

# Ultrasonic sensors.

Detect any object in any environment.



Partnership.
Precise.
Pioneering.

## Visibly better: Baumer sensors.

The Baumer Group is leading at international level in the development and production of sensors, shaft encoders, measuring instruments as well as components for automatic image processing. As an owner-managed family business, we employ about 2400 workers worldwide in 38 subsidiaries and 19 countries. With marked customer orientation, consistently high quality and vast innovation capability, Baumer develops specific solutions for many industries and applications worldwide.

### Our standards – your benefits.

- Passion coupled with expertise both have made us a sensor pioneer and technology leader
- Our range of services is hard to beat we have the right product, developed by our own team, for every task
- Inspiring through innovation a challenge Baumer employees take on every day
- Reliability, precision and quality our customers' requirements are what drives us
- Partnership from the start together with our customers we develop suitable solutions
- Always a step ahead thanks to our production depth, our flexibility and our delivery reliability
- Available worldwide Baumer is Baumer everywhere





# Ultrasonic sensors - multitalented in process automation

Ultrasonic sensors are the allrounders in the world of sensors and are suitable for virtually any detection tasks in industrial applications. They reliably detect transparent or high gloss objects as well as objects of changing color. Being extremely tolerant to dirt, the efficiency of ultrasonic sensors comes into its own especially in harsh working environments, as process reliability is not adversely affected by dust, smoke, mist or similar.

Baumer can look back on years of experience and offers a extensive range of proximity switches, retro-reflective sensors, through-beam sensors and distance measuring sensors with analog switching outputs.

#### Baumer highlights:

- Narrow sonic beams for detection in the smallest openings.
- High-speed sensors with a response time of only 1.3 ms
- Sturdy sensors for use in the most demanding environments (e.g. washdown, ATEX etc.)
- Distance measuring ultrasonic sensors for detection ranges up to 6000 mm
- Sensors in chemical-resistant design



Learn more.

Downloadable data sheets as well as further information about our products is available at:

www.baumer.com/ultrasonic



# Table of contents.

4
8
9
10
11
ensors
16
18
20
32
46
47
48
52
58
60
62
72

Ultrasonic through beam sensors	
Introduction	80
Rectangular designs	82
Ultrasonic distance sensors	
Introduction	86
Overview	88
Rectangular designs	92
Cylindrical designs	113
Accessories	
Connectors	126
Connectors/Pin assignment	129
Mounting accessories	130
Mounting kits SENSOFIX	133
Quick reference list	
Quick reference list A – Z	134

### Ultrasonic Miniature sensors

Baumer offers a large portfolio of small and light miniaturized ultrasonic sensors for very cramped spaces.

- Wide range of round and rectangular designs
- Proximity switches, retro-reflective and trough beam sensors as well as distance sensors
- Sensing distances up to 400 mm
- Narrow sonic beam for object detection in even the smallest openings
- Lightweight with only 4 grams



# Distance measurement in micro grippers

 Thanks to the small design and the low weight, miniature ultrasonic sensors can also be installed in microgrippers, which offer only little space for sensors.

#### **Detailed information:**

- Miniature proximity switches ... page 20
- Miniature retro-reflective sensors ...page 62
- Miniature distance sensors ...page 92



### Height measurement

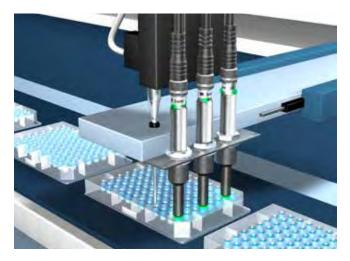
 Miniature ultrasonic sensors reliably measure the distance to the object, regardless of surface color, reflectivity or transparency.



### Liquid level detection

 Miniaturized ultrasonic sensors are ideally suited to measure liquid levels in small containers. The miniature housing design allows the installation of several sensors in close proximity.

# Fast and robust — always the right solution



### High-speed ultrasonic sensors

With a response time of only 1.3 ms, Baumer high-speed ultrasonic sensors ate up to 10 times faster than offered to date. This makes them comparable with optical sensors and means that the reputation of the slow ultrasonic sensor belongs to the past.

These ultrasonic sensors are specially designed for the detection of fast-moving, transparent and closely spaced objects even in surroundings susceptible to soiling.

#### The highlights:

- Response times <1.3 ms for detecting fast moving objects
- Sensing distances up to 70 mm
- Vertical and horizontal repeat accuracy of up to 0.5 mm
- No blind region
- Variants with a narrow sonic nozzle for detection in the smallest openings (down to Ø 3 mm)

#### **Detailed information:**

- High-speed proximity switches ...page 18
- High-speed retro-reflective sensors ... page 72



## Robust ultrasonic sensors for use in harsh ambient conditions

Our robust UNAR series ultrasonic sensors are suitable for the detection of aggressive media in difficult or sensitive environments. They measure acid and lye levels as well as accurately detect objects in the vicinity of solvents. They do all of this completely reliably thanks to their special design.

#### The highlights:

- High chemical resistance thanks to Parylene-coated sensor front
- Robust V4A stainless steel enclosure
- Consistent use of FDA-compliant materials
- Pressure-resistant sensor front up to 6 bar
- Range of up to 1 m
- Constant resolution of 0.3 mm

#### **Detailed information:**

- Robust proximity switches ...page 40
- Robust retro-reflective sensors ... page 74

# Ultrasonic sensors with extra capacity — U500

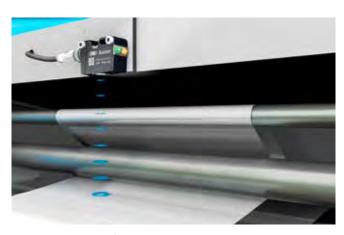


#### Universally applicable and extremely resilient

- Large sensing distances up to 1000 mm
- Easy commissioning and operation
- Maximum process safety thanks to expanded reserve capacity
- Very robust thanks to extremely resilient transducer

#### **Detailed information:**

- U500 proximity sensors ... page 31
- U500 retro-reflective sensors ... page 70
- U500 distance sensors ... page 110



#### Reliable and flexible in use

- Ultrasonic sensors enable detection of transparent, high-gloss and multicolor objects
- Greatest range in its class (1000 mm) opens up new application potential
- Reliable operation thanks to enhanced interference immunity



### Liquid and solid media in every environment

- The sensors are ideal for monitoring fill level of liquids, granules, and bulk material
- Slender, symmetrical sonic cone enables detection even in small container openings
- Fast cycle times in process applications are possible thanks to short response times

### Precise Ultrasonic sensors



# Distance measurement to transparent objects

- Precise distance measurements for controlling the material feed of transparent films (sag control).
- Reliable detection of foil breaks or small cracks in the material of transparent foils even in fast applications
- Edge control with transparent materials

Ultrasonic distance sensors allow an accurate distance measurement regardless of material, surface, color or transparency.

- Small and light miniature sensors, e.g. for robotics
- Measurements in very small containers or openings
- Large measuring ranges up to 6000 mm
- Sturdy sensors also for demanding environments

#### **Detailed information:**

Distance sensors ... page 86



#### Determination of roll diameter

 Measurement of outside diameters of rolls with materials such as plastic film, metal sheet, paper and cardboard, veneer, etc.



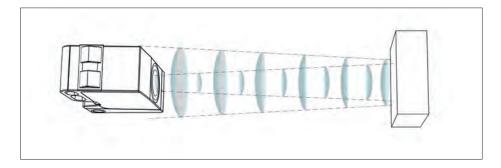
#### Level control

- The sensors are predestined for monitoring the fill level of liquids, granules and bulk material
- High cycle times in process process thanks to short response times

Target detection

#### Design and operation

A special sonic transducer is used for the ultrasonic proximity sensors, which allows for alternate transmission and reception of sound waves. The sonic waves emitted by the transducer are reflected by an object and received back in the transducer. After having emitted the sound waves, the ultrasonic sensor will switch to receive mode. The time elapsed between emitting and receiving is proportional to the distance of the object from the sensor.



#### Digital output

Sensing is only possible within the detection area. The required sensing range can be adjusted with the sensor's potentiometer or by electronic Teach-in (Teach-in button or remote Teach-in). If an object is detected within the set area, the output will change state which is visualized by the integrated LED.

Sonic waves are best reflected from hard surfaces. Targets may be solids, liquids, granules or powders. In general, ultrasonic sensors are deployed for object detection where optical principles would lack reliability.

#### Standard target

The standard target is defined as a square flat object of following sizes:

- 15 x 15 mm for Sde up to 250 mm
- 30 x 30 mm for Sde up to 1000 mm
- 100 x 100 mm for Sde > 1000 mm

The target should be mounted perpendicular to the axis of the sensor.

