC4001
220	385	GS2S	T3	500	LC1F400	LUTM + LUC●	3 x LUTC4001
250	430	GS2S	T3	500	LC1F500	LUTM + LUC●	3 x LUTC8001
315	540	GS2S	T3	630	LC1F630	LUTM + LUC●	3 x LUTC8001

(1) Irm: setting current of the magnetic trip.

(2) For reversing operation, replace the prefix LC1 with LC2.

Motor  
management  
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# TeSys

## TeSys T Motor management system

### Product references

Motor  
management  
devices



LTMR08MBD



LTMR08CBD



LTMR08DBD



LTMR08PBD



LTMR08EBD

Controllers			
Setting range	Control voltage	Current range	Reference
A	V	A	
For Modbus			
8	24 ~ 100...240	0.4...8 0.4...8	LTMR08MBD LTMR08MFM
27	24 ~ 100...240	1.35...27 1.35...27	LTMR27MBD LTMR27MFM
100	24 ~ 100...240	5...100 5...100	LTMR100MBD LTMR100MFM
For CANopen			
8	24 ~ 100...240	0.4...8 0.4...8	LTMR08CBD LTMR08CFM
27	24 ~ 100...240	1.35...27 1.35...27	LTMR27CBD LTMR27CFM
100	24 ~ 100...240	5...100 5...100	LTMR100CBD LTMR100CFM
For DeviceNet			
8	24 ~ 100...240	0.4...8 0.4...8	LTMR08DBD LTMR08DFM
27	24 ~ 100...240	1.35...27 1.35...27	LTMR27DBD LTMR27DFM
100	24 ~ 100...240	5...100 5...100	LTMR100DBD LTMR100DFM
For Profibus DP			
8	24 ~ 100...240	0.4...8 0.4...8	LTMR08PBD LTMR08PFM
27	24 ~ 100...240	1.35...27 1.35...27	LTMR27PBD LTMR27PFM
100	24 ~ 100...240	5...100 5...100	LTMR100PBD LTMR100PFM
For Ethernet TCP/IP (communication protocols: Modbus/TCP and EtherNet/IP)			
8	24 ~ 100...240	0.4...8 0.4...8	LTMR08EBD LTMR08EFM
27	24 ~ 100...240	1.35...27 1.35...27	LTMR27EBD LTMR27EFM
100	24 ~ 100...240	5...100 5...100	LTMR100EBD LTMR100EFM
Filter			
Control voltage	Current max	Reference	
V	mA		
~ 150...240	130	LTM9F	



# TeSys

## TeSys T Motor management system

### Product references



LTMEV40BD



LTMCC004



LTMCUF

#### Extension modules (with voltage measurement on the 3 phases)

Input control voltage	Number of inputs	Supply to the electronics	Reference
⎓ 24	4	Via the controller	<b>LTMEV40BD</b>
~ 100...240	4	Via the controller	<b>LTMEV40FM</b>

#### HMI terminals

Description	Supply Voltage	Reference
Operator control unit	Languages: English French Spanish Supply via the controller	<b>LTMCU</b>
Operator control unit with Fast Device Replacement Service (FDR)	Languages: English French Spanish Supply via the controller	<b>LTMCUF</b>
Kit for portable LTM CU		<b>LTM9KCU</b>
Magelis compact display.	⎓ 24 V external	<b>XBTN410</b>

Description	Number and type of connectors	Length m	Reference
Connecting cables for the LTM CU control unit	2 x RJ45	1	<b>LTM9CU10</b>
		3	<b>LTM9CU30</b>
Connecting cables for the XBT N410	SUB-D 25-way female RJ45	2.5	<b>XBTZ938</b>

#### Cables

Description	Number and type of connectors	Length m	Reference
Connecting cables	2 x RJ45	0.04	<b>LTMCC004<sup>(1)</sup></b>
For connecting the controller to the extension module		0.3	<b>LTM9CEXP03</b>
		1	<b>LTM9CEXP10</b>

#### Replacement connectors

Description	Number and type of connectors	Reference
Complete set of connectors for controllers and extension modules	10 screw terminals (all network versions included)	<b>LTM9TCS</b>
Connector extraction tool		<b>LTM9TCT<sup>(2)</sup></b>

<sup>(1)</sup> Sold in lots of 6.

<sup>(2)</sup> Sold in packs of 3.

Motor  
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# TeSys

## TeSys T Motor management system

### Product references

Motor  
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LT6CT4001



DA1TT000

#### Configuration tools

Description	Composition	Reference	Weight kg
Connection cable for PC	USB to RJ45 cable, lenght 2.5 m	TCSMCNAM3M002P	0.200

#### Current transformers <sup>(1)</sup>

Operational current		Reference	Weight kg
Primary A	Secondary A		
100	1 <sup>(2)</sup>	LT6CT1001	0.550
200	1 <sup>(2)</sup>	LT6CT2001	0.550
400	1 <sup>(2)</sup>	LT6CT4001	0.550
800	1 <sup>(2)</sup>	LT6CT8001	0.680

#### Earth fault toroids (marketed under the Schneider Electric brand)

Rated operational current I <sub>e</sub> A	Internal Ø of toroid mm	Reference	Weight kg
Closed toroids, type A			
65	30	50437	0.120
85	50	50438	0.200
160	80	50439	0.420
250	120	50440	0.530
400	200	50441	1.320
630	300	50442	2.230

#### Split toroids, type OA

85	46	50485	1.300
250	110	50486	3.200

#### PTC thermistor probes <sup>(3)</sup>

Description	Nominal Operating Temperature (NOT) °C	Colour	Unit reference <sup>(4)</sup>
Triple probes	90	Green/green	DA1TT090
	110	Brown/brown	DA1TT110
	120	Grey/grey	DA1TT120
	130	Blue/blue	DA1TT130
	140	White/blue	DA1TT140
	150	Black/black	DA1TT150
	160	Blue/red	DA1TT160
	170	White/green	DA1TT170

<sup>(1)</sup> The transformers offered for use with TeSys U starters are suitable.

Please consult our "TeSys U starter-controllers" catalogue.

<sup>(2)</sup> For use with LTMR0800 controllers.

<sup>(3)</sup> PTC: Positive Temperature Coefficient.

<sup>(4)</sup> Sold in lots of 10.



### Marking accessories (to be ordered separately)

Description	Composition	Height mm	Unit reference	Weight kg
Clip-in markers	Strips of 10 identical numbers (0 to 9) or capital letters (A to Z)	5	NSYTRABF5● <sup>(1)</sup>	0.002
		6	NSYTRABF6● <sup>(1)</sup>	0.002

### Connection accessories

Description	Length m	Reference	Weight kg
<b>For Modbus connection</b>			
Cables fitted with 2 x RJ45 connectors	0.3	VW3A8306R03	0.045
	1	VW3A8306R10	0.065
	3	VW3A8306R30	0.125
T-junctions	0.3	VW3A8306TF03	0.032
	1	VW3A8306TF10	0.032
RS 485 line terminator	—	VW3A8306R	0.012

### For CANopen connection

Cables		50	TSXCANCA50	4.930
		100	TSXCANCA100	8.800
		300	TSXCANCA300	24.560
IP20 connectors	Elbowed (90°)	—	TSXCANKCDF90T	0.046
SUB-D 9-way female	Straight	—	TSXCANKCDF180T	0.049
Line end adapter switch	Elbowed (90°) with SUB-D 9-way connector for connection to PC or diagnostic tool	—	TSXCANKCDF90TP	0.051

### For DeviceNet connection

Cables	50	TSXCANCA50	4.930
	100	TSXCANCA100	8.800
	300	TSXCANCA300	24.560

### For Profibus DP connection <sup>(2)</sup>

Cables				
		100	TSXPBSCA100	—
		400	TSXPBSCA400	—
Connectors	With line terminator	—	490NAD91103	—
	Without line terminator	—	490NAD91104	—
	With line terminator and terminal port	—	490NAD91105	—

### For Ethernet TCP/IP connection

#### Shielded twisted pair cables to standard EIA/TIA568

Cables fitted with 2 x RJ45 connectors for connection to terminal equipment	Straight	2	490NTW00002	—
		5	490NTW00005	—
		12	490NTW00012	—
		40	490NTW00040	—
		80	490NTW00080	—

#### Shielded twisted pair cables, UL and CSA 22.1 approved

Cables fitted with 2 x RJ45 connectors for connection to terminal equipment	Straight	2	490NTW00002U	—
		5	490NTW00005U	—
		12	490NTW00012U	—
		40	490NTW00040U	—
		80	490NTW00080U	—
Ethernet Connector	Elbowed 180°	—	LTM9CE180T <sup>(3)</sup>	0.180

<sup>(1)</sup> When ordering, replace the ● in the reference with the number or letter required.

<sup>(2)</sup> To order other connectors and cables (UL cables for harsh environments, etc.), please consult our Customer Care Centre.

<sup>(3)</sup> Sold in packs of 6.





#### 0.37 to 355 kW at 400/415 V: type 2 coordination

##### With switch-disconnector, contactor and class 10 controller

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 400/415 V		Switch-disconnector	aM fuses		Contactor	TeSys T controller	External current transformer
P	I <sub>e</sub>	Reference <sup>(1)</sup>	Size	Rating	Reference <sup>(2)</sup>	Reference	Reference
kW	A			A			
0.37	1.1	GS1DD	10 x 38	2	LC1D09	LTMR08●●	—
0.55	1.5	GS1DD	10 x 38	2	LC1D09	LTMR08●●	—
0.75	1.9	GS1DD	10 x 38	4	LC1D09	LTMR08●●	—
1.1	2.7	GS1DD	10 x 38	4	LC1D09	LTMR08●●	—
1.5	3.6	GS1DD	10 x 38	4	LC1D09	LTMR08●●	—
2.2	4.9	GS1DD	10 x 38	6	LC1D09	LTMR08●●	—
3	6.5	GS1DD	10 x 38	8	LC1D09	LTMR27●●	—
4	8.5	GS1DD	10 x 38	10	LC1D09	LTMR27●●	—
5.5	11.5	GS1DD	10 x 38	16	LC1D12	LTMR27●●	—
7.5	15.5	GS1DD	10 x 38	16	LC1D25	LTMR27●●	—
10	19	GS●F	14 x 51	25	LC1D25	LTMR27●●	—
11	22	GS●F	14 x 51	25	LC1D25	LTMR27●●	—
15	29	GS●F	14 x 51	32	LC1D32	LTMR100●●	—
18.5	35	GS●F	14 x 51	40	LC1D40A	LTMR100●●	—
22	41	GS●J	22 x 58	50	LC1D50A	LTMR100●●	—
30	55	GS●J	22 x 58	80	LC1D65A	LTMR100●●	—
37	66	GS●J	22 x 58	100	LC1D80	LTMR100●●	—
45	80	GS●J	22 x 58	100	LC1D95	LTMR100●●	—
55	97	GS●K	T00	125	LC1D115	LTMR08●●	LT6CT2001
75	132	GS●L	T0	160	LC1D150	LTMR08●●	LT6CT2001
90	160	GS●N	T1	200	LC1F185	LTMR08●●	LT6CT2001
110	195	GS●N	T1	250	LC1F225	LTMR08●●	LT6CT4001
132	230	GS●QQ	T2	315	LC1F265	LTMR08●●	LT6CT4001
160	280	GS●QQ	T2	355	LC1F400	LTMR08●●	LT6CT4001
200	350	GS2S	T3	500	LC1F400	LTMR08●●	LT6CT8001
250	430	GS2S	T3	500	LC1F500	LTMR08●●	LT6CT8001
315	540	GS2S	T3	630	LC1F630	LTMR08●●	LT6CT8001
355	610	GS2V	T4	800	LC1F630	LTMR08●●	LT6CT8001

(1) GS●: GS1 for direct operator, GS2 for external operator.

(2) For reversing operation, replace the prefix LC1 with LC2.



# TeSys

## TeSys T Motor management system

### Product references

#### 0.06 to 250 kW at 400/415 V: type 2 coordination

##### With Circuit breaker, contactor and class 10 controller

Standard power ratings of 3-phase motors 50/60 Hz  
in category AC-3  
400/415 V

			Circuit breaker	Contactor	TeSys T controller	External current transformer
P	I <sub>e</sub>	I <sub>cc</sub>	Reference	Reference	Reference	Reference
kW	A	kA				
0.06	0.2	130	GV2L03	LC1D09	LTMR08●●	—
0.09	0.3	130	GV2L03	LC1D09	LTMR08●●	—
0.12	0.44	130	GV2L04	LC1D09	LTMR08●●	—
0.18	0.6	130	GV2L04	LC1D09	LTMR08●●	—
0.25	0.85	130	GV2L05	LC1D09	LTMR08●●	—
0.37	1.1	130	GV2L05	LC1D09	LTMR08●●	—
0.55	1.5	130	GV2L06	LC1D09	LTMR08●●	—
0.75	1.9	130	GV2L07	LC1D09	LTMR08●●	—
1.1	2.7	130	GV2L07	LC1D18	LTMR08●●	—
1.5	3.6	130	GV2L08	LC1D18	LTMR08●●	—
2.2	4.9	130	GV2L10	LC1D18	LTMR08●●	—
3	6.5	130	GV2L14	LC1D18	LTMR08●●	—
4	8.5	130	GV2L14	LC1D18	LTMR27●●	—
5.5	11.5	130	GV2L16	LC1D25	LTMR27●●	—
7.5	15.5	50	GV2L20	LC1D25	LTMR27●●	—
9	18.1	50	GV2L22	LC1D25	LTMR27●●	—
11	22	50	GV2L22	LC1D25	LTMR27●●	—
15	29	50	GV3L32	LC1D40A	LTMR100●●	—
18.5	35	50	GV3L40	LC1D50A	LTMR100●●	—
22	41	50	GV3L50	LC1D50A	LTMR100●●	—
30	55	50	GV3L65	LC1D65A	LTMR100●●	—
37	66	70	GV4LE80S	LC1D80	LTMR100●●	—
45	80	70	NSX100HMA	LC1D115	LTMR100●●	—

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# TeSys

## TeSys T Motor management system

### Product references

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#### 0.06 to 250 kW at 400/415 V: type 2 coordination

##### With circuit breaker, contactor and class 10 controller

Standard power ratings of 3-phase motors 50/60 Hz in category AC-3 400/415 V			Circuit breaker	Contactor	TeSys T controller	External current transformer
P	I <sub>e</sub>	I <sub>cc</sub>	Reference	Reference	Reference	Reference
kW	A	kA				
55	97	50	NSX160NMA	LC1D115	LTMR08●●	LT6CT2001
55	97	70	NSX160HMA	LC1D115	LTMR08●●	LT6CT2001
75	132	50	NSX160NMA	LC1D150	LTMR08●●	LT6CT2001
75	132	70	NSX160HMA	LC1D150	LTMR08●●	LT6CT2001
90	160	50	NSX250NMA	LC1F185	LTMR08●●	LT6CT2001
90	160	70	NSX250HMA	LC1F185	LTMR08●●	LT6CT2001
110	195	50	NSX250NMA	LC1F225	LTMR08●●	LT6CT2001
110	195	70	NSX250HMA	LC1F225	LTMR08●●	LT6CT2001
132	230	70	NSX400HMA	LC1F265	LTMR08●●	LT6CT4001
132	230	130	NSX400LMA	LC1F265	LTMR08●●	LT6CT4001
160	280	70	NSX400HMA	LC1F330	LTMR08●●	LT6CT4001
160	280	130	NSX400LMA	LC1F330	LTMR08●●	LT6CT4001
200	350	70	NSX630HMA	LC1F400	LTMR08●●	LT6CT4001
200	350	130	NSX630LMA	LC1F400	LTMR08●●	LT6CT4001
220	388	70	NSX630HMA	LC1F500	LTMR08●●	LT6CT4001
220	388	130	NSX630LMA	LC1F500	LTMR08●●	LT6CT4001
250	430	70	NSX630HMA	LC1F500	LTMR08●●	LT6CT8001
250	430	130	NSX630LMA	LC1F500	LTMR08●●	LT6CT8001