#### Size

To ensure a reliable object detection, the reflected signal must be large enough. The intensity of the signal depends on the size of the object. Using a standard object, the full scanning distance Sd is available.

#### Surfaces

Detection of sound absorbent materials will result in a reduction of the maximum sensing distance.

The maximum sensing distance can be achieved as long as the maximum roughness of the object does not exceed 0,2 mm.

Typical sound absorbing materials are:

- foam rubber
- cotton / wool / cloth / felt
- · very porous materials

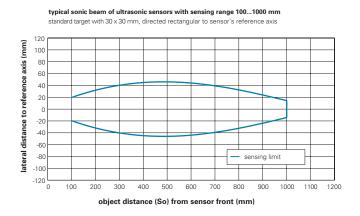
8

#### Sonic cone profiles

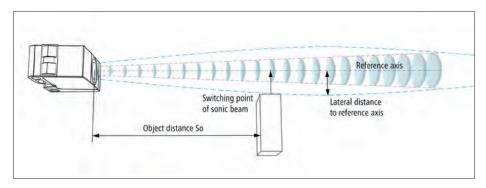
The sonic cone profile charts as found in the spec sheets of this catalog represent the active sensing areas for ultrasonic sensors. The charts demonstrate the short-range sonic side lobes, which widen the sensor's close-range aperture angle. Due to sound absorption and air diffusion, the lobes decrease at longer ranges.

Size, shape, surface properties and the direction of target detection have very high influence on the lateral detecting region of an ultrasonic sensor.

Sonic cone profiles apply to the whole product family, e.g. a 100 - 1000 mm profile is representative for all related sensors of the same sensing range - digital or analog outputs, etc.



#### Measuring method



Standard square targets made of steel are used to determine the shape of typical sonic cone profiles.

- 15 x 15 mm for Sde up to 250 mm
- 30 x 30 mm for Sde up to 1000 mm
- 100 x 100 mm for Sde > 1000 mm

The targets are positioned perpendicularly to the sensor's reference axis, approached sideways at different distances. The sonic cone profile is then plotted by connecting the measured points with a line.

The cone shape can vary if round or differently shaped objects are detected.

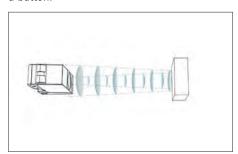
### Ultrasonic sensor principles – the right solution for any application

#### Sensor principles

Most ultrasonic sensors are based on the principle of measuring the propagation time of sound between send and receive (proximity switch). The barrier principle determines the distance from the sensor to the reflector (retro-reflective sensor) or to an object (through-beam sensor) in the measuring range.

#### **Proximity switches**

Ultrasonic proximity switches are the simplest form of ultrasonic object detection. The transmitter and receiver are integrated in one housing. The ultrasound is reflected directly from the object to be measured to the receiver. Ultrasonic sensors with teach-in function differ from conventional types in that they offer easier and more varied operability with the simple push of a button.

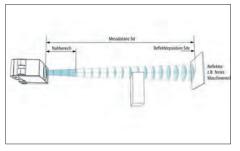


#### Typical applications:

- Distance measurement
- Stack height measurement

#### Retro-reflective sensors

The retro-reflective sensor operates in accordance with the same principle as the ultrasonic proximity switch. Sound propagation measurement determines the distance from the sensor to the reflector or to an object in the measuring range. Any sound reflecting, stationary object can be used as the reflector.

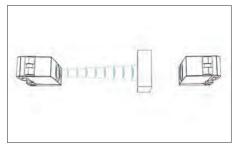


#### Typical applications:

- Irregularly shaped and inclined objects
- Sound deflecting target objects
- Sound absorbing materials such as cotton and foam rubber

#### Through beam sensors

Ultrasonic through-beam sensors have short response times and large ranges. The transmitter and receiver are accommodated in two separate housings. The transmitter permanently emits sound waves through air to the receiver. The receiver switches through the output stage when an object interrupts the sound waves.



#### Typical applications:

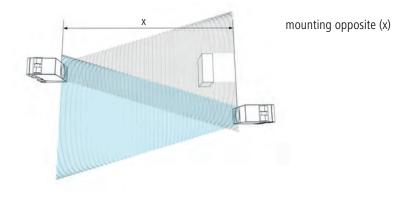
- Detection of object in fast succession
- Counting objects from materials that are difficult to detect (glass containers, PET bottles)
- Monitoring transparent materials
- Film break monitoring
- Level monitoring in tanks and silos

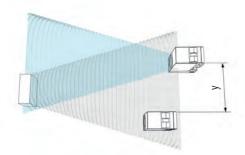
### Mounting

Baumer ultrasonic sensors offer a high degree of flexibility in installation. The only prerequisite during mounting is to ensure that no materials can settle in the area of the sonic beam. Sound-absorbing materials such as cotton wool or soft foam rubber can reduce the scanning range. Liquids and solid materials are very good reflectors of sound.

#### Minimum spacings

To avoid mutual influencing of the sensors, depending on the type of sensor, a specific spacing must be maintained between the sensors:





mounting parallel (y)

#### Minimum spacings table

Sensor type	Х	у	max. no. of sensors	Action to take	max. control wire	Response time
Standard - without mul- tiplex or synch.	3 x scanning range Sd	2 x Sd	no limit	none	-	according to technical specs.
with multiplex feature	2 x scanning range Sd	no space required	2	connect control pin	5 m	2 x technical specs.
with synchronization feature	3 x scanning range Sd	1 x Sd	8	connect control pin	7 m	according to technical specs.

## Synchronization or Multiplex feature

Minimum spacing cannot always be maintained in all applications. Sensors with synchronization mode are used for this purpose. Such sensors synchronize the transfer cycles of the individual sensors with the aim of reducing the minimum spacing.

#### Synchronization feature

Link the control pin of all sensors within a limited area to each other. This triggers the measurement of all sensors at the same time. Interference signals which arrive later at the sensor due to their longer sensing distance, will be ignored. Up to eight sensors can be synchronized via control pin.

#### Multiplex feature

Link the control pin of both sensors to each other. While the first sensor is measuring, the second is disabled. After the first measurement is completed, the second sensor is allowed to send and receive its signals. In maximum two sensors can be interconnected. The multiplex function increases the sensor response time to the double of the specified value.

Note: The control pin must be closed on sensors utilizing either the synchronization or multiplex feature. If the feature is not in use the pin must be connected to the following potentials to ensure the standard response time:

Synchronization: Connect the control pin to supply voltage (+Vs)

Multiplex: Connect the control pin to ground (GND)





## Proximity sensors

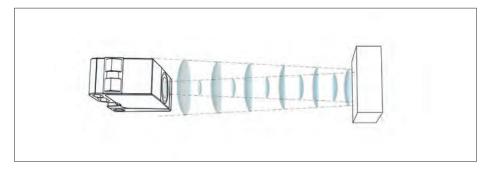
Introduction	Page 16
Overview	Page 18
Rectangular designs	Page 20
Cylindrical designs	Page 32

www.baumer.com 15



#### Design and operation

A special sonic transducer is used for the ultrasonic proximity sensors, which allows for alternate transmission and reception of sound waves. The transducer emits a number of sonic waves which are reflected by an object, back to the transducer. After emission of the sound waves, the ultrasonic sensor will switch to receive mode. The time elapsed between emitting and receiving is proportional to the distance of the object from the sensor.



#### Digital output

Sensing is only possible within the detection area. The required sensing range can be adjusted with the sensor's potentiometer. If an object is detected within the set area, the output changes its state. The built-in LED indicates this change.

#### ... with Teach-in

#### Teach-in procedures

All adjustments are carried out via the internal Teach-in button or the external Teach-in wire.

#### Adjustment switching point Sde

- 1. Adjustment mode: Press the Teach-in button or connect the white Teach-in wire to +Vs for approx. 2 secs until the LED flashes green. Release the button or disconnect Teach-in wire.
- 2. LED flashes green. Place the target at the required scanning range and press the Teach-in button or connect the external white Teach-in wire shortly to +Vs.
- 3. Successful completion of Teach-in procedure is confirmed by LED being "on" for approx. 2 secs.

#### Teach-in lock

The Teach-in function is locked five minutes after power up or five minutes after the end of the last Teach-in process.

#### Resetting to original factory settings

Holding the button down or connecting the white Teach-in wire to  $\pm Vs$  for > 6 secs, will automatically restore the original factory setting. Fast flashing of the LED indicates successful completion of the resetting.

qTeach™

With  $qTeach^{TM}$  we are introducing a new, convenient and wear-free teach procedure. Teaching of 0500 sensors is just by a touch with any ferromagnetic tool. A blue LED light provides clear optical feedback. To prevent user errors,  $qTeach^{TM}$  locks autonomously after 5 minutes.