#### Substitution table

Motor current	Old range LT6P multifunction protection relay			New range TeSys T controllers		
	Reference	Reference	External current transformer Reference	Reference	Reference	External current transformer Reference
	~ 100...240 V	~ 24 V		~ 100...240 V	~ 24 V	
I < 5 A	LT6P0M005FM	LT6P0M005S144	–	LTMR08●FM	LTMR08●BD	–
5 A < I < 25 A	LT6P0M025FM	LT6P0M025S144	–	LTMR27●FM	LTMR27●BD	–
25 A < I < 100 A	LT6P0M005FM	LT6P0M005S144	LT6CT1001	LTMR100●FM	LTMR100●BD	–
100 A < I < 200 A	LT6P0M005FM	LT6P0M005S144	LT6CT2001	LTMR08●FM	LTMR08●BD	LT6CT2001
200 A < I < 400 A	LT6P0M005FM	LT6P0M005S144	LT6CT4001	LTMR08●FM	LTMR08●BD	LT6CT4001
400 A < I < 800 A	LT6P0M005FM	LT6P0M005S144	LT6CT8001	LTMR08●FM	LTMR08●BD	LT6CT8001



# TeSys

## TeSys T Motor management system

### Product references

0.37 to 400 kW at 690 V: type 2 coordination							
With switch-disconnector, contactor and class 10 controller							
Standard power ratings of 3-phase motors 50/60 Hz in category AC-3		Switch-disconnector <sup>(1)</sup>	aM fuses		Contactor	TeSys T controller	External current transformer
P	I <sub>e</sub>	Reference	Size	Rating	Reference	Reference	Reference
kW	A			A			
0.37	0.64	GS●F	14 x 51	1	LC1D09	LTMR08●●	–
0.55	0.87	GS●F	14 x 51	2	LC1D09	LTMR08●●	–
0.75	1.1	GS●F	14 x 51	2	LC1D09	LTMR08●●	–
1.1	1.6	GS●F	14 x 51	2	LC1D09	LTMR08●●	–
1.5	2.1	GS●F	14 x 51	4	LC1D09	LTMR08●●	–
2.2	2.8	GS●F	14 x 51	4	LC1D09	LTMR08●●	–
3	3.8	GS●F	14 x 51	6	LC1D09	LTMR08●●	–
4	4.9	GS●F	14 x 51	6	LC1D09	LTMR08●●	–
5.5	6.7	GS●F	14 x 51	8	LC1D25	LTMR08●●	–
7.5	8.9	GS●F	14 x 51	10	LC1D25	LTMR27●●	–
11	12.8	GS●F	14 x 51	16	LC1D25	LTMR27●●	–
15	17	GS●G	T000	20	LC1D32	LTMR27●●	–
18.5	21	GS●G	T000	25	LC1D32	LTMR27●●	–
22	24	GS●G	T000	32	LC1D40A	LTMR27●●	–
30	32	GS●G	T000	40	LC1D50A	LTMR100●●	–
37	39	GS●J	22 x 58	50	LC1D65A	LTMR100●●	–
45	47	GS●J	22 x 58	63	LC1D80	LTMR100●●	–
55	57	GS●J	22 x 58	80	LC1D115	LTMR100●●	–
75	77	GS●KK	T00	100	LC1D115	LTMR100●●	–
90	93	GS●KK	T00	125	LC1F150	LTMR08●●	LT6CT2001
110	113	GS●KK	T00	125	LC1F185	LTMR08●●	LT6CT2001
132	134	GS●L	T0	160	LC1F265	LTMR08●●	LT6CT2001
160	162	GS●N	T1	200	LC1F265	LTMR08●●	LT6CT2001
200	203	GS●N	T1	250	LC1F330	LTMR08●●	LT6CT4001
220	224	GS●QQ	T2	250	LC1F400	LTMR08●●	LT6CT4001
250	250	GS●QQ	T2	315	LC1F400	LTMR08●●	LT6CT4001
290	292	GS●QQ	T2	355	LC1F500	LTMR08●●	LT6CT4001
315	313	GS●QQ	T2	355	LC1F500	LTMR08●●	LT6CT4001
355	354	GS2S	T3	400	LC1F630	LTMR08●●	LT6CT4001
400	400	GS2S	T3	500	LC1F630	LTMR08●●	LT6CT8001

<sup>(1)</sup> GS●: GS1 for direct operator, GS2 for external operator.

Characteristics:  
pages C1/20 to C1/34

Curves:  
page C1/35

Dimensions, mounting:  
pages C1/36 to C1/37

Schemes:  
pages C1/38 to C1/41

Life Is On

**Schneider**  
Electric

C1/11

Motor  
management  
devices









## Technical Data for Designers

### Contents

#### TeSys U:

- > characteristics ..... C1/14 to C1/17
- > dimensions ..... C1/18
- > schemes ..... C1/19

#### TeSys T:

- > characteristics ..... C1/20 to C1/34
- > curves ..... C1/35
- > dimensions ..... C1/36 to C1/37
- > schemes ..... C1/38 to C1/41



# TeSys

## TeSys U Motor management controller

### Characteristics

PB121446 eps

Motor management devices



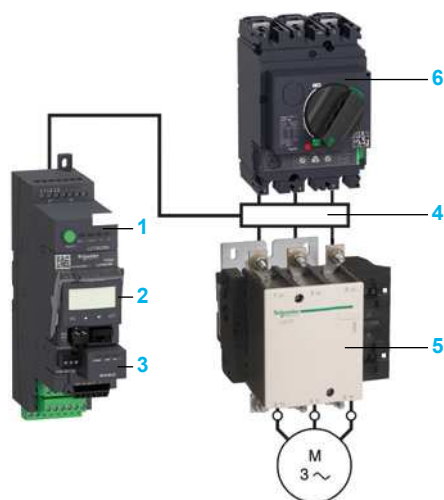
PB121450 eps



Ref.



PB121437 eps



### Introduction

Above 32 A, the TeSys U controller provides a motor starter management solution identical to that provided by TeSys U starter-controllers.

Used in conjunction with a short-circuit protection device and a contactor, it provides a motor starter whose functions are the same as those of a TeSys U starter-controller and, in particular, provides the following functions: overload protection, motor starter control and application monitoring.

It consists of a control unit whose adjustment range is compatible with the secondary of current transformers, plus a control base which also allows fitment of a function module or a communication module.

It requires a  $\sim$  24 V external power supply.

The secondaries of current transformers, the  $\sim$  24 V power supply, the 10 inputs and the 5 outputs are connected by screw terminal block.

### Application example

Detecting blockage of a rock crusher by monitoring the motor current.

#### Operating conditions

- Power: 90 kW at 400 V.
- In: 185 A.
- Duty class S1.
- Control circuit voltage:  $\sim$  230 V
- Control-command by PLC and serial link using the Modbus protocol.

#### Products used

Description	Item	Quantity	Reference	Page
Controller	1	1	LUTM20BL	C1/2 C1/3
Multifunction control unit	2	1	LUCMT1BL	A4/12
Modbus communication module	3	1	LULC033	A4/27 to A4/31
Current transformer	4	3	LUTC4001	C1/2 C1/3
Contactor	5	1	LC1F185P7	—
Circuit breaker	6	1	GV5P150F	—

#### Functions performed

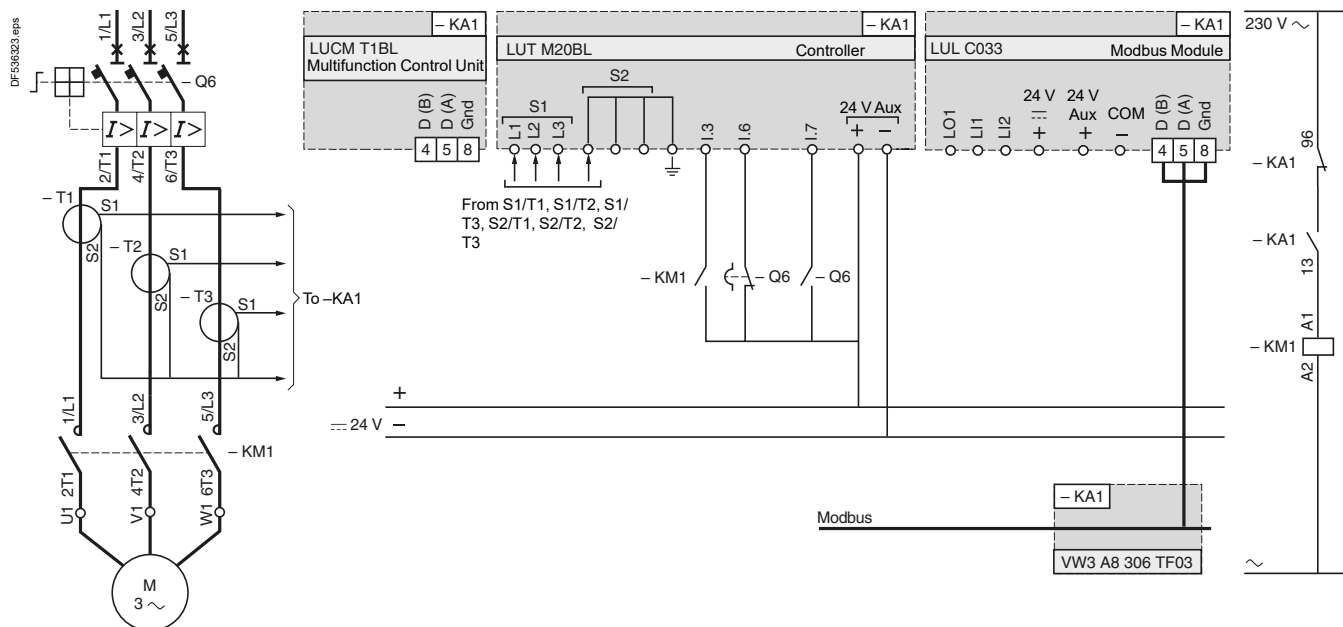
- Short-circuit protection with level of protection of 70 kA at 400V.
- Electronic protection against thermal overloads with an adjustment range of 4.
- Detection of crusher blockage by monitoring the induced overcurrent. To use the "overtorque or jam" function, the following parameters must be entered:
  - ☐ trip: the answer yes/no enables or disables the function,
  - ☐ time before tripping: the time period during which the value of the current must be above the tripping threshold in order to cause tripping (adjustable from 1 to 30 s).
  - ☐ tripping threshold: value as a % of the load current ratio in relation to the setting current. If the ratio remains above this threshold for the time specified in the previous parameter, the product trips (adjustable from 100 to 800 %).

It is possible to set the parameter for an alarm at a preset threshold under the same conditions as above.



## Application example

## Scheme



Motor  
management  
devices

## Other functions

The multifunction control unit incorporates other control and protection functions, such as: monitoring and control of phase current, alarm, ... Communication module LUL C033 also provides a programmable output and two programmable inputs.



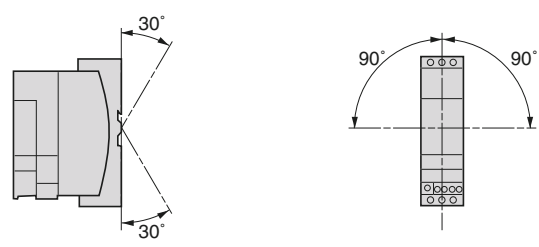
# TeSys

## TeSys U Motor management controller

### Characteristics

Motor  
management  
devices

Ref.  
  


Environment				
Control base and control unit type		LUTM + LUCBT1BL or LUCDT1BL without LULC		LUTM + LUCMT1BL or LULC
Product certifications			UL, CSA, ASEFA	
Conforming to standards			IEC/EN 60947-4-1, UL 508, CSA C22-2 N°14	
Rated insulation voltage of the outputs (Ui)	Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution: 3	V	250	
	Conforming to UL508, CSA C22-2 n°14	V	250	
Rated impulse withstand voltage of the outputs (Uimp)	Conforming to IEC/EN 60947-4-1	kV	4	
Degree of protection Conforming to IEC/EN 60947-1 (protection against direct finger contact)	Front panel (outside connection zone)		IP 40	
	Front panel and wired terminals		IP 20	
	Other faces		IP 20	
Protective treatment	Conforming to IEC/EN 60068-2-30	Cycles	12	
	Conforming to IEC/EN 60068-2-11	h	48	
Ambient air temperature around the device	Storage	°C	- 40...+ 85	
	Operation	°C	- 25...+ 70	- 25...+ 60
Maximum operating altitude		m	2000	
Operating positions Without derating	In relation to normal vertical mounting plane			
Flame resistance	Conforming to UL 94		V2	
	Conforming to IEC/EN 60695-2-12	°C	960 (parts supporting live components)	
		°C	650	
Shock resistance 1/2 sine wave = 11 ms	Conforming to IEC/EN60068-2-27 <sup>(1)</sup>		15 gn	
Vibration resistance 5...300 Hz	Conforming to IEC/EN 60068-2-6 <sup>(1)</sup>		4 gn	
Resistance to electrostatic discharge	Conforming to IEC/EN 61000-4-2	kV	In open air: 8 - Level 3	
		kV	On contact: 6 - Level 3	
Resistance to radiated fields	Conforming to IEC/EN 61000-4-3	V/m	10 - Level 3	
Immunity to fast transient currents	Conforming to IEC/EN 61000-4-4	kV	CT outputs and inputs: 4 - Level 4	
		kV	Inputs and supply: 2 - Level 3	
Immunity to radioelectric fields	Conforming to IEC/EN 61000-4-6	V	10	
Control base and control unit relays				
Immunity to dissipated shock waves	Conforming to IEC/EN 60947-4-1		Common mode	Serial mode
	Output relays / power line	kV	4	2
	Inputs	kV	2	1
	Serial communication	kV	2	—

<sup>(1)</sup> Without modifying the contact states, in the most unfavourable direction.



# TeSys

## TeSys U Motor management controller

### Characteristics

Control circuit supply characteristics			
Operational voltage		<b>V</b>	~ 20.4...28.8
Power consumption		<b>W</b>	2 max
Associated protection		<b>A</b>	gG fuse, 0.5
Cabling			
Connectors	Pitch	<b>mm</b>	5
Flexible cable without cable end	1 conductor	<b>mm<sup>2</sup></b>	0.2...2.5
	2 identical conductors	<b>mm<sup>2</sup></b>	0.2...1.5
Flexible cable with cable end			
Without insulated ferrule	1 conductor	<b>mm<sup>2</sup></b>	0.25...2.5
	2 identical conductors	<b>mm<sup>2</sup></b>	0.25...1
With insulated ferrule	1 conductor	<b>mm<sup>2</sup></b>	0.25...2.5
	2 identical conductors <sup>(1)</sup>	<b>mm<sup>2</sup></b>	0.5...1.5
Solid cable without cable end	1 conductor	<b>mm<sup>2</sup></b>	0.2...2.5
	2 identical conductors	<b>mm<sup>2</sup></b>	0.2...1
Conductor size	1 conductor		AWG24 to AWG12
Tightening torque		<b>N.m</b>	0.5...0.6
Flat screwdriver		<b>mm</b>	3

Input characteristics		
Operational voltage		<b>V</b> ~ 24
Logic inputs		Logic state 1: $I \geq 6 \text{ mA}$ - 16 V Logic state 0: $I \leq 1.5 \text{ mA}$ - 5 V

Discrete output characteristics				
Base controller type		LUTM10BL		LUTM20BL
Type		Single break volt-free contacts		
Load	a.c. supply		C 300	B 300
	d.c. supply		24 V/5 A	24 V/5 A
Permissible power in cat. AC-15	For 500 000 operating cycles	<b>VA</b>	180	500
Permissible power in cat. DC-13	For 500 000 operating cycles	<b>W</b>	30	30
Associated protection		<b>A</b>	gG fuse, 4	gG fuse, 4
Used with contactor type <sup>(2)</sup>			Control voltage ~ 24 V: LP1K, LC1D09...D95.  Control voltage ~ 24...240 V: LC1K, LC1D.	Control voltage ~ 100...240 V: LC1K, LC1D, LC1F185...F500

Characteristics of external current transformers LUTC...1							
Precision			Class 5P				
Precision limit factor			10				
Maximum operating temperature		<b>°C</b>	70				
Transformer ratio			30/1	50/1	100/1	200/1	400/1
Diameter of conductor passage hole		<b>mm</b>	28	22	35	32	—
Maximum wire c.s.a.		<b>mm<sup>2</sup></b>	30 x 10	30 x 10	40 x 10	65 x 32	38 x 127

<sup>(1)</sup> Use a double cable end.