6 www.baumer.com









### rectangular designs

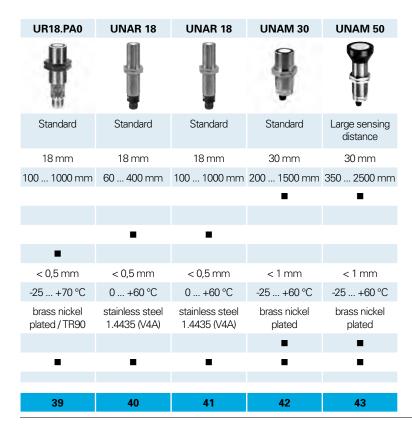
product family	UNCK 09	UNCK 09	UNDK 09	UNDK 09	UNDK 10	UNDK 20	UNDK 20
			0		•	P	P
	Miniature	Miniature with beam columnator	Miniature	Miniature with beam columnator	Miniature	Standard	Standard
width / diameter	8,6 mm	8,6 mm	8,6 mm	8,6 mm	10,4 mm	20 mm	20 mm
scanning range Sd	30 200 mm	3 150 mm	30 200 mm	3 150 mm	10 200 mm	10 200 mm	40 400 mm
potentiometer							
Teach-in	•	•	=	•	•	•	•
qTeach							
repeat accuracy	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm
operating temperature	0 +60 °C	0 +60 °C	0 +60 °C	0 +60 °C	-10 +60 °C	-10 +60 °C	-10 +60 °C
housing material	PA 12	PA 12	PA 12	PA 12	plastic (ASA)	polyester	polyester
cable PUR 4 x 0,08, 2 m	•		•	•			
cable PUR 4 x 0,25, 2 m							
cable, 2 m							
flylead connector M8, L=200 mm	•		•	•			
connector M8					•	•	•
connector M12							
page	20	21	22	23	24	25	26

### cylindrical designs

product family	UNAM 12	UNAM 18	UNAM 18				
			II.	#	Į.	+	
special type	High-speed	Standard	High-speed	Standard	Standard	Standard	Standard
width / diameter	12 mm	18 mm	18 mm				
scanning range Sd	0 40 mm	5 70 mm	10 70 mm	10 200 mm	40 400 mm	100 700 mm	100 1000 mm
potentiometer							
external Teach-in	-	•	•	•	•		
Teach-in							-
qTeach							
repeat accuracy	< 0,5 mm						
operating temperature	-10 +60 °C	0 +60 °C	-10 +60 °C	-10 +60 °C	-10 +60 °C	-10 +60 °C	-10 +60 °C
housing material	brass nickel plated						
cable, 2 m						•	
connector M12	•	•	•	•	•		•
page	32	33	34	35	36	37	38

18 www.baumer.com

UNDK 20	UNDK 30	UNDK 30	UNDK 30	U500.PA0
P		F	F	
Standard	Standard	Standard	Standard	Extra performance
20 mm	30 mm	30 mm	30 mm	18 mm
100 1000 mm	30 250 mm	60 400 mm	100 1000 mm	100 1000 mm
	•	•	•	
•				
				•
< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm
-10 +60 °C	-25 +60 °C	-25 +60 °C	-10 +60 °C	-25 +65 °C
polyester	polyester / die-cast zinc	polyester / die-cast zinc	polyester / die-cast zinc	plastic (ASA, PMMA)
				-
	•	•	-	
•				
	•	•	•	•
27	28	29	30	31



#### Sd = 200 mm

- short response time
- high resolution
- detects the smallest objects

general data	
scanning range Sd	30 200 mm
scanning range far limit Sde	30 200 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 7 ms
release time toff	< 7 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green LED / red LED
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	55 mm
depth	24,5 mm
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67

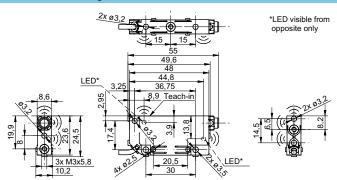
#### connectors and mating connectors

ESG 32AH0200	Connector M8, 4 pin, straight, 2 m			
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m			
additional cable connectors and field wireable connectors: see				
accessories				

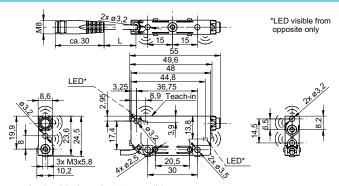
order reference	connection types
UNCK 09G8914	cable PUR 4 x 0,08, 2 m
UNCK 09G8914/KS35A	flylead connector M8, L=200 mm



#### dimension drawing

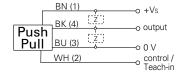


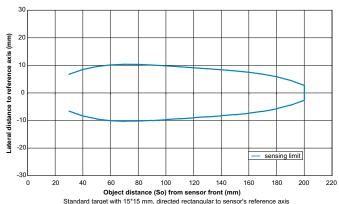
#### flylead connector version



standard cable length 200 mm (L)

#### connection diagram





**ONCK 09** 

#### Sd = 150 mm

- measurement in very small containers
- stackability in a 9 mm pitch
- short response time

general data	
scanning range Sd	3 150 mm
scanning range far limit Sde	3 150 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 7 ms
release time toff	< 7 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green LED / red LED
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	82 mm
depth	24,5 mm
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67

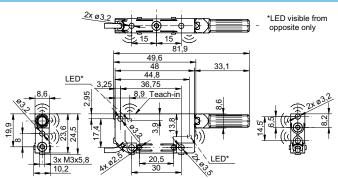
#### connectors and mating connectors

ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable co	nnectors and field wireable connectors: see
accessories	

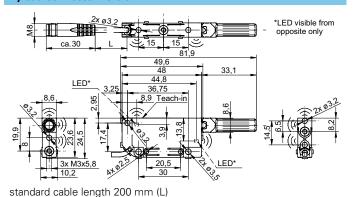
order reference	connection types
UNCK 09G8914/D1	cable PUR 4 x 0,08, 2 m
UNCK 09G8914/KS35AD1	flylead connector M8, L=200 mm



### dimension drawing

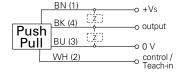


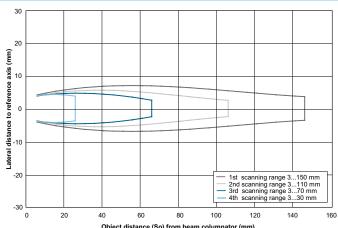
#### flylead connector version



standard cable length 200 mm

#### connection diagram





Object distance (So) from beam columnator (mm)
Standard target with 15\*15 mm, directed rectangular to sensor's reference axis



#### Sd = 200 mm

- short response time
- detects the smallest objects
- internal and external Teach-in