<sup>(2)</sup> For other combinations, use an intermediate relay between the output of controller LUTM and the contactor coil.



TeSys
TeSys U Motor management controller
Dimensions, mounting

Dimensions, mounting

Controllers

LUTM●0BL

Rail mounting

Rail mounting

Motor management devices

DF567124.eps

DF567125.eps

a
With Modbus module
135
With Advantys STB, CANopen or DeviceNet modules
147

(1) Depth with communication module.

Current transformers

LUTC0301...1001

LUTC2001...8001

DF567127.eps

DF567128R.eps

LUTC	a	b	b1	c	Ø	G	J
0301	77	107	42.5	46	28	45	54
0501	56	84	31	42	23	45	50
1001	77	107	42.5	46	35	45	54

LUTC	a	a1	b	b1	c	G	J
2001	90	32	94	55	40	62	62
4001	99	38	160	127	40	75	65
8001	125	54	160	127	40	100	65

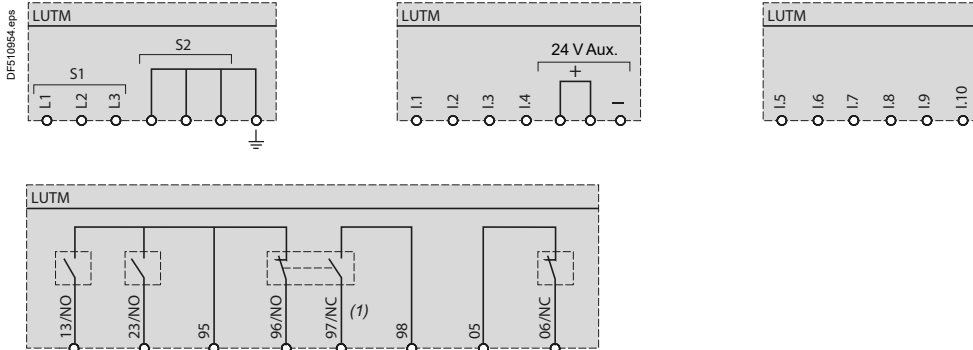
Characteristics:
pages C1/14 to C1/17
References:
pages C1/2 and C1/3
Schemes:
page C1/19

C1/18
Life Is On
Schneider Electric

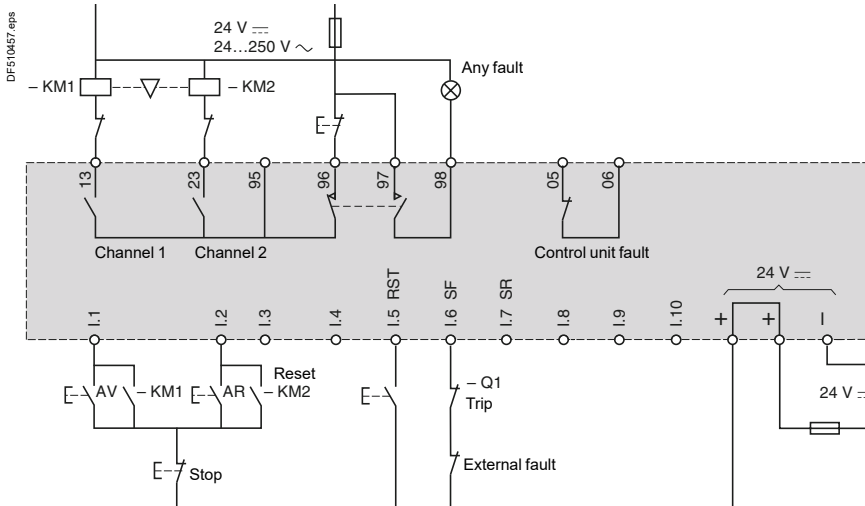


## Schemes

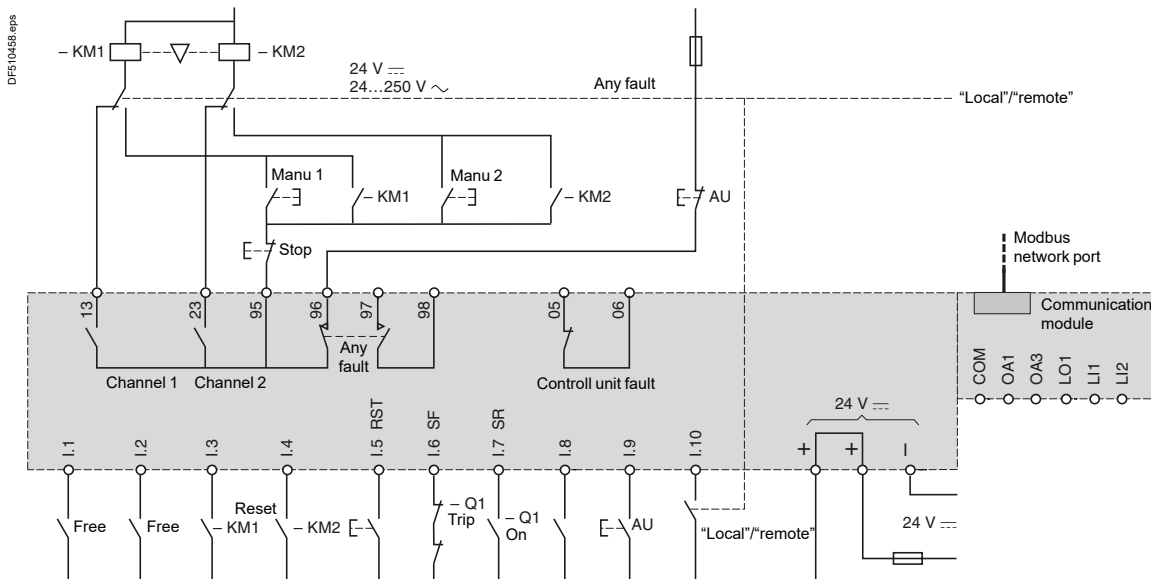
### Reversing controller LUTM



### 3-wire control, pulsed start with maintaining contact



### Control for Modbus communication module LULC033



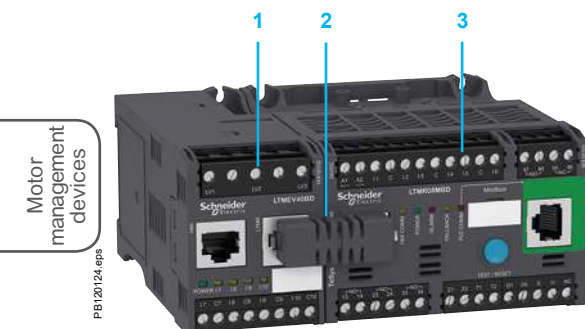
(1) The contacts are represented with controller powered up and not in a fault condition.



# TeSys

## TeSys T Motor management system

### Characteristics



- 1 LTMEV40BD extension module
- 2 LTMCC004 2 x RJ45 jumper
- 3 LTMR08MBD controller

### Introduction

TeSys T is a motor management system that provides protection, metering and monitoring functions for single-phase and 3-phase, constant speed, a.c. motors up to 810 A.

Suitable for the harshest applications, this product range offers:

- high-performance multifunction protection, independent of the automation system
- a local HMI control unit for reading, displaying and modifying the parameters monitored, diagnostics, etc.
- configuration using SoMove software
- connection to the automation system via a communication network (selection according to various protocols).

### Application

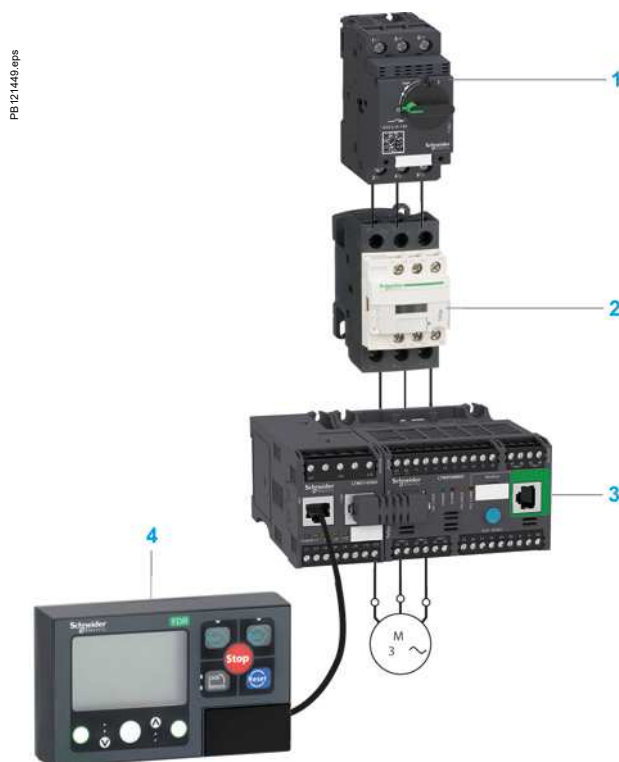
The TeSys T motor management system is used for motor control and protection in harsh industrial applications, in which downtime must be avoided because it is very costly: Oil & Gas, chemical industry, water treatment, metal, minerals and mining, pharmaceutical industry, microelectronics, tunnels, airports etc.

With TeSys T, unexpected stops of a process or manufacturing, associated with a motor, are anticipated via predictive analysis of fault situations. Fault tripping is therefore reduced to a minimum.

Its use in motor control panels makes it possible to:

- increase the operational availability of installations
- improve flexibility from project design through to implementation
- increase productivity by making available all information needed to run the system.

The TeSys motor management system integrates perfectly with Schneider Electric low voltage equipment, such as Okken, Blokset and Prisma.



- 1 Magnetic Circuit breaker
- 2 Contactor
- 3 Controller with extension module
- 4 Operator control unit



# TeSys

## TeSys T Motor management system

### Characteristics



LTM08MBD



LTMEV40BD



LTMCUF

#### Introduction

##### Composition of the motor management system

The system comprises:

- an LTMR motor management controller
  - with internal current transformer up to 100 A
  - above 100 A, by external current transformer up to 810 A
- an LTME extension module
- an LTMCU operator control unit
- configuration software incorporated in the SoMove software application
- accessories for system set-up.

##### Communication

The LTMR controller is equipped with a communication interface to allow remote monitoring and control of the motor. All motor information is then available at automation system level.

The following networks are available:

- Modbus, CANopen, DeviceNet, ProfiBus DP and Ethernet TCP/IP (with two communication protocols, Modbus/TCP and EtherNet/IP).

#### TeSys T system functions

##### Protection functions

- against thermal overload
- against phase imbalance and phase failure
- thermal motor protection via PTC probes
- against phase reversal
- against earth faults
- against long starting times and motor stalling
- against automatic load shedding and restarting
- against load fluctuations (I, U, P)
- against variations of Cos  $\varphi$  (power factor).

##### Metering functions

- Measurements (rms values):
  - current on the 3 phases
  - voltage on the 3 phases (shedding)
  - motor temperature
  - earth fault.
- Values calculated:
  - average current
  - frequency
  - Cos  $\varphi$  (power factor), power, power consumption...

##### Motor control functions

A motor managed by TeSys T can be controlled:

- locally, using the logic inputs present on the product, or via the HMI terminal
- remotely, via the network (connection by terminal block or connector except for DeviceNet: terminal block only).

##### Motor control modes

5 predefined motor control modes are incorporated in the controller:

- overload mode: monitoring of motors whose control is not managed by the controller,
- independent mode: starting of non-reversing motors,
- reverser mode: starting of reversing motors,
- 2-step mode: 2-step starting of motors (star-delta, by autotransformer and by resistor),
- 2-speed mode: 2-speed starting of motors (Dahlander, pole changer).

A 6<sup>th</sup> "Custom" mode is available to allow the user to create a specific motor control mode that is not predefined in the controller.

##### Statistical and diagnostic functions

- Fault statistics: counters per type of protection and history of the last 5 faults.
- Motor statistics: saving of motor statistics values.
- Diagnosis of faults affecting correct operation of the product.



# TeSys

## TeSys T Motor management system

### Characteristics

Motor  
management  
devices



LTMR●●

Ref.



#### The LTMR controller

The controller is the central component in the motor management system. It manages the basic functions such as:

- measurement of 3-phase current via integral current transformers from 0.4 to 100 A (up to 810 A by external current transformers)
- measurement of earth current by external earth fault toroid
- measurement of motor temperature by PTC probe
- inputs and outputs for the various motor control modes, fault management and associated functions.

#### Characteristics

##### Supply

2 types of controller power supply are available:

- 24 V $\overline{\text{DC}}$
- 100...240 V $\sim$ .

##### Current ranges

3 current ranges allow measurement of motor current from 0.4 to 100 A:

- 0.4...8 A
- 1.35...27 A
- 5...100 A.

For use with external current transformers, choose the 0.4...8 A range (1 or 5 A current transformer secondary).

##### Inputs

- 6 discrete logic inputs.

##### Outputs

- 3 relay logic outputs (1N/O).
- 1 relay output for fault signalling (1N/O + 1N/C).

##### Measurements

- Connections for a temperature probe.
- Connections for an earth fault toroid.

#### LTME extension module

The extension module adds the following functionalities to the TeSys T controller:

- voltage measurement on the 3 phases. This enables it to calculate numerous engine monitoring parameters (power, frequency, Cos  $\phi$ ...)
- 4 additional inputs.

#### Characteristics

##### Inputs

- 4 discrete logic inputs (independent).

##### Power supplies

- 2 types of power supply for the inputs: 24 V $\overline{\text{DC}}$  and 100...240 V $\sim$ .
- A 24 V $\overline{\text{DC}}$  expansion module can be assembled with a 24 V $\overline{\text{DC}}$  controller or with a 100...240 V $\sim$  controller.
- A 100...240 V $\sim$  expansion module can be assembled with a 100...240 V $\sim$  controller.

**Voltage measurement between phases up to 690 V nominal.**



# TeSys

## TeSys T Motor management system

### Characteristics



LTMCU

#### Human/Machine Interfaces (HMI)

Depending on the application, 2 types of HMI can be used with the LTMR controller.

- The LTMCU operator control unit:
  - entirely dedicated to the TeSys T range
  - only for control/monitoring of an LTMR controller.
- A Magelis XBTN410 terminal for control/monitoring of 1 to 8 LTMR controllers.

#### LTMCU operator control unit

Dedicated exclusively to TeSys T controllers, control unit LTMCU makes it possible to:

- configure the parameters of the LTMR controller
- display information on controller configuration and operation
- monitor the alarms and faults generated by the controller
- local control of the motor via the local control interface (keys can be customised). Three different languages can be loaded into the LTMCU controller at the same time.

By default, these 3 languages are:

- LTMCU: English, French and Spanish

**Note:** English is the only compulsory language.

A language download utility (LangTool), together with all the other languages, are available on the website "www.se.com".

This tool allows the languages present in the LTMCU control unit to be adapted.

The LTMCU HMI control unit has an RJ45 port, protected by a flexible cover to provide a good level of protection (IP54).

This port on the front panel allows connection to a PC, via a connecting cable, in order to use SoMove software.

In this case, the control unit acts as a transmitter and all information can then be viewed in SoMove.

The LTMCU HMI can be used as a portable version by using the separate kit LTM9KCU. This kit consists of two snap-on plastic shells (tool-free mounting) fitted with a simple fixing system that uses magnets for mounting on all types of metal surfaces.

#### The Magelis XBT N410 HMI terminal

Two applications have been predefined for TeSys T. Depending on the application loaded, the HMI terminal makes it possible to:

- configure and monitor a motor starter (LTM\_1T1\_V1.dop)
- monitor and modify certain parameters on up to 8 motor starters (LTM\_1T8\_X\_V1.dop) <sup>(1)</sup>.

XBTL1000 programming software is needed for loading applications into the HMI terminal.

These applications are available on the website "www.se.com".