scanning range Sd 30 200 mm  scanning range far limit Sde 30 200 mm  hysteresis typ. 4 % Sde  repeat accuracy < 0,5 mm  temperature drift < 0,18 % Sde/K  response time ton < 7 ms  release time toff < 7 ms  sonic frequency 380 kHz  adjustment Teach-in alignment aid target indication flashing output indicator green LED / red LED  electrical data  voltage supply range +Vs 12 30 VDC  current consumption max. (no load) output circuit push-pull output circuit push-pull output current < 100 mA  voltage drop Vd < 2 VDC  residual ripple < 10 % Vs  short circuit protection yes  mechanical data  type rectangular housing material PA 12 width / diameter 8,6 mm  height / length 48,8 mm  ambient conditions  operating temperature 0 +60 °C		
secanning range far limit Sde hysteresis typ. 4 % Sde repeat accuracy 4 % Sde 7 ms 8 sole 7 ms 8 sole 8 kHz 8 accuracy 8 reach-in 8 alignment aid 8 target indication flashing 8 green LED / red LED 8 reach-in 8 and VDC 8 accurrent consumption max. (no 8 aload) 8 accurrent consumption max. 8 accuracy	general data	
hysteresis typ. 4 % Sde repeat accuracy < 0,5 mm  temperature drift < 0,18 % Sde/K response time ton < 7 ms release time toff < 7 ms sonic frequency 380 kHz adjustment Teach-in alignment aid target indication flashing output indicator green LED / red LED  electrical data voltage supply range +Vs 12 30 VDC current consumption max. (no load) output circuit push-pull output current < 100 mA voltage drop Vd < 2 VDC residual ripple < 10 % Vs short circuit protection yes reverse polarity protection yes mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 48,8 mm ambient conditions operating temperature 0 +60 °C	scanning range Sd	30 200 mm
repeat accuracy < 0,5 mm  temperature drift < 0,18 % Sde/K  response time ton < 7 ms  release time toff < 7 ms  sonic frequency 380 kHz  adjustment Teach-in alignment aid target indication flashing output indicator green LED / red LED  electrical data voltage supply range +Vs 12 30 VDC  current consumption max. (no load) output circuit push-pull output current < 100 mA  voltage drop Vd < 2 VDC  residual ripple < 10 % Vs  short circuit protection yes  reverse polarity protection yes  mechanical data  type rectangular housing material PA 12 width / diameter 8,6 mm height / length 48,8 mm  ambient conditions operating temperature 0 +60 °C	scanning range far limit Sde	30 200 mm
temperature drift < 0,18 % Sde/K response time ton < 7 ms release time toff < 7 ms sonic frequency 380 kHz adjustment Teach-in alignment aid target indication flashing output indicator green LED / red LED electrical data voltage supply range +Vs 12 30 VDC current consumption max. (no load) output circuit push-pull output current < 100 mA voltage drop Vd < 2 VDC residual ripple < 10 % Vs short circuit protection yes mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 48,8 mm ambient conditions operating temperature 0 +60 °C	hysteresis typ.	4 % Sde
response time ton < 7 ms  release time toff < 7 ms  sonic frequency 380 kHz  adjustment Teach-in  alignment aid target indication flashing output indicator green LED / red LED  electrical data voltage supply range +Vs 12 30 VDC current consumption max. (no load) output circuit push-pull output current < 100 mA  voltage drop Vd < 2 VDC residual ripple < 10 % Vs short circuit protection yes reverse polarity protection yes mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 48,8 mm  ambient conditions operating temperature 0 +60 °C	repeat accuracy	< 0,5 mm
release time toff < 7 ms  sonic frequency 380 kHz  adjustment Teach-in  alignment aid target indication flashing output indicator green LED / red LED  electrical data  voltage supply range +Vs 12 30 VDC  current consumption max. (no load) output circuit push-pull output current < 100 mA  voltage drop Vd < 2 VDC  residual ripple < 10 % Vs  short circuit protection yes reverse polarity protection yes  mechanical data  type rectangular housing material PA 12 width / diameter 8,6 mm height / length 48,8 mm  ambient conditions operating temperature 0 +60 °C	temperature drift	< 0,18 % Sde/K
sonic frequency adjustment alignment aid cutput indicator green LED / red LED  electrical data voltage supply range +Vs current consumption max. (no load) cutput circuit cutput current voltage drop Vd residual ripple short circuit protection reverse polarity protection reverse polarity protection material type rectangular housing material push-pull voltage drop Vd ves short circuit protection reverse polarity protection reverse polarity protection rectangular housing material PA 12 width / diameter height / length depth ambient conditions operating temperature  0 +60 °C	response time ton	< 7 ms
adjustment adjustment adjustment alignment aid target indication flashing green LED / red LED  electrical data  voltage supply range +Vs 12 30 VDC  current consumption max. (no load)  output circuit push-pull  output current < 100 mA  voltage drop Vd < 2 VDC  residual ripple < 10 % Vs  short circuit protection yes  mechanical data  type rectangular  housing material PA 12  width / diameter 8,6 mm  height / length 48,8 mm  depth 30,5 mm  ambient conditions  operating temperature 0 +60 °C	release time toff	< 7 ms
alignment aid target indication flashing output indicator green LED / red LED  electrical data  voltage supply range +Vs 12 30 VDC  current consumption max. (no load)  output circuit push-pull  output current < 100 mA  voltage drop Vd < 2 VDC  residual ripple < 10 % Vs  short circuit protection yes  mechanical data  type rectangular  housing material PA 12  width / diameter 8,6 mm  height / length 48,8 mm  ambient conditions  operating temperature 0 +60 °C	sonic frequency	380 kHz
electrical data  voltage supply range +Vs 12 30 VDC  current consumption max. (no load)  output circuit push-pull  output current < 100 mA  voltage drop Vd < 2 VDC  residual ripple < 10 % Vs  short circuit protection yes  reverse polarity protection yes  mechanical data  type rectangular  housing material PA 12  width / diameter 8,6 mm  height / length 48,8 mm  ambient conditions  operating temperature 0 +60 °C	adjustment	Teach-in
electrical data  voltage supply range +Vs	alignment aid	target indication flashing
voltage supply range +Vs  current consumption max. (no load)  output circuit  output current  voltage drop Vd  residual ripple  short circuit protection  reverse polarity protection  rectangular  type  rectangular  housing material  pA 12  width / diameter  height / length  depth  ambient conditions  output circuit prays and push-pull  voltage drop Vd  voltage	output indicator	green LED / red LED
current consumption max. (no load)  output circuit push-pull  output current < 100 mA  voltage drop Vd < 2 VDC  residual ripple < 10 % Vs  short circuit protection yes  reverse polarity protection yes  mechanical data  type rectangular  housing material PA 12  width / diameter 8,6 mm  height / length 48,8 mm  depth 30,5 mm  ambient conditions  operating temperature 0 +60 °C	electrical data	
load) output circuit push-pull output current < 100 mA voltage drop Vd < 2 VDC residual ripple < 10 % Vs short circuit protection yes reverse polarity protection yes mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 48,8 mm depth 30,5 mm ambient conditions operating temperature 0 +60 °C	voltage supply range +Vs	12 30 VDC
output current < 100 mA  voltage drop Vd < 2 VDC  residual ripple < 10 % Vs  short circuit protection yes  reverse polarity protection yes  mechanical data  type rectangular  housing material PA 12  width / diameter 8,6 mm  height / length 48,8 mm  depth 30,5 mm  ambient conditions  operating temperature 0 +60 °C	current consumption max. (no load)	35 mA
voltage drop Vd < 2 VDC residual ripple < 10 % Vs short circuit protection yes reverse polarity protection yes mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 48,8 mm depth 30,5 mm ambient conditions operating temperature 0 +60 °C	output circuit	push-pull
residual ripple < 10 % Vs short circuit protection yes reverse polarity protection yes mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 48,8 mm depth 30,5 mm ambient conditions operating temperature 0 +60 °C	output current	< 100 mA
short circuit protection yes reverse polarity protection yes  mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 48,8 mm depth 30,5 mm  ambient conditions operating temperature 0 +60 °C	voltage drop Vd	< 2 VDC
reverse polarity protection  mechanical data  type rectangular  housing material PA 12  width / diameter 8,6 mm  height / length 48,8 mm  depth 30,5 mm  ambient conditions  operating temperature 0 +60 °C	residual ripple	< 10 % Vs
type rectangular housing material PA 12 width / diameter 8,6 mm height / length 48,8 mm depth 30,5 mm ambient conditions operating temperature 0 +60 °C	short circuit protection	yes
type rectangular housing material PA 12 width / diameter 8,6 mm height / length 48,8 mm depth 30,5 mm ambient conditions operating temperature 0 +60 °C	reverse polarity protection	yes
housing material PA 12 width / diameter 8,6 mm height / length 48,8 mm depth 30,5 mm ambient conditions operating temperature 0 +60 °C	mechanical data	
width / diameter 8,6 mm height / length 48,8 mm depth 30,5 mm ambient conditions operating temperature 0 +60 °C	type	rectangular
height / length 48,8 mm  depth 30,5 mm  ambient conditions operating temperature 0 +60 °C	housing material	PA 12
depth 30,5 mm  ambient conditions  operating temperature 0 +60 °C	width / diameter	8,6 mm
ambient conditions operating temperature 0 +60 °C	height / length	48,8 mm
operating temperature 0 +60 °C	depth	30,5 mm
- Program 2 composition	ambient conditions	
protection class IP 67	operating temperature	0 +60 °C
p. 0.000	protection class	IP 67

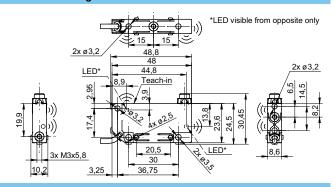
#### connectors and mating connectors

ESG 32AH0200	Connector M8, 4 pin, straight, 2 m	
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		
accessories		

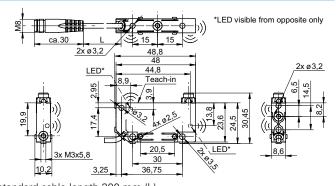
order reference	connection types
UNDK 09G8914	cable PUR 4 x 0,08, 2 m
UNDK 09G8914/KS35A	flylead connector M8, L=200 mm