**(1)** Replace the X with an E for the English version, or an F for the French version.



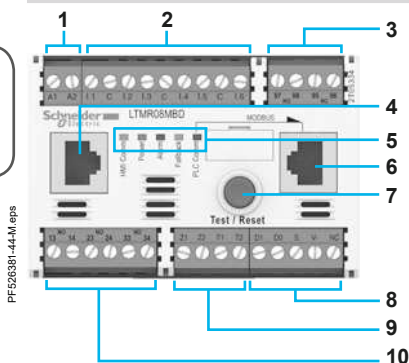
# TeSys

## TeSys T Motor management system

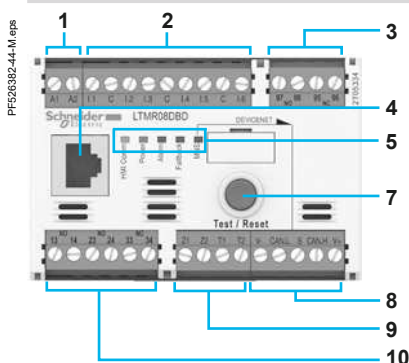
### Characteristics

#### LTMR controllers

##### Modbus



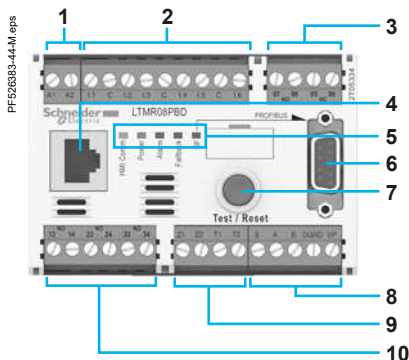
##### DeviceNet



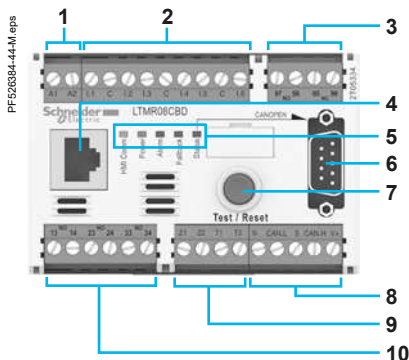
Controllers feature the following on their front panel:

- 1 Controller power supply.
- 2 Input connections.
- 3 Fault outputs (N/O+N/C).
- 4 Port for connection to the HMI terminal, a PC or an extension module (RJ45).
- 5 Controller status LEDs.
- 6 Network port for connection to the network by connector (except DeviceNet) <sup>(1)</sup>.
- 7 Test/Reset button.
- 8 Connection to the network by terminal block (except Ethernet TCP/IP).
- 9 Connection for an earth fault toroid and temperature probes.
- 10 Outputs for motor control mode function.

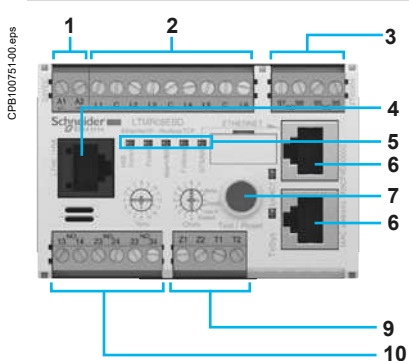
##### Profibus DP



##### CANopen

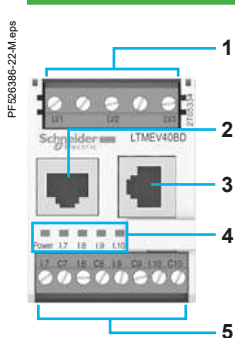


##### Ethernet TCP/IP (communication protocols: Modbus/TCP and EtherNet/IP)



<sup>(1)</sup> Connection using power extension (daisy-chaining) is possible for Ethernet TCP/IP.

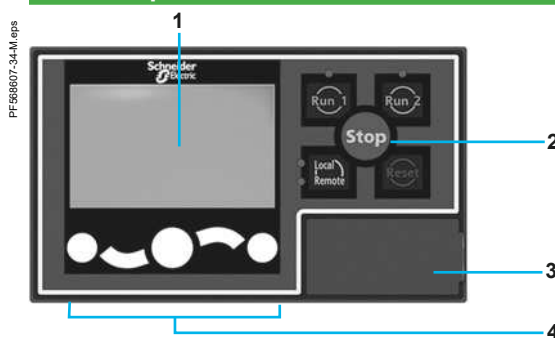
#### LTMEV40 extension modules



Extension modules have the following on their front face:

- 1 Inputs for voltage measurement.
- 2 Port for connection to the HMI terminal or to the PC.
- 3 Port for connection to the controller.
- 4 Extension module status LEDs.
- 5 Connection of additional inputs.

#### LTMCU operator control unit



The control unit has the following on its front face:

- 1 Screen LCD display.
- 2 Local control interface including control keys and LEDs.
- 3 RJ45 port on front panel for connection to a PC (protected by a cover).
- 4 Contextual navigation keys.



# TeSys

## TeSys T Motor management system

### Characteristics

Thermal and current protection functions					
Functions	Setting range	Controller LTMR	Controller and extension module (LTMR + LTME)	Alarm threshold	Fault threshold
Description					
Thermal overload: thermal protection of motor by monitoring current consumption	Class: 5, 10, 15, 20, 25, 30. Inverse ther/definite time				
Motor temperature: thermal monitoring of the motor using temperature probes (winding, paper...). Up to 3 sensors in series.	PTC binary PTC/NTC analogue: 20 ...6500 Ohm				
Phase imbalance: monitors the symmetry of currents. To be used for imbalance < 80 % of the average current <sup>(1)</sup> .	10...70% I average 0.2...20 s				
Phase failure: monitors the symmetry of currents. To be used for imbalance < 80 % of the average current <sup>(1)</sup> .	0.1...30 s				
Phase reversal: signals when the phase sequence is different from the defined sequence (motor running).	A-B-C A-C-B				
Long starting time: monitors the motor starting time	100...800 % of FLC <sup>(2)</sup> 1...200 s				
Locked rotor: locking detected by a sudden increase in current after the start phase	100...800 % of FLC <sup>(2)</sup> 1...30 s				
Min/max current load limit variations: monitors motor load through variations of current around preset thresholds.	min.: 30...100 % of FLC <sup>(2)</sup> 1...200 s max.: 20...800 % of FLC <sup>(2)</sup> 1...250 s				
Earth fault: signals internal insulation faults, by vectorial summing of external currents, via earth fault toroid.	internal: 50...500 % min FLC <sup>(2)</sup> 0.5...25 s external: 0.02...21 A 0.1...25 s				
Frequent starting: Protects the motor against overheating due to frequent starting.	0...999.9 s				
Voltage and power protection functions					
Phase imbalance: monitors the symmetry of voltage between phases. To be used for imbalance < 40 % of the average voltage <sup>(3)</sup> .	3...15 % 0.2...20 s				
Phase failure: monitors the symmetry of voltage between phases. To be used for imbalance > 40 % of the average voltage <sup>(3)</sup> .	0.1...30 s				
Phase reversal: signals when the phase sequence is different from the defined sequence (motor stopped).	A-B-C A-C-B				
Voltage variations. Min/max voltage limits: monitors voltage variations around preset thresholds.	min.: 70...99 % 0.2...25 s max.: 101...115 % 0.2...25 s				
Load shedding: opens outputs O.1 and O.2 if voltage drops below a preset threshold.	68...115 % 1...9999 s				
Power variations. Min/max power limits: monitors power variations around preset thresholds.	20...800 % 1...100 s				
Variations of Cos φ. Min/max limits of Cos φ: monitors variations of Cos φ around preset thresholds.	0...1 s 1...25 s				

Function performed.

<sup>(1)</sup> Average current value measured on the 3 phases.

<sup>(2)</sup> FLC: Full Load Current (setting current).

<sup>(3)</sup> Average voltage value measured on the 3 phases.



# TeSys

## TeSys T Motor management system

### Characteristics

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Motor control functions				
Functions	Description		With controller LTMR	With controller LTMR and extension module LTME
Control modes	Local, via terminal block		■	■
	Local, via HMI terminal <sup>(1)</sup>		■	■
	Remote, via network		■	■
Operating modes	Overload		■	■
	Independent		■	■
	Reverser		■	■
	2-step		■	■
	2-speed		■	■
	"Custom" mode		■	■
Fault management	Manual reset		■	■
	Automatic reset		■	■
	Remote reset		■	■
Metering functions and statistics				
Functions	Description	Measurement range	With controller LTMR	With controller LTMR and extension module LTME
Measurements <sup>(2)</sup>	Current/Phase	0.08...1000 A	■	■
	Earth current	0.1633 x CT ratio	■	■
	Average current	0.08...1000 A	■	■
	Current imbalance between phases	0...200 %	■	■
	Thermal capacity level	0...200 %	■	■
	Motor temperature rise	0...6500 Ohm	■	■
	Frequency	0...100 Hz		■
	Voltage between phases	~0...830 V		■
	Voltage imbalance between phases	0...200 %		■
	Active power	0...6553.5 kW		■
	Reactive power	0...6553.5 kWr		■
	Cos φ (power factor)	0...100		■
	Active power consumption	0...400 kWh		■
	Reactive power consumption	0...400 kWrh		■
Fault statistics	Protection fault counters		■	■
	Protection alarm counters		■	■
	Diagnostic fault counters		■	■
	Motor control function counters		■	■
	Fault history		■	■
Fault diagnostics	Internal watchdog fault		■	■
	Controller internal temperature		■	■
	Temperature sensor connection		■	■
	Current connection		■	■
	Voltage connection		■	■
	Motor control commands (start, stop, run check back and stop check back)		■	■
	Control configuration checksum		■	■
Motor statistics	Loss of communication		■	■
	Number of motor control commands (0.1/0.2 starts)		■	■
	Operating time		■	■
	Number of starts/hour		■	■
	Last start I max.		■	■
Thermal overload statistics	Duration of last start		■	■
	Time to trip		■	■
	Time to restart		■	■
System operating statistics	Run, ON, Start, alarm, fault.		■	■

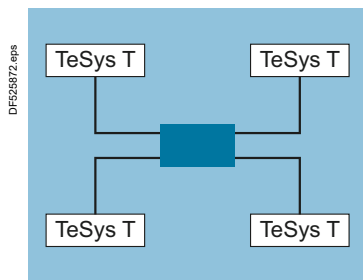
<sup>(1)</sup> HMI: Human Machine Interface.  
<sup>(2)</sup> See measurement details page C1/32.



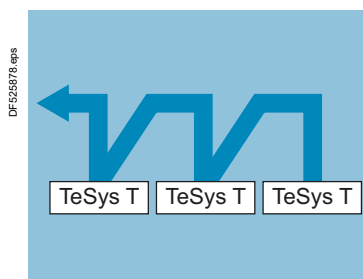
# TeSys

## TeSys T Motor management system

### Characteristics



Star topology



Daisy chain topology

#### Star topology

In a star topology, all the peripherals are linked via an intermediate peripheral (hub or switch).

In industrial Ethernet applications, the use of full duplex switches (instead of hubs) as central peripherals is strongly recommended.

#### Daisy chain topology

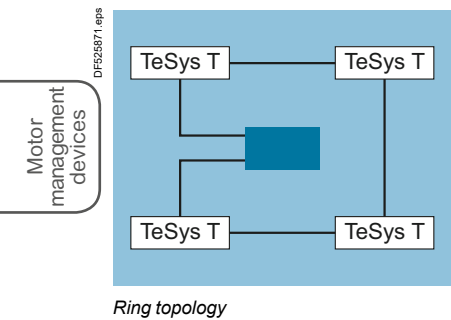
Daisy chaining, at bus level, is another connection topology commonly used in industrial automation system networks. The cable segments link several peripherals to each other, constituting the peripheral "section" of the network cable.

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## Ethernet: different network topologies

### Ring topology

In a ring topology, all the peripherals or components of the network infrastructure are connected within a loop. This type of topology makes it possible to achieve different levels of redundancy of the network.

### Ethernet ring

Ethernet rings are generally the main networks in applications where a high level of reliability is required. If a ring topology is required, the switches handling this function must be used.

### Redundancy

Redundancy of the network infrastructure is the key to development of applications with high operational reliability. Implementing a single or double ring architecture makes it possible to provide protection against breaks in network segments.

### Single ring

The first level of redundancy can be achieved by installing a single ring. ConneXium switches can be used to establish main network ring configurations. The ring is created using RSTP protocol. If a section of the line fails, the ring structure converts into a line type configuration.

## Ethernet: different communication protocols

LTMR controllers communicating over an Ethernet network can communicate either using the Modbus/TCP communication protocol or using the EtherNet/IP communication protocol. Both protocols are loaded in the controller. One must be selected for the operation.

**Note:** EtherNet/IP communication protocol is supported by ODVA, also promoter of DeviceNet communication solution. Note that in EtherNet/IP, IP stands for Industrial Protocol.

■ IP address Class for Ethernet TCP/IP version: Class A 20.ETH10/100.

Services available on Ethernet TCP/IP version		
	In Modbus/TCP	In Ethernet/IP
Web Server	■	■
Modbus messaging	■	
IO Messaging		■
Explicit Messaging		■
Client FDR	■	■
SNMP network administrator	■	■
RSTP	■	■
Discovery	■	■
Master IP	■	■
Broadcast Storm Protection	■	■

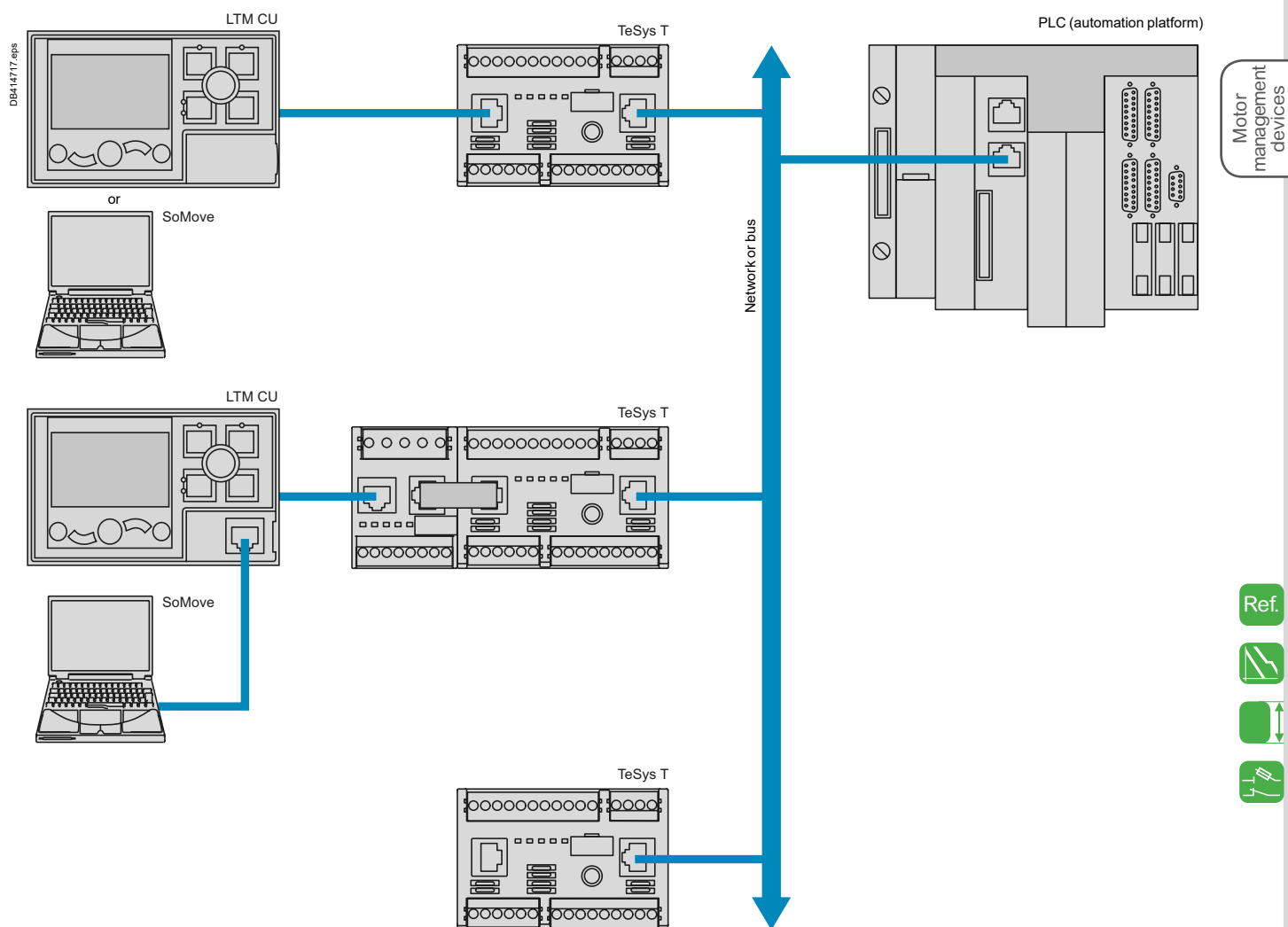


# TeSys

## TeSys T Motor management system

### Characteristics

#### Possible configurations and applications

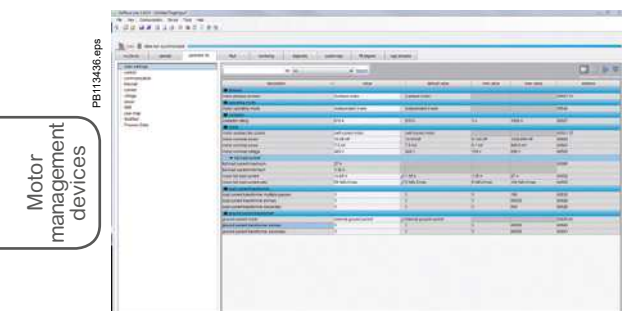




# TeSys

## TeSys T Motor management system

### Characteristics



Example of TeSys T configurator setup screen

### Configuration with SoMove

The TeSys T configurator is incorporated in the SoMove software application, as from version 2.5. <sup>(1)</sup>

It allows configuration, commissioning and maintenance of motor starters protected by TeSys T.