#### dimension drawing

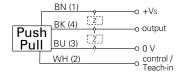


#### flylead connector version

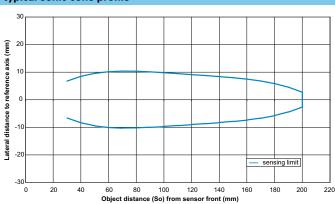


standard cable length 200 mm (L)

#### connection diagram



#### typical sonic cone profile



Standard target with 15\*15 mm, directed rectangular to sensor's reference axis

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#### Sd = 150 mm

- measurement in very small containers
- stackability in a 9 mm pitch
- short response time

general data	
scanning range Sd	3 150 mm
scanning range far limit Sde	3 150 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 7 ms
release time toff	< 7 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green LED / red LED
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	48,8 mm
depth	57,7 mm
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67

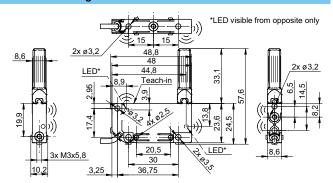
#### connectors and mating connectors

ESG 32AH0200	Connector M8, 4 pin, straight, 2 m	
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		
accessories		

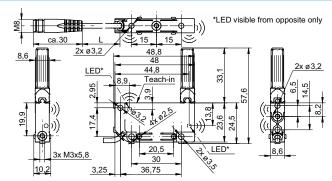
order reference	connection types
UNDK 09G8914/D1	cable PUR 4 x 0,08, 2 m
UNDK 09G8914/KS35AD1	flylead connector M8, L=200 mm



#### dimension drawing

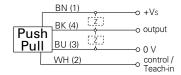


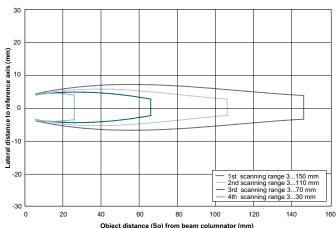
#### flylead connector version



standard cable length 200 mm (L)

#### connection diagram





Object distance (So) from beam columnator (mm)
Standard target with 15\*15 mm, directed rectangular to sensor's reference axis

#### Sd = 200 mm

- · compact housing
- very low mass (4 g)
- long sensing range / small blind range

<ul> <li>long sensing range / sma</li> </ul>	li blind range
general data	
scanning range Sd	10 200 mm
scanning range far limit Sde	30 200 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 15 ms
release time toff	< 15 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	plastic (ASA)
width / diameter	10,4 mm
height / length	27 mm
depth	14 mm
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67
connectors and mating connect	tors
ESG 32AH0200 Connector M8	3, 4 pin, straight, 2 m
ESW 31AH0200 Connector M8	3, 4 pin, angular, 2 m

LOG 02/ 11 10200	connector wo, 4 pm, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable cor	nnectors and field wireable connectors: see

accessories

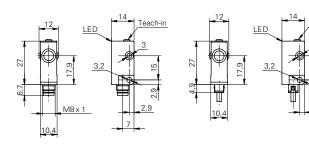
accessories	
Accessories	
10150326	Sensofix series 10 / series 20
10133792	Mounting bracket series 10 (L design)
10114501	Mounting bracket series 10 (U design)
10162083	Mounting panel for sensors series 10
10118798	Mounting bracket series 10
10162376	Sonic beam deflector for ultrasonic sensors series 10

for details: see accessories section

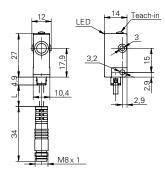




#### dimension drawings

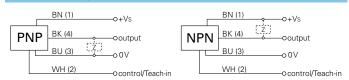


#### flylead connector version

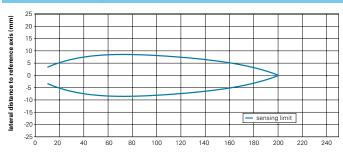


standard cable length 200 mm (L)

#### connection diagrams



#### typical sonic cone profile



standard square target, size  $15 \times 15 \, \text{mm}$ , positioned perpendicularly to sensor's reference axis

order reference	output circuit	connection types
UNDK 10N8914	NPN make function (NO) / break function (NC)	cable, 2 m
UNDK 10N8914/KS35A	NPN make function (NO) / break function (NC)	flylead connector M8, L=200 mm
UNDK 10N8914/S35A	NPN make function (NO) / break function (NC)	connector M8
UNDK 10P8914	PNP make function (NO) / break function (NC)	cable, 2 m
UNDK 10P8914/KS35A	PNP make function (NO) / break function (NC)	flylead connector M8, L=200 mm
UNDK 10P8914/S35A	PNP make function (NO) / break function (NC)	connector M8

#### Sd = 200 mm

- internal and external Teach-in
- small sonic beam angle

general data	
scanning range Sd	10 200 mm
scanning range far limit Sde	30 200 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 10 ms
release time toff	< 10 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

#### connectors and mating connectors

ESG 32AH0200	Connector M8, 4 pin, straight, 2 m	
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		

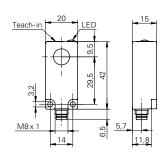
accessories

Accessories	
10150326	Sensofix series 10 / series 20
10153290 Sonic beam deflector series 20	
for details: see accessories section	

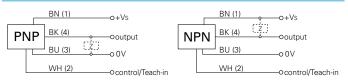
order reference	output circuit
UNDK 20N6914/S35A	NPN make function (NO)
UNDK 20N7914/S35A	NPN break function (NC)
UNDK 20P6914/S35A	PNP make function (NO)
UNDK 20P7914/S35A	PNP break function (NC)



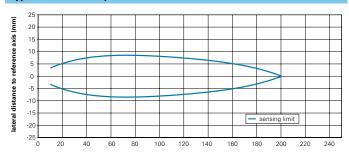
#### dimension drawing



#### connection diagrams



#### typical sonic cone profile



standard square target, size  $15 \times 15 \text{ mm}$ , positioned perpendicularly to sensor's reference axis

#### Sd = 400 mm

- internal and external Teach-in
- wide sonic beam angle

general data	
scanning range Sd	40 400 mm
scanning range far limit Sde	60 400 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 25 ms
release time toff	< 25 ms
sonic frequency	290 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

#### connectors and mating connectors

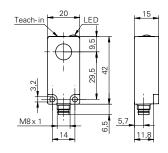
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m	
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		
accessories		

Accessories	
10150326	Sensofix series 10 / series 20
10153290 Sonic beam deflector series 20	
for details: see accessories section	

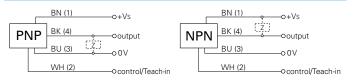
order reference	output circuit
UNDK 20N6912/S35A	NPN make function (NO)
UNDK 20N7912/S35A	NPN break function (NC)
UNDK 20P6912/S35A	PNP make function (NO)
UNDK 20P7912/S35A	PNP break function (NC)

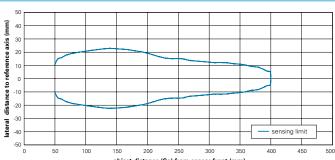


#### dimension drawing



#### connection diagrams





object distance (So) from sensor front (mm)
standard target with 30 x 30mm, directed rectangular to sensor's reference axis

#### Sd = 1000 mm

- internal and external Teach-in
- long sensing range

general data	
scanning range Sd	100 1000 mm
scanning range far limit Sde	100 1000 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 50 ms
release time toff	< 50 ms
sonic frequency	240 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

#### connectors and mating connectors

ESG 32AH0200	Connector M8, 4 pin, straight, 2 m	
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		

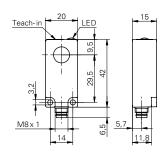
accessories

Accessories	
10150326	Sensofix series 10 / series 20
10153290	Sonic beam deflector series 20
for details: see accessories section	

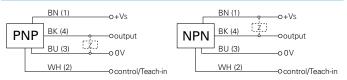
order reference	output circuit
UNDK 20N6903/S35A	NPN make function (NO)
UNDK 20N7903/S35A	NPN break function (NC)
UNDK 20P6903/S35A	PNP make function (NO)
UNDK 20P7803/S35A	PNP break function (NC)

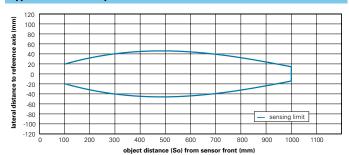


#### dimension drawing



#### connection diagrams





standard target with 30 x 30 mm, directed rectangular to sensor's reference axis



#### $Sd = 250 \, mm$

- potentiometer
- synchronization output
- small blind range

general data	
scanning range Sd	30 250 mm
scanning range far limit Sde	30 250 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
synchronization	yes
multiplex version	on request
temperature drift	< 0,18 % Sde/K
response time ton (sync on)	< 10 ms
release time toff (sync on)	< 10 ms
sonic frequency	300 kHz
adjustment	potentiometer
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
ambient conditions	
operating temperature	-25 +60 °C
protection class	IP 67

#### connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable cor	nnectors and field wireable connectors: see

#### accessories Accessories

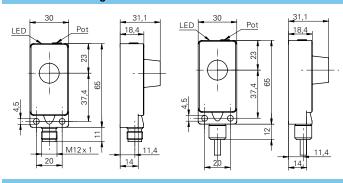
10152386	Sensofix series 30
for details: see a	ccessories section

connection types order reference output circuit **UNDK 30N1713** NPN make function (NO) cable, 2 m UNDK 30N1713/S14 NPN make function (NO) connector M12 UNDK 30N3713 NPN break function (NC) cable, 2 m UNDK 30N3713/S14 NPN break function (NC) connector M12 **UNDK 30P1713** PNP make function (NO) cable, 2 m UNDK 30P1713/S14 PNP make function (NO) connector M12 UNDK 30P3713 PNP break function (NC) cable, 2 m UNDK 30P3713/S14 PNP break function (NC) connector M12

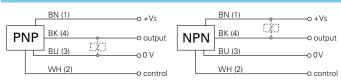


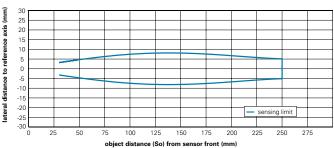


#### dimension drawings



#### connection diagrams





standard square target, size 15 x 15 mm, positioned perpendicularly to sensor's reference axis

#### Sd = 400 mm

- potentiometer
- synchronization output

general data	
scanning range Sd	60 400 mm
scanning range far limit Sde	60 400 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
synchronization	yes
multiplex version	on request
temperature drift	< 0,18 % Sde/K
response time ton (sync on)	< 25 ms
release time toff (sync on)	< 25 ms
sonic frequency	400 kHz
adjustment	potentiometer
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
ambient conditions	
operating temperature	-25 +60 °C
protection class	IP 67

#### connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m	
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		
accessories		

#### Accessories

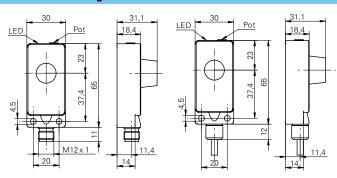
10152386	Sensofix series 30	
for details: see accessories section		

order reference	output circuit	connection types
UNDK 30N1712	NPN make function (NO)	cable, 2 m
UNDK 30N1712/S14	NPN make function (NO)	connector M12
UNDK 30N3712	NPN break function (NC)	cable, 2 m
UNDK 30N3712/S14	NPN break function (NC)	connector M12
UNDK 30P1712	PNP make function (NO)	cable, 2 m
UNDK 30P1712/S14	PNP make function (NO)	connector M12
UNDK 30P3712	PNP break function (NC)	cable, 2 m
UNDK 30P3712/S14	PNP break function (NC)	connector M12

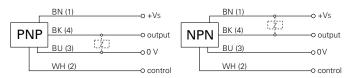


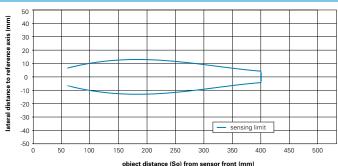


#### dimension drawings



#### connection diagrams





standard target with 30 x 30mm, directed rectangular to sensor's reference axis



#### Sd = 1000 mm

- potentiometer
- synchronization output
- temperature compensation

general data	
scanning range Sd	100 1000 mm
scanning range far limit Sde	100 1000 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
synchronization	yes
multiplex version	on request
temperature drift	< 0,1 % Sde/K
response time ton (sync on)	< 50 ms
release time toff (sync on)	< 50 ms
sonic frequency	240 kHz
adjustment	potentiometer
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
ambient conditions	
operating temperature	-10 +60 °C

#### connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable cor	nnectors and field wireable connectors: see

IP 67

additional cable connectors and field wireable connectors: see accessories

#### Accessories

protection class

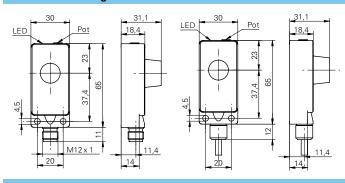
10152386 Sensofix series 30 for details: see accessories section

connection types order reference output circuit **UNDK 30N1703** NPN make function (NO) cable, 2 m UNDK 30N1703/S14 NPN make function (NO) connector M12 **UNDK 30N3703** NPN break function (NC) cable, 2 m UNDK 30N3703/S14 NPN break function (NC) connector M12 **UNDK 30P1703** PNP make function (NO) cable, 2 m UNDK 30P1703/S14 PNP make function (NO) connector M12 **UNDK 30P3703** PNP break function (NC) cable, 2 m UNDK 30P3703/S14 PNP break function (NC) connector M12

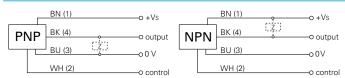


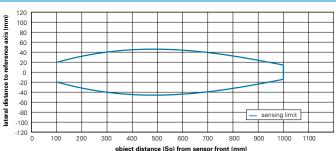


#### dimension drawings



#### connection diagrams





standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

#### Sd = 1000 mm

- external Teach-in
- Teach-in adapter
- small sonic beam angle

noneval data	
general data	100 1000 mm
scanning range Sd	
scanning range far limit Sde	100 1000 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 2 % Sde
power-up drift	compensated after 15 min.
response time ton	< 50 ms
release time toff	< 50 ms
sonic frequency	220 kHz
adjustment	qTeach
alignment aid	light indicator flashing
light indicator	LED yellow
power on indication	LED green
alignment measuring axis	< 2°
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption typ.	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 3,5 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	plastic (ASA, PMMA)
width / diameter	18 mm
height / length	45 mm
depth	32 mm
ambient conditions	
operating temperature	-25 +65 °C
storage temperature	-40 +75 °C
protection class	IP 67
1	

#### connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors; see	

additional cable connectors and field wireable connectors: see accessories

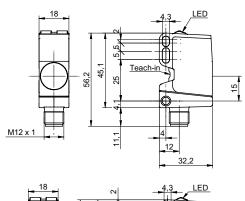
Accessories	
11099942	Sensofix O500/U500
11092246	Mounting bracket O500/U500 (L design)
11111164	Mounting bracket O500/U500 - Retrofit for sensors series 30
11111163	Sonic beam deflector for sensors U500
for details: see accessories section	

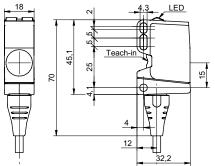
order reference	connection types
U500.PA0-11120936	cable PUR 4 x 0,25, 2 m
U500.PA0-11110577	connector M12



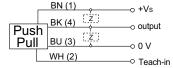


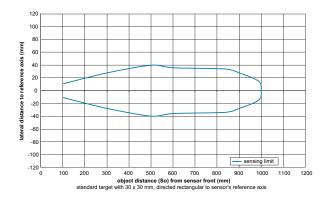
#### dimension drawings





#### connection diagram







#### Sd = 40 mm

- high speed sensors
- with beam columnator for measurement in very small containers

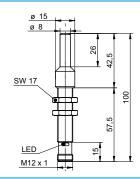
general data	
special type	Highspeed
scanning range Sd	0 40 mm
scanning range far limit Sde	0 40 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 1,3 ms
release time toff	< 1,3 ms
switching frequency	< 225 Hz
sonic frequency	380 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	100 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

connectors and mating connectors		
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m	
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		
accessories		

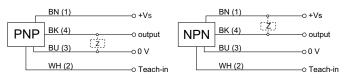
Accessories		
10151720	Sensofix series 12 round	
10141584	Teach-in Adapter M12	
for details: see accessories section		

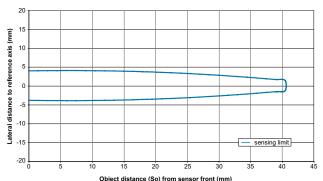


#### dimension drawing



#### connection diagrams





Object distance (So) from sensor front (mm)
Standard target with 15\*15 mm, directed rectangular to sensor's reference axis

order reference	output circuit
UNAM 12N8910/S14OD	NPN make function (NO) / break function (NC)
UNAM 12P8910/S14OD	PNP make function (NO) / break function (NC)



#### Sd = 70 mm

- with beam columnator for measurement in very small containers
- external Teach-in

general data	
scanning range Sd	5 70 mm
scanning range far limit Sde	5 70 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 10 ms
release time toff	< 10 ms
sonic frequency	380 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	100 mm
connection types	connector M12
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67