A library containing predefined motor control mode functions is available in order to:

- allow standardisation
- avoid errors
- reduce motor starter setup times.

5 predefined motor control modes are incorporated in the controller:

- overload mode: monitoring of motors whose control is not managed by the controller
- independent mode: starting of non-reversing motors
- reverser mode: starting of reversing motors
- 2-step mode: 2-step starting of motors (star-delta, by autotransformer and by resistor)
- 2-speed mode: 2-speed starting of motors (Dahlander, pole changer).

By using logic functions, a "Custom" mode makes it possible to:

- easily adapt these predefined motor control mode functions to the specific needs of your applications
- create a link with the motor starter environment or
- create new functions.

The functions thus defined can be saved and used to build your function library for future applications.

To create special functions, a logic editor is incorporated in the configurator and allows a choice of 2 programming languages:

- function block
- structured text.

<sup>(1)</sup> An update file is available, free of charge, on the website "www.se.com".

It will enable you to take advantage of the latest functions in the TeSys T motor management system.

Ref.

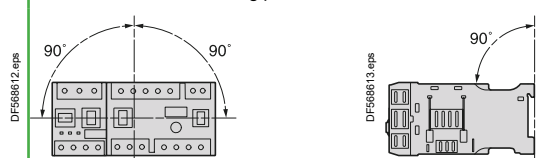




# TeSys

## TeSys T Motor management system

### Characteristics

Environment						
Product type			LTMR controllers		LTMEV40 extension modules	
Conforming to standards			IEC/EN 60947-4-1, UL60947-4-1A, CSA 22-2 n°60947-4-1, IACS E10			
Product certifications			UL, CSA, CE, CCC, EAC/GOST, RCM/CTIC'K, Atex, Marine (BV, LROS, DNV, RINA, ABS) <sup>(1)</sup>			
Rated insulation voltage of the outputs (Ui)	Conforming to IEC/EN 60947-1, overvoltage category III, degree of pollution 3	V	690			
	Conforming to UL 508, CSA C222 n° 14	V	690			
Rated impulse withstand voltage (Uimp)	Conforming to IEC/EN 60947-4-1					
	~ 100...240 V supply, inputs and outputs	kV	4	4		
	--- 24 V supply, inputs and outputs	kV	0.8	0.8		
	Communication circuits	kV	0.8	—		
	Current or voltage measurement circuit	kV	6	6		
Short-circuit withstand	Conforming to IEC/EN 60947-4-1	kA	100			
Climatic withstand	Conforming to IEC/EN 60068-2-30		12 x 24 hour cycles			
	Conforming to IEC/EN 60070-2-11	h	48			
Ambient air temperature around the device	Storage	°C	- 40...+80			
	Operation	°C	- 20...+60			
Operating position without dating	In relation to normal vertical mounting plane		±30° in relation to mounting plate, ±90° 			
Flame resistance	Conforming to UL 94	°C	960 (for parts supporting live components)			
	Conforming to IEC/EN 60695-2-12	°C	650 (for other parts)			
Shock resistance (1/2 sine wave, 11 ms)	Conforming to IEC/EN 60068-2-27 <sup>(2)</sup>		15 gn			
Vibration resistance	Conforming to IEC/EN 60068-2-6 <sup>(2)</sup> 5...300 Hz		4 gn (plate mounted) 1 gn (mounted on L rail)			
Resistance to electrostatic discharge	Conforming to IEC/EN 61000-4-2	kV	In open air: 8 - Level 3 On contact: 6 - Level 3			
Immunity to radiated electromagnetic interference	Conforming to IEC 61000-4-3	V/m	10 - Level 3			
Immunity to fast transient bursts	Conforming to IEC 61000-4-4	kV	On supply and relay outputs: 4 - Level 4 Other circuits: 2 - Level 3			
Immunity to radioelectric fields <sup>(3)</sup>	Conforming to IEC/EN 61000-4-6	V	10 - Level 3			
Immunity to dissipated shock waves	Conforming to IEC/EN 61000-4-5		Common mode	Serial mode	Common mode	Serial mode
	Relay outputs and supply	kV	4	2	—	—
	--- 24 V inputs	kV	1	1	1	1
	~ 100...240 V inputs	kV	2	1	2	1
	Voltage inputs	kV	—	—	4	2
	Communication	kV	2	—	2	—
	Temperature sensor (IT1/IT2)	kV	1	0.5	—	—
Altitude derating			2000 m	3000 m	3500 m	4000 m
	Rated operational voltage (Ui)		1	0.93	0.87	0.8
	Max. operating temperature		1	0.93	0.92	0.9
					4500 m	0.88

(1) Certain certifications are pending; please consult your Customer Care Centre.

(2) Without modifying the contact states, in the most unfavorable direction.

(3) This product has been designed for use in environment A and in B, it may cause unwanted electromagnetic disturbance to other devices, which may require the implementation of adequate mitigation measures.



# TeSys

## TeSys T Motor management system

### Characteristics

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Controller and extension module characteristics							
Product type			Controllers		Extension modules		
			LTMR●●●BD	LTMR●●●FM	LTMEV40BD	LTMEV40FM	
Control supply							
Operational voltage (U)	Conforming to IEC/EN 60947-1	V	≡ 24	~ 100...240	—		
Resistance to voltage dips	Conforming to IEC/EN 61000-4-11	V	0 for 3 ms 70 % of U for 500 ms		—		
Associated protection		A	gG fuse, 0.5		—		
Operational voltage	Limit values	V	≡ 20.4...26.24	~ 93.5...264	—		
Current consumption	50/60 Hz	mA	≡ 56...127	~ 8...62.8	—		
Connectors	Pitch	mm	5.08		5.08		
Flexible cable without cable end	1 conductor	mm²	0.2...2.5		0.2...2.5		
	2 identical conductors	mm²	0.2...1.5		0.2...1.5		
Flexible cable with cable end	Without insulated ferrule	1 conductor	0.25...2.5		0.25...2.5		
		2 identical conductors	0.5...1.5		0.5...1.5		
	With insulated ferrule	1 conductor	0.25...2.5		0.25...2.5		
		2 identical conductors	0.2...1		0.2...1		
Solid cable without cable end	1 conductor	mm²	0.2...2.5		0.2...2.5		
	2 identical conductors	mm²	0.2...1		0.2...1		
Conductor size			AWG24 to AWG14		AWG24 to AWG14		
Tightening torque		N.m	0.5...0.6		0.5...0.6		
Flat screwdriver		mm	3		3		
Input characteristics							
Nominal values	Conforming to IEC/EN 61131-1		Type 1 positive logic (≡: resistive, ~: capacitive)				
	Voltage		V	≡ 24	~ 100...240	≡ 24	~ 100...240
	Current		mA	≡ 7	~ 3.1 for 100 V ~ 7.5 for 240 V	≡ 7	~ 3.1 for 100 V ~ 7.5 for 240 V
Logic inputs	Logic state 1	Voltage	V	15 min	79 < U < 264	15 min	79 < U < 264
		Current	mA	2 min...15 max	2 min at 110 V... 3 min at 220 V	2 min...15 max	2 min at 110 V... 3 min at 220 V
	Logic state 0	Voltage	V	5 max	0 < U < 40	5 max	0 < U < 40
		Current	mA	15 max	15 max	15 max	15 max
Response time	Change to state 1	ms	15	25	15	25	
	Change to state 0	ms	5	25	5	25	
Output characteristics							
Type			Volt free, single break				
Load	~		250 V / 5 A B300				
	≡		30 V / 5 A				
Permissible power in cat. AC-15	For 500 000 operating cycles	VA	480 / I <sub>e</sub> max: 2 A				
Permissible power in cat. DC-13	For 500 000 operating cycles	W	30 / I <sub>e</sub> max: 1.25 A				
Associated protection		A	gG fuse, 4				
Max. frequency		Hz	2				
Max. operating level		op. cycles/h	1800				
Response time	Change to state 1	ms	10 max				
	Change to state 0	ms	10 max				
Measurement details							
Current			1 % for the 0.4...8 A and 1.35...27 A ranges 2 % for the 5...100 A range				
Voltage			1 % from 100 to 830 V				
Earth fault current	Internal measurement without earth fault toroid		5...15 % for current > 0.1 A in the 0.4...8 A range current > 0.2 A in the 1.35...27 A range current > 0.3 A in the 5...100 A range				
	External measurement with earth fault toroid		< 5 % or 0.01 A				
Temperature measurement			2 %				
Power factor			10 %				
Active and reactive power			15 %				
Internal clock			±30 min / year				

References: pages C1/4 to C1/11      Curves: page C1/35      Dimensions, mounting: pages C1/36 to C1/37      Schemes: pages C1/38 to C1/41



# TeSys

## TeSys T Motor management system

### Characteristics

Bus and network characteristics						
Type of bus/network		Modbus	CANopen	DeviceNet	Profibus DP	Ethernet
Physical interface		2-wire RS 485	ISO 11898	ISO 11898	polarised 2-wire RS 485	IEEE 802.3
Addressing		1 to 247	1 to 127	1 to 64	1 to 125	0 to 159 <sup>(1)</sup>
Transmission speeds		1.2 to 19.2 kb/s	10, 20, 50, 125, 250, 500, 800 and 1000 kb/s + Auto baud	125 to 500 kb/s	9.6 kb to 12 Mb/s	10/100 Mb/s, with automatic recognition
Connections		RJ45/terminal block	9-way SUB-D/terminal block	Terminal block	9-way SUB-D/terminal block	RJ45
Cables		2 shielded twisted pairs	4 twisted, shielded wires	4 twisted, shielded wires	2 shielded twisted pairs, type A	2 shielded twisted pairs

LTMCU operator control unit			
Environment			
Conforming to standards			IEC/EN 61131-2, UL60947-4-1A, CSA 22-2 n°60947-4-1
Product certifications			UL, CSA, CE, EAC/GOST, RCM/CTIC'K
Ambient air temperature around the device	Storage	°C	-40...+80
	Operation	°C	-20...+60
Relative humidity			15...95 % without condensation
Climatic withstand	Conforming to IEC/EN 60068-2-30		12 x 24 hour cycles
Degree of protection	Conforming to IEC 60947-1		IP54
Shock resistance	Conforming to IEC/EN 60068-2-27		15 gn / 11ms
Vibration resistance	Conforming to IEC/EN 60068-2-6 5...300 Hz		4 gn
Flame resistance	Conforming to IEC 60947-1	°C	650
	Conforming to UL 94		V2

Electrical characteristics			
Supply to the product			Powered via the controller
Maximum current		mA	140
Maximum power dissipated		W	1
Resistance to electromagnetic discharge	Conforming to IEC/EN 61000-4-2	kV	In open air: 8. Level 3 On contact: 4. Level 3
Immunity to radiated electromagnetic interference	Conforming to IEC/EN 61000-4-3	V/m	10 - Level 3
Immunity to fast transient bursts	Conforming to IEC/EN 61000-4-4	kV	2, shielded access. Level 3
Immunity to radioelectric fields	Conforming to IEC/EN 61000-4-6	V	10. Level 3
Immunity to shock waves	Conforming to IEC/EN 61000-4-5	kV	2, shielded access. Level 3

Physical characteristics		
Mounting		Flush mounted
Display		Backlit LCD
Signalling		By 4 LEDs
Cabling		RJ45

(1) For DHCP, stored IP, addressing limited by subnet mask.



# TeSys

## TeSys T Motor management system

### Characteristics

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#### LT6CT●●●● external current transformer characteristics

Conforming to standards		IEC 60185, BS 7626			
Precision		Class 5P			
Precision limit factor		15			
Rated insulation voltage (Ui)		690			
Maximum operating temperature	°C	50			
Transformer ratio	A	100/1	200/1	400/1	800/1
Diameter of conductor passage hole	mm	35	35	35	35
Maximum cabling c.s.a.	mm <sup>2</sup>	30 x 10	30 x 10	30 x 10	incorporated <sup>(1)</sup>

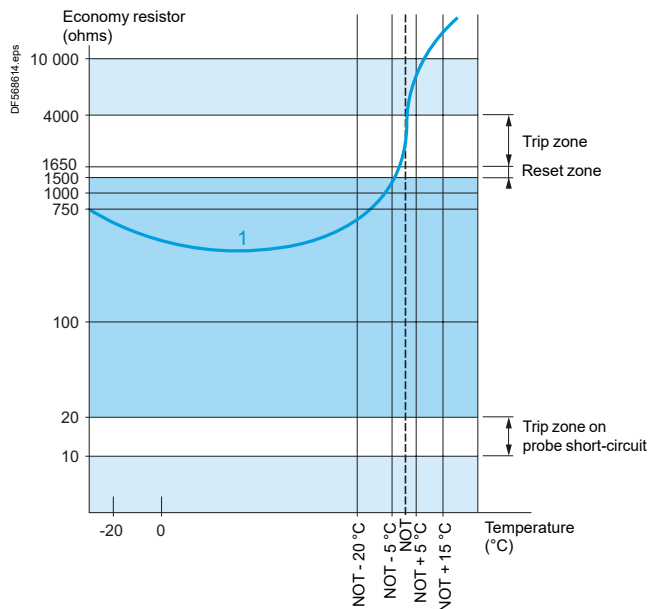
#### Earth fault toroid characteristics

Toroid type		50437	50438	50439	50440	50441	50442	50485	50486
Rated insulation voltage Ui	V	1000							
Operating temperature	°C	- 35... + 70							
Protection index		IP30 (connections IP20)							
Transformer ratio		1/1000							
Rated operational current Ie	A	65	85	160	250	400	630	85	250
Max. conductor c.s.a. per phase	mm <sup>2</sup>	25	50	95	240	2 x 185	2 x 240	50	240

#### DA1TT●● probe characteristics

Conforming to standards		IEC 60034-11 mark A	
Economy resistor	At 25 °C	Ω	3 x 250 in series
Rated operational voltage (Ue)	Per probe	V	--- 2.5 max
Rated insulation voltage (Ui)		kV	2.5
Insulation			Reinforced
Length of connecting cables	Between probes	mm	250
	Between probe and motor terminal plate	m	1

**Guaranteed operating zones:** example with 3 probes type DA1TT●●● (250 Ω at 25 °C) in series, conforming to standard EC 60034-11, mark A.



1 3 probes type DA1●●● (250 Ω at 25 °C) in series.

NOT: Nominal Operating Temperature.

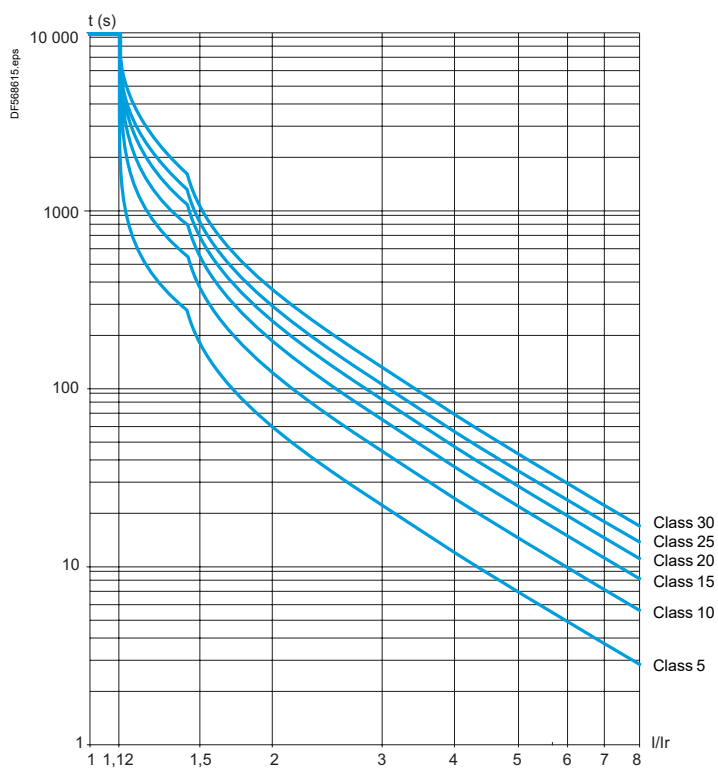
Protection unit tripped.

Protection unit reset.

<sup>(1)</sup> Electrical connection to be made using M10 bolt.



### Cold state curves

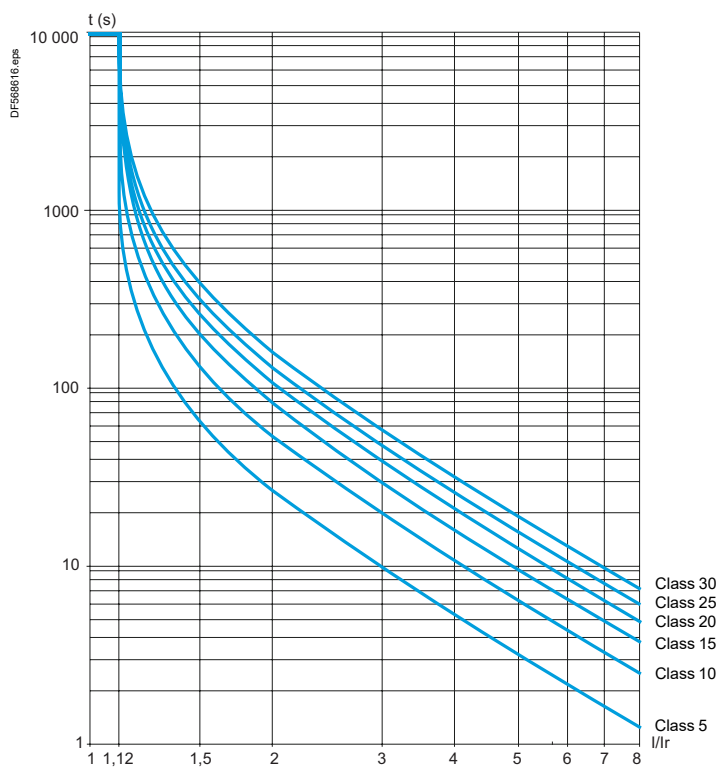


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devices

Ref.



### Hot state curves



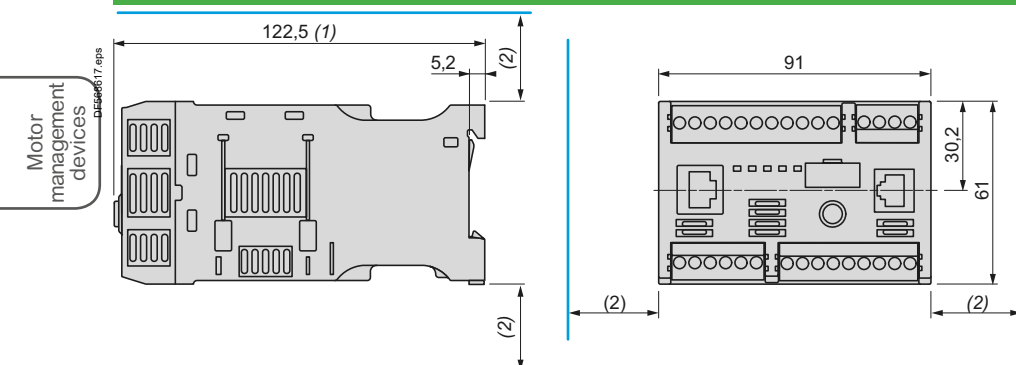


# TeSys

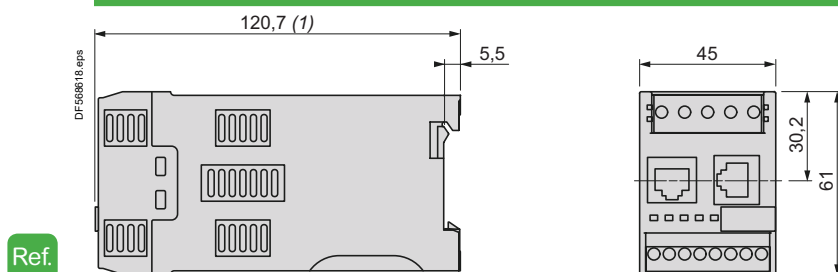
## TeSys T Motor management system

### Dimensions, mounting

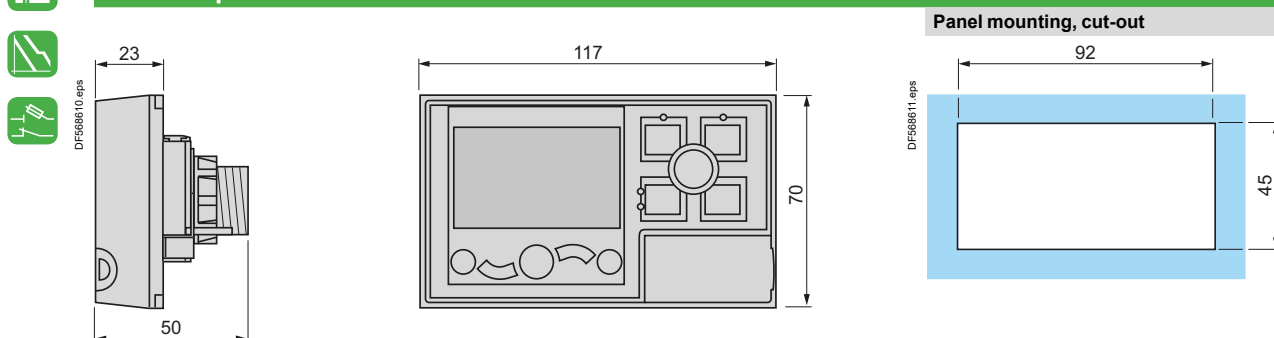
#### LTMR●● controllers



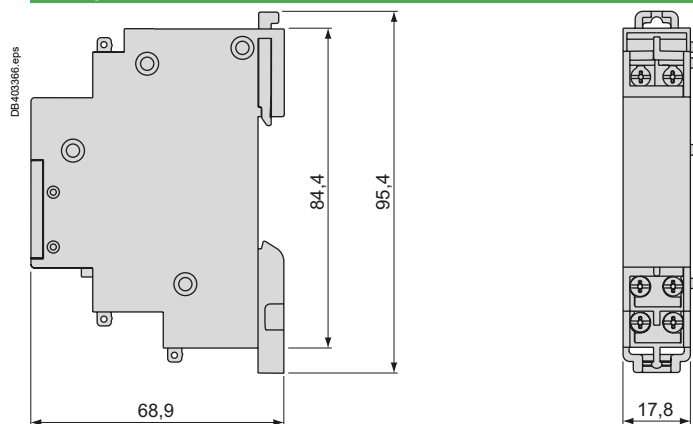
#### LTMEV40●● extension modules



#### LTMCU operator control unit



#### LTM9F



- (1) 140 mm with RJ45 connector for connection to extension module and to network,  
166 mm with Profibus DP/CANopen connector.
- (2) Leave a gap around the device of: 9 mm at 45 °C, 9 to 40 mm from 45 to 50 °C, 40 mm at 60 °C.



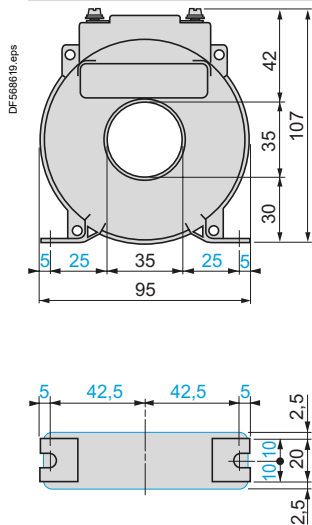
# TeSys

## TeSys T Motor management system

### Dimensions

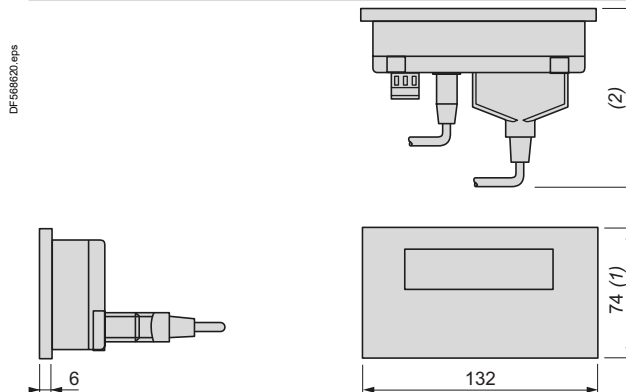
#### Current transformers

##### LT6CT



#### HMI terminal

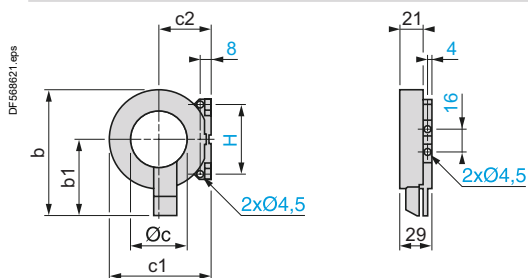
##### XBTN410



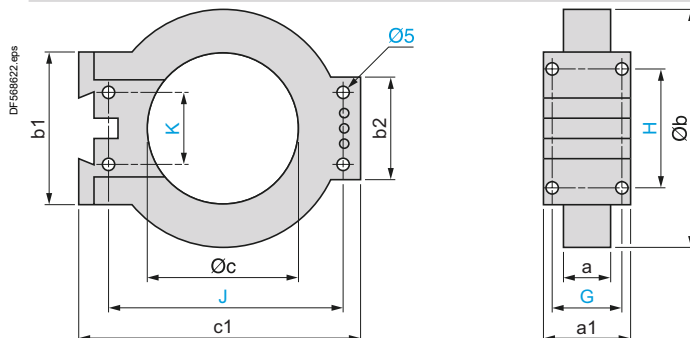
- (1) 104 mm with fixing clips (supplied with the product).  
 (2) 58 mm with SUB-D 25-way elbowed cable **XBTZ9680** for Twido, TSX Micro and Premium or **XBTZ998** for Advantys STB.  
 104 mm with SUB-D 25-way cable **XBTZ68/Z9681** for Twido, TSX Micro and Premium.

#### Earth fault toroids

##### 50437 and 50438



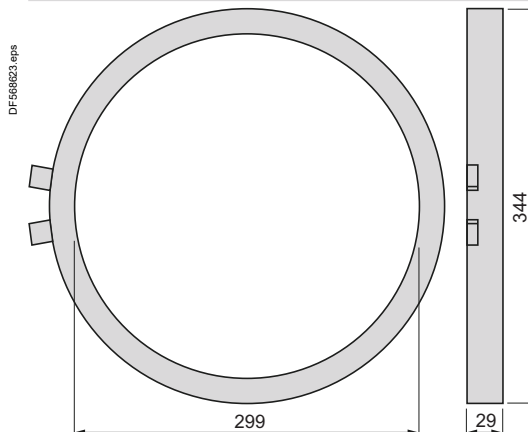
##### 50439, 50440 and 50441



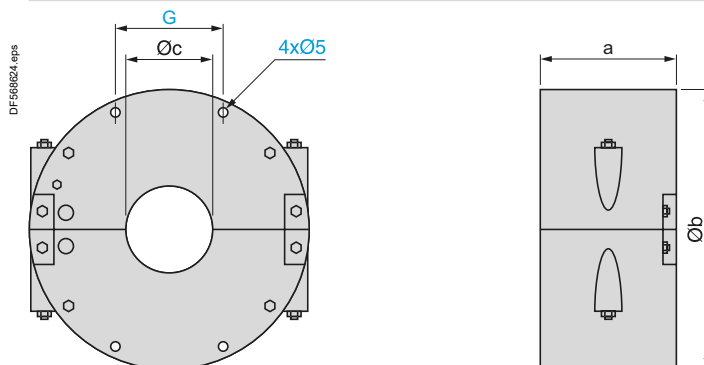
Type	b	b1	Øc	c1	c2	H
50437	83	53	30	60	31	50
50438	109	66	50	87	45	60

Type	a	a1	Øb	b1	b2	Øc	c1	G	H	J	K
50439	26.5	44	122	80	55	80	150	35	65	126	40
50440	26.5	44	164	80	55	120	190	35	65	166	40
50441	29	46	256	120	90	196	274	37	104	254	60