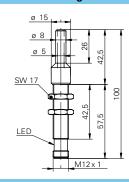
connectors and mating connectors		
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m	
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		

Accessories		
10151720	Sensofix series 12 round	
10141584	Teach-in Adapter M12	
for details: see accessories section		

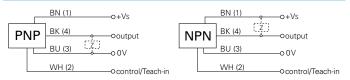
order reference	output circuit
UNAM 12N1914/S14D	NPN make function (NO)
UNAM 12P1914/S14D	PNP make function (NO)

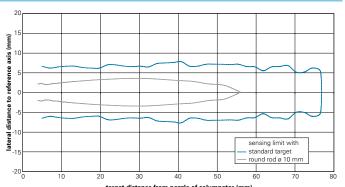


#### dimension drawing



#### connection diagrams





 $target \ distance \ from \ nozzle \ of \ columnator \ (mm)$  standard target 15 x 15 mm and round rod  $\emptyset$  10 mm, directed rectangular to sensor's reference axis



#### Sd = 70 mm

- high speed sensoren
- external Teach-in
- small sonic beam angle

peneral data special type Highspeed scanning range Sd 10 70 mm scanning range far limit Sde 30 70 mm systeresis typ. 4 % Sde sepeat accuracy < 0,5 mm semperature drift < 0,18 % Sde/K sesponse time ton < 1,3 ms selease time toff < 1,3 ms switching frequency < 225 Hz sonic frequency 380 kHz sidjustment external Teach-in
icanning range Sd 10 70 mm icanning range far limit Sde 30 70 mm inysteresis typ. 4 % Sde epeat accuracy < 0,5 mm emperature drift < 0,18 % Sde/K esponse time ton < 1,3 ms elease time toff < 1,3 ms ewitching frequency < 225 Hz iconic frequency 380 kHz
conning range far limit Sde 30 70 mm  dysteresis typ. 4 % Sde epeat accuracy < 0,5 mm emperature drift < 0,18 % Sde/K esponse time ton < 1,3 ms elease time toff < 1,3 ms ewitching frequency < 225 Hz conic frequency 380 kHz
anysteresis typ.       4 % Sde         eepeat accuracy       < 0,5 mm
epeat accuracy < 0,5 mm emperature drift < 0,18 % Sde/K esponse time ton < 1,3 ms elease time toff < 1,3 ms ewitching frequency < 225 Hz conic frequency 380 kHz
emperature drift < 0,18 % Sde/K esponse time ton < 1,3 ms elease time toff < 1,3 ms switching frequency < 225 Hz conic frequency 380 kHz
esponse time ton < 1,3 ms elease time toff < 1,3 ms ewitching frequency < 225 Hz eonic frequency 380 kHz
elease time toff < 1,3 ms witching frequency < 225 Hz conic frequency 380 kHz
switching frequency < 225 Hz sonic frequency 380 kHz
conic frequency 380 kHz
diustment external Teach-in
ajacament Oxforma rodon in
lignment aid target indication flashing
output indicator LED green
electrical data
roltage supply range +Vs 12 30 VDC
current consumption max. (no 35 mA coad)
output current < 200 mA
roltage drop Vd < 2 VDC
esidual ripple < 10 % Vs
hort circuit protection yes
everse polarity protection yes
nechanical data
ype cylindrical threaded
nousing material brass nickel plated
vidth / diameter 12 mm
neight / length 70 mm
connection types connector M12
imbient conditions
pperating temperature -10 +60 °C
protection class IP 67

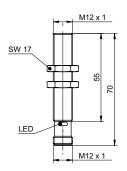
#### connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable con	nnectors and field wireable connectors: see
accorriac	

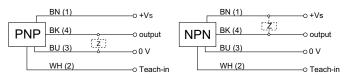
accessories		
Accessories		
10151720	Sensofix series 12 round	
10141584 Teach-in Adapter M12		
for details: see accessories section		

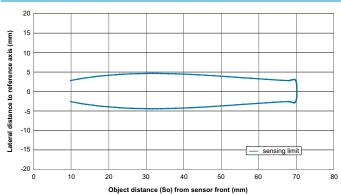


#### dimension drawing



#### connection diagrams





Standard target with 15\*15 mm, directed rectangular to sensor's reference axis

order reference	output circuit
UNAM 12N8910/S14O	NPN make function (NO) / break function (NC)
UNAM 12P8910/S14O	PNP make function (NO) / break function (NC)

#### Sd = 200 mm

- external Teach-in
- Teach-in adapter
- small sonic beam angle

general data	
scanning range Sd	10 200 mm
scanning range far limit Sde	30 200 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 10 ms
release time toff	< 10 ms
sonic frequency	380 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	70 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

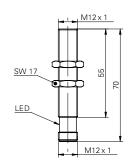
connectors and mating connectors		
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m	
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see accessories		

Accessories		
10151720	Sensofix series 12 round	
10141584	Teach-in Adapter M12	
for details: see accessories section		

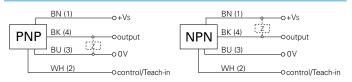
order reference	output circuit
UNAM 12N1914/S14	NPN make function (NO)
UNAM 12N3914/S14	NPN break function (NC)
UNAM 12P1914/S14	PNP make function (NO)
UNAM 12P3914/S14	PNP break function (NC)



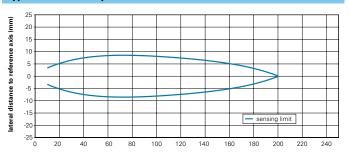
#### dimension drawing



#### connection diagrams



#### typical sonic cone profile



standard square target, size  $15 \times 15 \text{ mm}$ , positioned perpendicularly to sensor's reference axis



#### Sd = 400 mm

- external Teach-in
- Teach-in adapter
- wide sonic beam angle

general data	
scanning range Sd	40 400 mm
scanning range far limit Sde	60 400 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 25 ms
release time toff	< 25 ms
sonic frequency	290 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	70 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67
	-

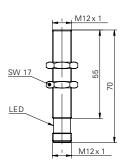
connectors and mating connectors		
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m	
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		
accessories		

Accessories	
10151720	Sensofix series 12 round
10141584	Teach-in Adapter M12
for details: see accessories section	

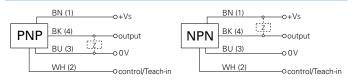
order reference	output circuit
UNAM 12N1912/S14	NPN make function (NO)
UNAM 12N3912/S14	NPN break function (NC)
UNAM 12P1912/S14	PNP make function (NO)
UNAM 12P3912/S14	PNP break function (NC)

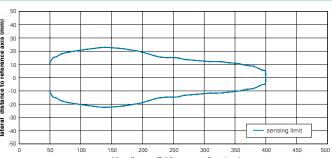


#### dimension drawing



#### connection diagrams





object distance (So) from sensor front (mm) standard target with 30 x 30mm, directed rectangular to sensor's reference axis



#### Sd = 700 mm

- potentiometer
- synchronization output

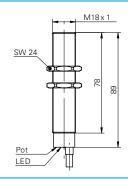
namenal data	
general data	100 700
scanning range Sd	100 700 mm
scanning range far limit Sde	110 700 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
synchronization	yes
temperature drift	< 0,18 % Sde/K
response time ton (sync on)	< 50 ms
release time toff (sync on)	< 50 ms
sonic frequency	240 kHz
adjustment	potentiometer
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	30 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	18 mm
height / length	89 mm
connection types	cable, 2 m
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67
· · · · · · · · · · · · · · · · · · ·	

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18
10164264	Sonic beam deflector series 18 rectangular
for details: see accessories section	

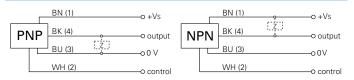
order reference	output circuit
UNAM 18N1703	NPN make function (NO)
UNAM 18N3703	NPN break function (NC)
UNAM 18P1703	PNP make function (NO)
UNAM 18P3703	PNP break function (NC)



#### dimension drawing

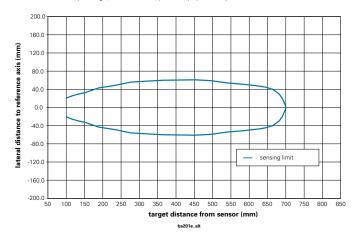


#### connection diagrams



#### typical sonic cone profile

typical sonic cone profile of ultrasonic sensors with sensing range 100...700 mm standard square target, size  $30 \times 30$  mm, positioned perpendicularly to sensor's reference axis





#### Sd = 1000 mm

• internal and external Teach-in

general data	
scanning range Sd	100 1000 mm
scanning range far limit Sde	100 1000 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 50 ms
release time toff	< 50 ms
sonic frequency	240 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	18 mm
height / length	90 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