##### 50442



##### 50485 and 50486



Type	a	Øb	Øc	G
50485	72	148	46	57
50486	78	224	110	76

References:  
pages C1/4 to C1/11

Characteristics:  
pages C1/20 to C1/34

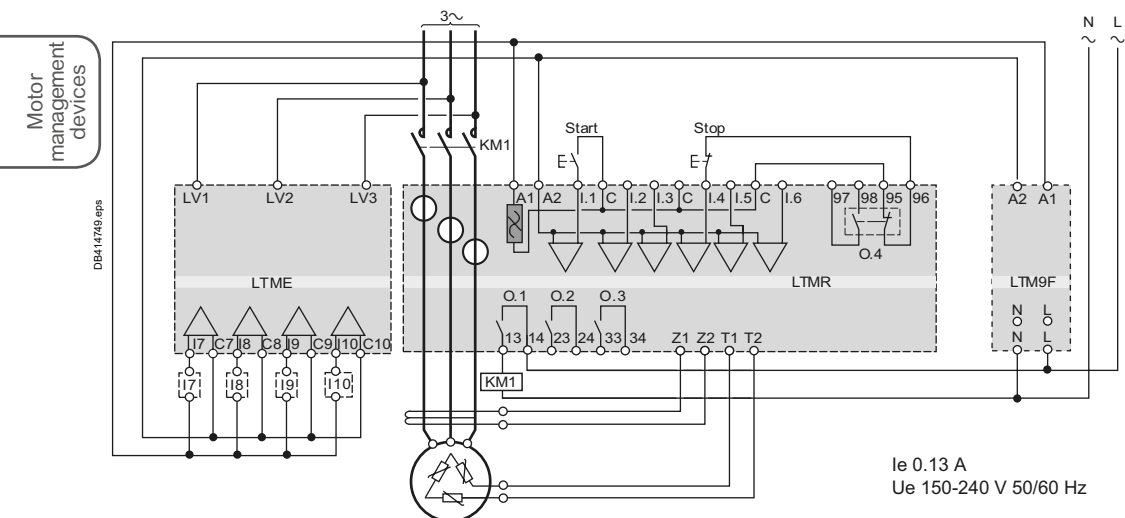
Curves:  
page C1/35

Schemes:  
pages C1/38 to C1/41



## Schemes

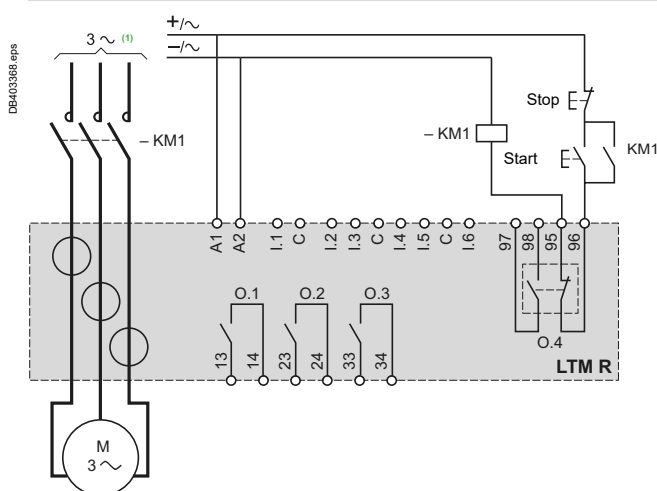
### LTMR●●FM wiring with LTM9F filter



**Note:** inputs *MUST* be connected across the common terminals (C).

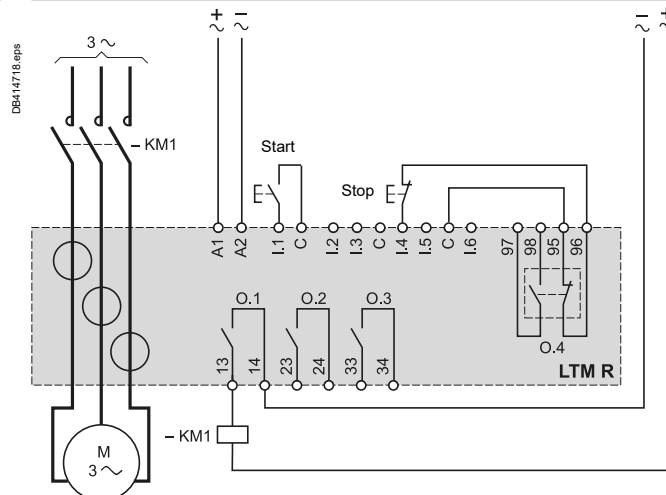
## Overload mode

### 3-wire local-control



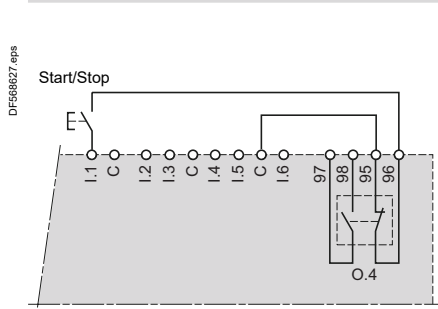
## Independent mode

### 3-wire local-control

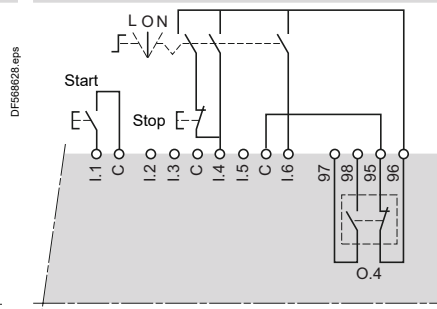


**(1)** Connection of a single-phase motor is possible. In this case, do not use the central current transformer.

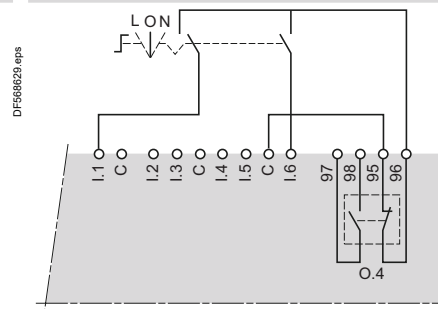
## 2-wire local-control



### 3-wire with switchable local/network control



### 2-wire with switchable local/network control



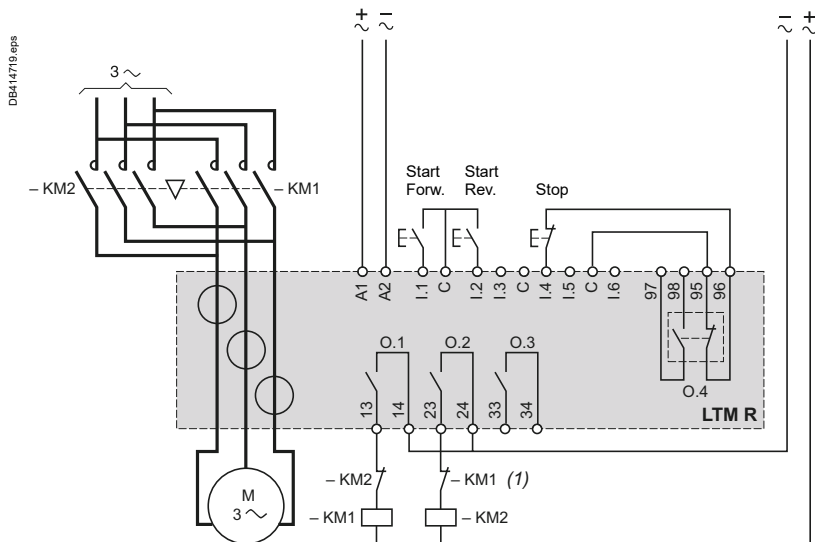
L: Local control  
O: Stop  
N: Network control



#### Schemes

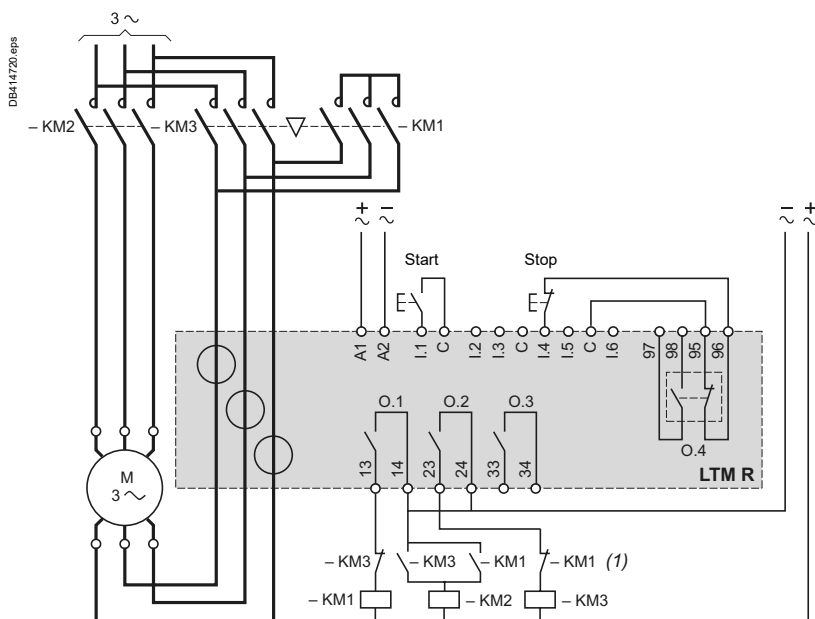
##### Reverser mode

##### 3-wire local-control



##### 2-step mode, star-delta application

##### 3-wire local-control



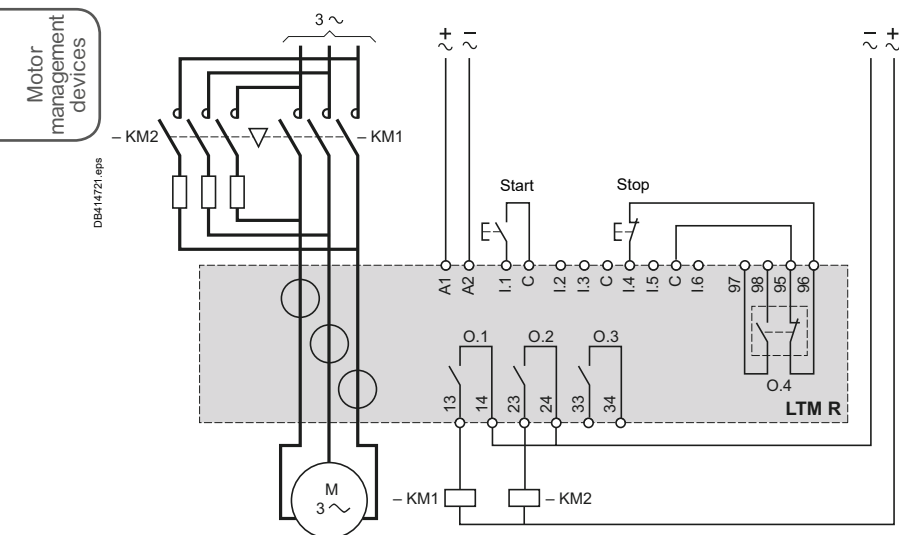
(1) Contacts for interlocking KM1 and KM2 are not obligatory because the controller electronically interlocks outputs O.1 and O.2.



#### Schemes

##### 2-step mode, primary resistor application

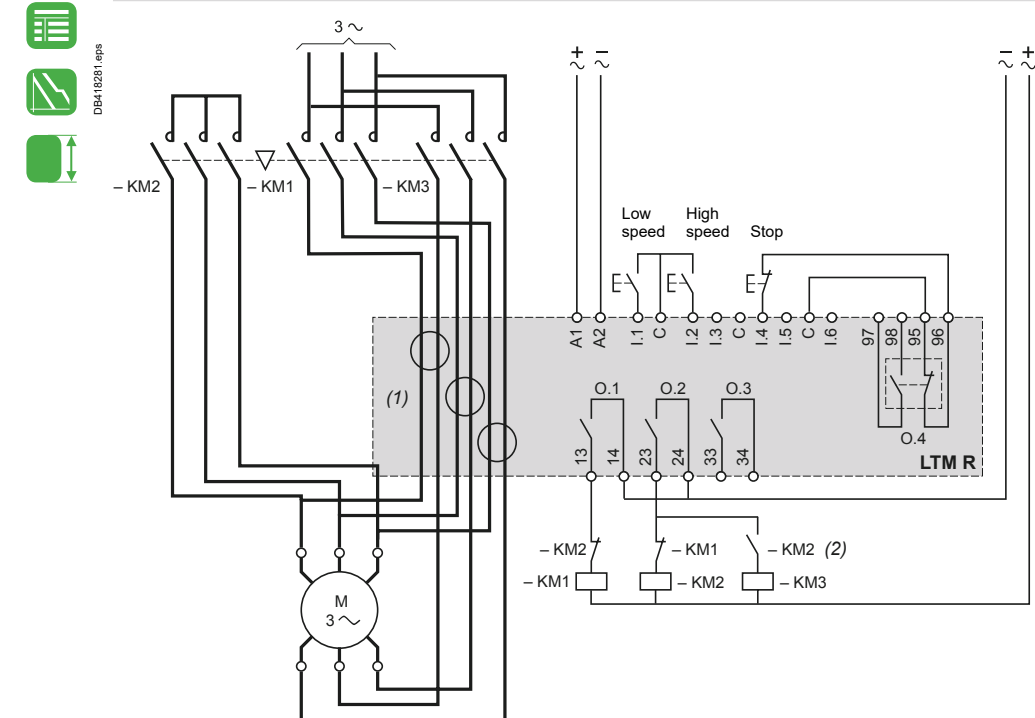
##### 3-wire local-control



#### Ref.

##### 2-speed mode, Dahlander application

##### 3-wire local-control

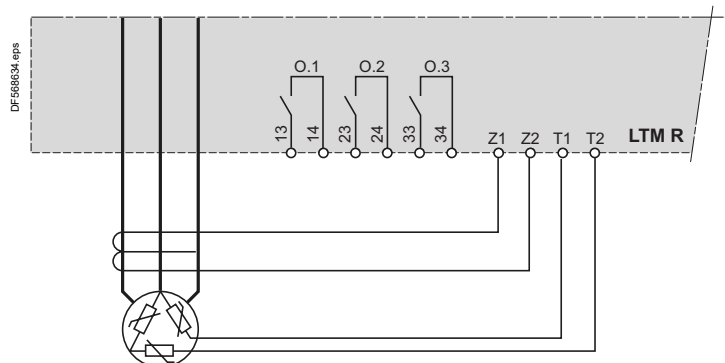


- (1) For a Dahlander application, all the power cables must pass through current transformers. The controller can also be placed upstream of the contactor. In this case, and if the Dahlander motor is used in "variable torque" mode, all the cables downstream of the contactors must be of identical size.
- (2) Contacts for interlocking KM1 and KM2 are not obligatory because the controller electronically interlocks outputs O.1 and O.2.



#### Schemes

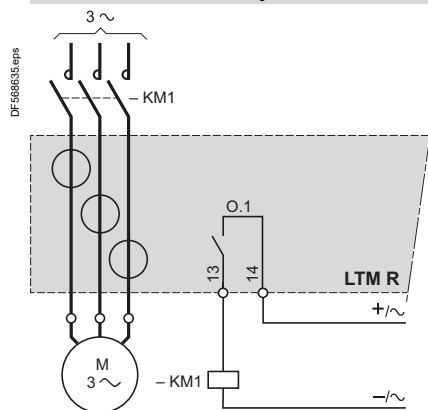
##### Earth fault toroid and motor temperature probe connection



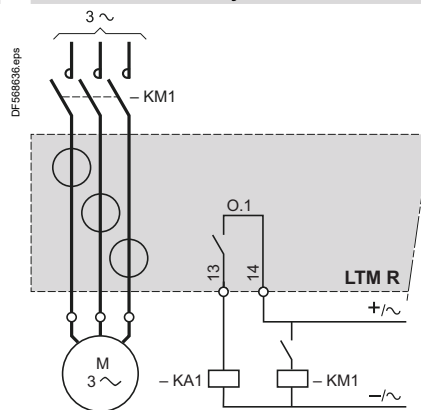
Motor  
management  
devices

##### Connection of outputs for motor control mode function

###### Without intermediate relay



###### With intermediate relay



Ref.









TeSys™ island	
Type of information	Pages
<b>Introduction</b> Digital multifunctional load management solution	 C2/2



## Digital multifunctional load management solution

**TeSys™ island** is designed to switch, protect, and manage motors and other electrical loads up to 80 Amps (AC3) in an electrical control panel.



### Dedicated to Control and Monitor Machine and Processes

**TeSys™ island** is a digital load management solution that makes machines and processes smarter and more reliable.

**TeSys™ island** is a fully digitized and object-oriented load management system and an Industry 4.0 compliant data provider.

It is reducing time to market and is enabling OEMs to move forward in their Industry 4.0 journey.

### Benefits of the object-oriented functional approach

The **TeSys avatar** approach simplifies application and system configuration and reduces engineering tasks. Thus **TeSys™ island** makes the machine engineering and installation phase much faster.

In addition, **TeSys™ island** can be easily integrated into 3<sup>rd</sup> party automation systems and supports several fieldbuses like EtherNet/IP, Modbus TCP, PROFINET and PROFIBUS.

**TeSys™ island** gives users access to all relevant load data for advanced system diagnostics.



## More information

- Watch videos, read documents and use the product selector online on Schneider Electric website.



**TeSys™ island  
catalog:**



> Ref. Document:  
LVCATISL\_EN

**TeSys™ island  
design guides:**

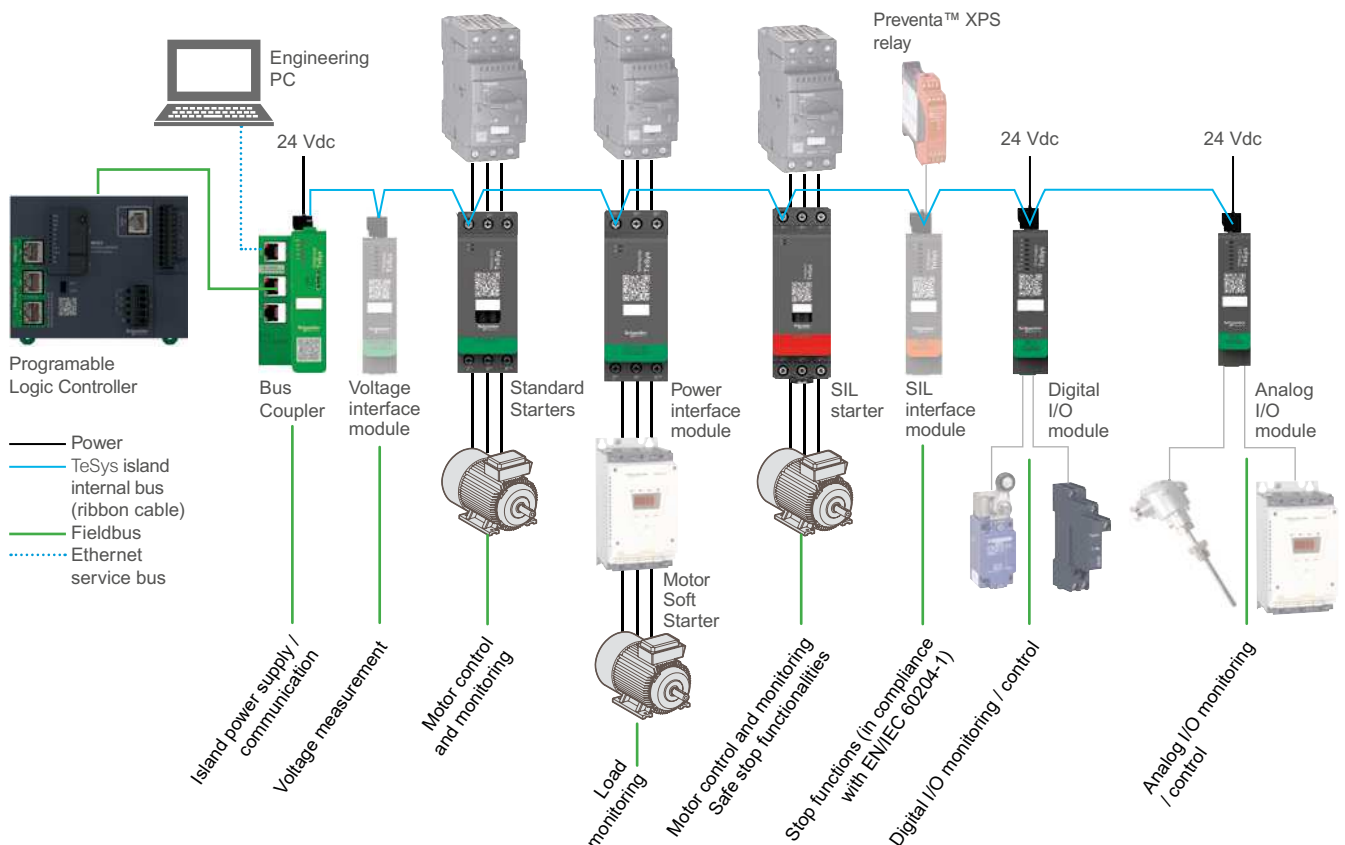
- > 8536IB1901: TeSys™ island System Guide
- > 8536IB1902: TeSys™ island Installation Guide
- > 8536IB1903: TeSys™ island Operating Guide
- > 8536IB1904: TeSys™ island Functional Safety (Safe Stop according to EN 61800-5-2) Guide
- > 8536IB1905: Third Party Function Block Guide and more.

## Main characteristics

- TeSys™ island manages motors and other electrical loads up to 80 A (AC-3) / 37 kW/40 hp
- Fieldbus connectivity via bus coupler for EtherNet/IP, Modbus TCP, PROFINET or PROFIBUS
- Availability of all relevant load data like current, power, energy and advanced diagnostic data
- Simplified engineering and commissioning due to **TeSys avatar** objects and dedicated configuration and maintenance tools
- Up to 20 modules on 1 island mounted on DIN rail (up to 112 cm length)
- No control or auxiliary wiring required, thanks to full connectivity over fieldbus
- All adjustments and setting are digitized, no mechanical dials or dip switches
- Limited number of references including 5 starter sizes, digital & analog I/Os and voltage measurement modules
- SIL starter available for integration into functional safety systems according to IEC 61508, IEC 62061 and ISO 13849-1, including TUV certification (Stop 0 and 1 with wiring categories 1 to 2, suitable for PL c, d and SIL level 2)
- Fully complaint to international standards (IEC / UL / CSA 61010, IEC / UL / CSA 60947, GB/T14018)
- Embedded Cybersecurity (Achilles Level 2).

Control and  
monitoring  
island

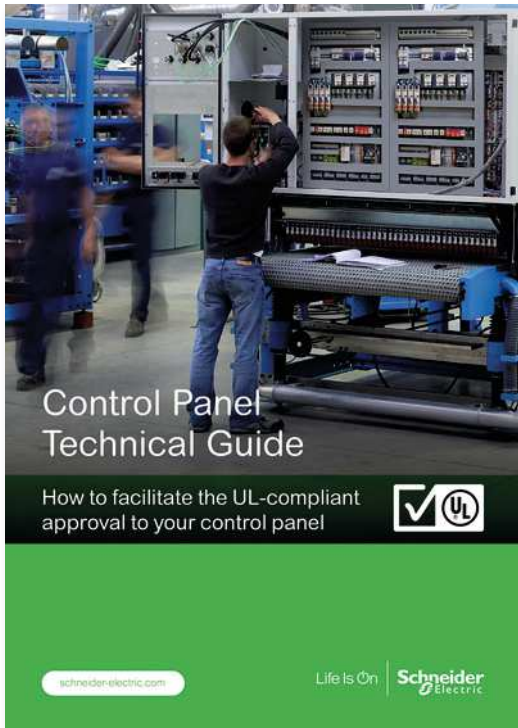
## Modular architecture, thanks to TeSys™ island internal bus





## Control Panel Technical guides

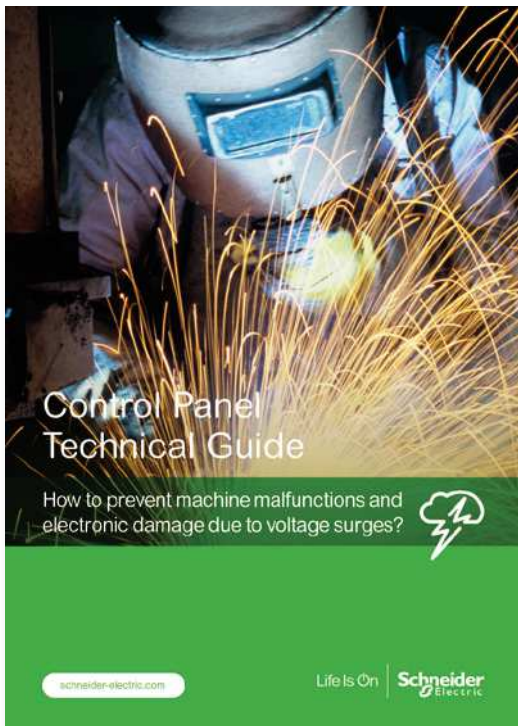
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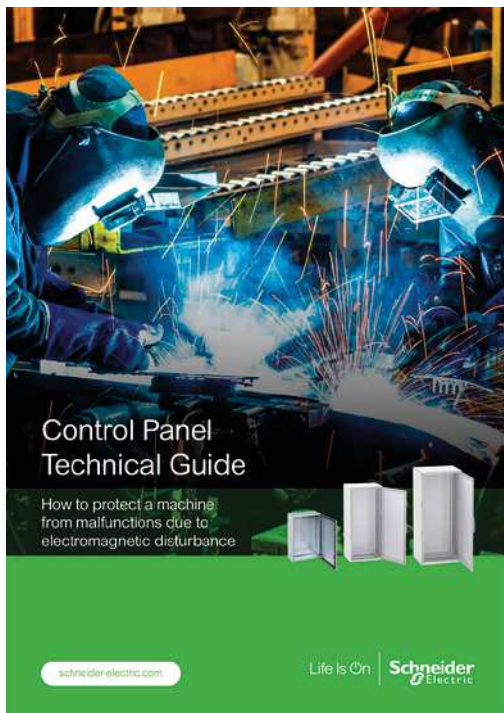
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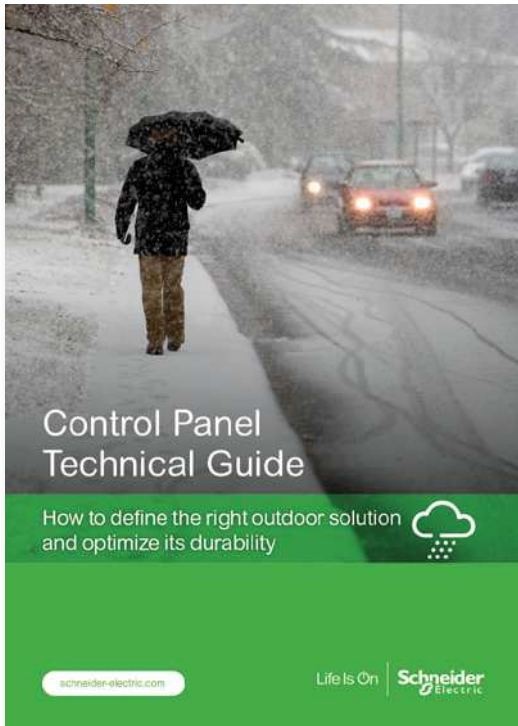
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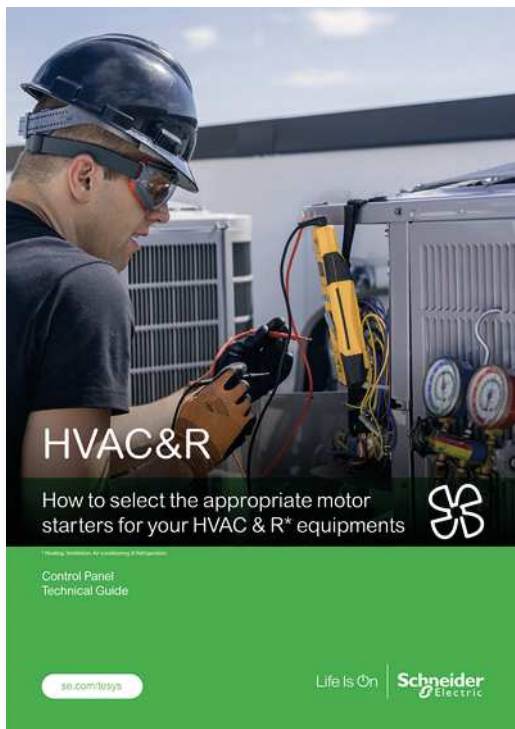
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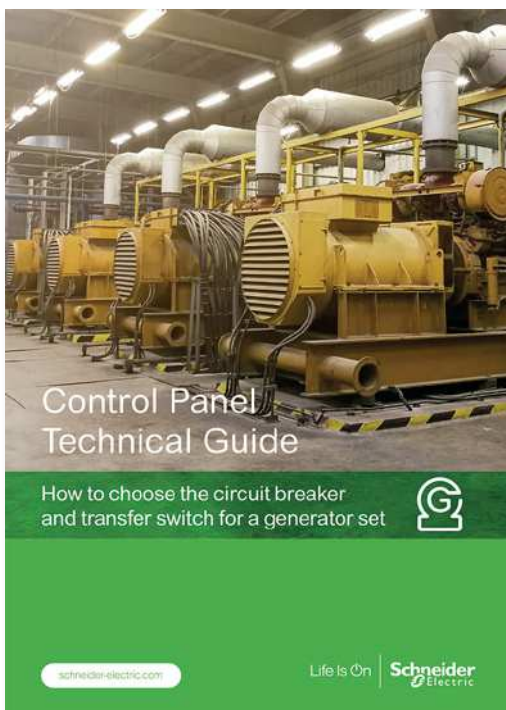
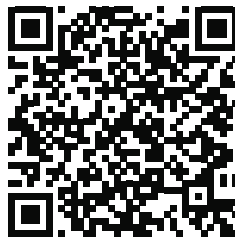


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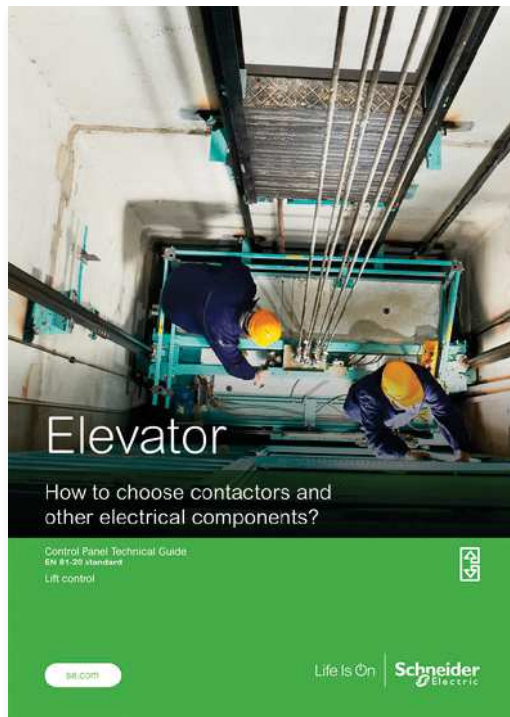
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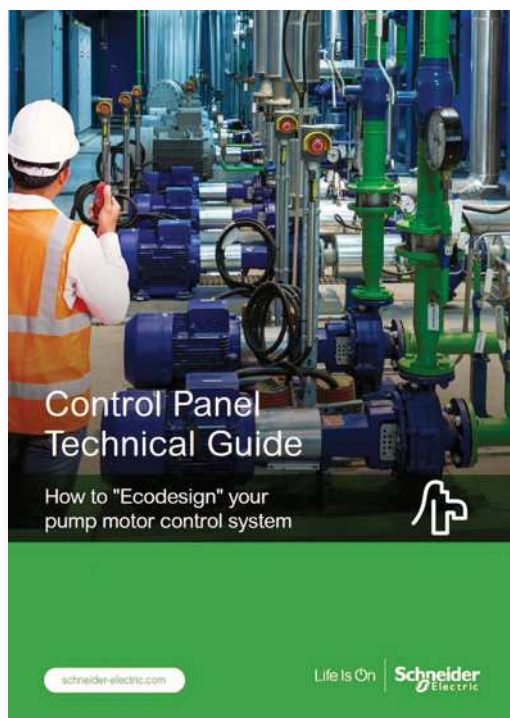


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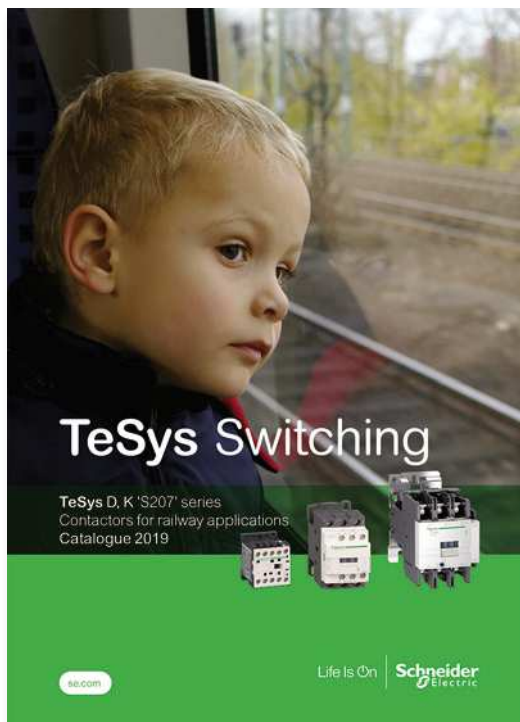
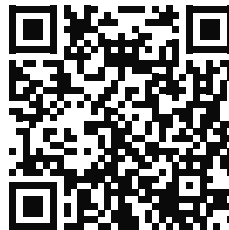


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