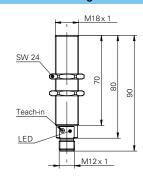
connectors and mating connectors		
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m	
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see accessories		

40003301103	
Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18
10164264	Sonic beam deflector series 18 rectangular
for details: see accessorie	es section

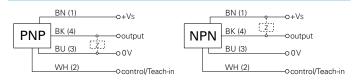
order reference	output circuit
UNAM 18N6903/S14	NPN make function (NO)
UNAM 18P6903/S14	PNP make function (NO)
UNAM 18P7903/S14	PNP break function (NC)

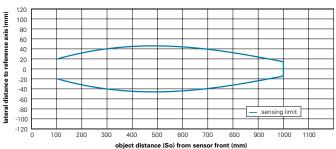


#### dimension drawing



#### connection diagrams





standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

#### Sd = 1000 mm

- external Teach-in
- Teach-in adapter
- small sonic beam angle

general data	
scanning range Sd	100 1000 mm
scanning range Su	100 1000 mm
	4 % Sde
hysteresis typ.	
repeat accuracy	< 0,5 mm < 2 % Sde
temperature drift	
power-up drift	compensated after 10 min.
response time ton	< 50 ms
release time toff	< 50 ms
sonic frequency	220 kHz
adjustment	qTeach
alignment aid	light indicator flashing
light indicator	LED yellow
power on indication	LED green
alignment measuring axis	< 2°
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption typ.	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 3,5 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated / TR90
width / diameter	18 mm
height / length	64 mm
connection types	connector M12
ambient conditions	
operating temperature	-25 +70 °C
storage temperature	-40 +85 °C
protection class	IP 67
connectors and mating connect	ors

# ESW 33AH0200 Connector M12, 4 pin, angular, 2 m additional cable connectors and field wireable connectors: see accessories Accessories 10151658 Sensofix series 18

Connector M12, 4 pin, straight, 2 m

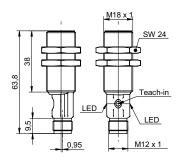
Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18
10164264	Sonic beam deflector series 18 rectangular
for details: see accessories section	

## order reference UR18.PA0-11120038

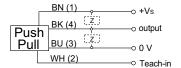
ESG 34AH0200

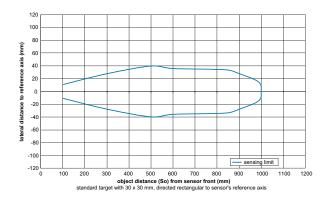


#### dimension drawing



#### connection diagram







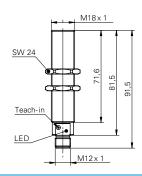
#### Sd = 400 mm

- internal and external Teach-in
- sensorfront chemically resistant
- stainless steel housing

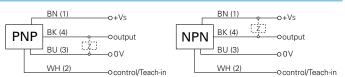
general data	
special type	chemically resistant
scanning range Sd	60 400 mm
scanning range far limit Sde	60 400 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 25 ms
release time toff	< 25 ms
sonic frequency	400 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	stainless steel 1.4435 (V4A)
coating active face	Parylene
material O-ring	FFKM
front of sensor durable against pressure	6 bar, 20'000 cycle
width / diameter	18 mm
height / length	91,5 mm
connection types	connector M12
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67
connectors and mating connector	ors
ESG 34AH0200 Connector M1	2, 4 pin, straight, 2 m
ESW 33AH0200 Connector M12, 4 pin, angular, 2 m	
CONTROLOG CONTROLOGICALINA	
additional cable connectors and fie accessories	ld wireable connectors: see
additional cable connectors and fie	ld wireable connectors: see
additional cable connectors and fie accessories  Accessories	ld wireable connectors: see
additional cable connectors and fie accessories  Accessories  10151658 Sensofi	
additional cable connectors and fie accessories  Accessories  10151658 Sensofi:  ZADAP-M18.STANDARD Mounting	x series 18



#### dimension drawing



#### connection diagrams



#### typical sonic cone profile distance to reference axis (mm) 30 10 0 -10 -20 -30 250 300 400

object distance (So) from sensor front (mm)

order reference	output circuit
UNAR 18N6912/S14G	NPN make function (NO)
UNAR 18N7912/S14G	NPN break function (NC)
UNAR 18P6912/S14G	PNP make function (NO)
UNAR 18P7912/S14G	PNP break function (NC)

**40** 

ZADAP-M18.SWING

for details: see accessories section

10164264

Sonic beam deflector series 18 rectangular

Mounting bracket for adjustment for

sensors series 18



#### Sd = 1000 mm

- internal and external Teach-in
- sensorfront chemically resistant
- stainless steel housing

ganaval data	
general data	
special type	chemically resistant
scanning range Sd	100 1000 mm
scanning range far limit Sde	100 1000 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 50 ms
release time toff	< 50 ms
sonic frequency	240 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	stainless steel 1.4435 (V4A)
coating active face	Parylene
material O-ring	FFKM
front of sensor durable against pressure	6 bar, 20'000 cycle
width / diameter	18 mm
height / length	91,5 mm
connection types	connector M12
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67

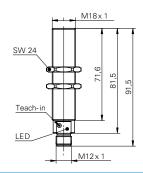
## connectors and mating connectors ESG 34AH0200 Connector M12, 4 pin, straight, 2 m ESW 33AH0200 Connector M12, 4 pin, angular, 2 m additional cable connectors and field wireable connectors: see

accessories

40003301103	
Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18
10164264	Sonic beam deflector series 18 rectangular
for details: see accessorie	es section

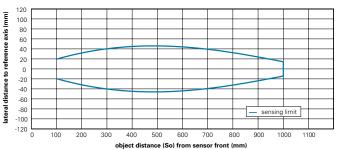


#### dimension drawing



#### connection diagrams





standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

order reference	output circuit
UNAR 18N6903/S14G	NPN make function (NO)
UNAR 18N7903/S14G	NPN break function (NC)
UNAR 18P6903/S14G	PNP make function (NO)
UNAR 18P7903/S14G	PNP break function (NC)



#### Sd = 1500 mm

- potentiometer
- increased sensing range

general data	
scanning range Sd	200 1500 mm
scanning range far limit Sde	200 1500 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 1 mm
temperature drift	< 0,18 % Sde/K
response time ton	< 100 ms
release time toff	< 100 ms
sonic frequency	200 kHz
adjustment	potentiometer
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	30 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	30 mm
height / length	70 mm
ambient conditions	
operating temperature	-25 +60 °C
protection class	IP 67

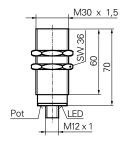
connectors and mating connectors		
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m	
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		
accessories		

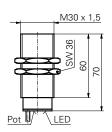
order reference	output circuit	connection types
UNAM 30N1104	NPN make function (NO)	cable, 2 m
UNAM 30N1104/S14	NPN make function (NO)	connector M12
UNAM 30N3104	NPN break function (NC)	cable, 2 m
UNAM 30N3104/S14	NPN break function (NC)	connector M12
UNAM 30P1104	PNP make function (NO) cable, 2 m	
UNAM 30P1104/S14	PNP make function (NO)	connector M12
UNAM 30P3104	PNP break function (NC)	cable, 2 m
UNAM 30P3104/S14	PNP break function (NC)	connector M12



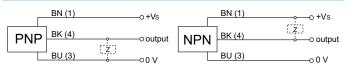


#### dimension drawings



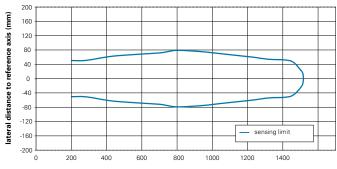


#### connection diagrams



#### typical sonic cone profile

typical sonic beam of ultrasonic sensors with sensing range 200...1500 mm standard target 100 x 100 mm, positioned perpendicularly to sensor's reference axis and the contract of the contrac





#### Sd = 2500 mm

- potentiometer
- synchronization output
- long sensing range

general data	
scanning range Sd	350 2500 mm
scanning range far limit Sde	350 2500 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 1 mm
synchronization	yes
temperature drift	< 0,18 % Sde/K
response time ton	< 160 ms
release time toff	< 160 ms
sonic frequency	120 kHz
adjustment	potentiometer
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	30 mm
height / length	95 mm
ambient conditions	
operating temperature	-25 +60 °C
protection class	IP 67

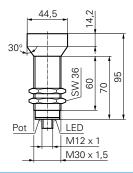
connectors and mating connectors		
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m	
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		
accessories		

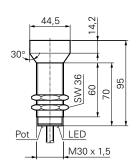
order reference	output circuit	connection types
UNAM 50N1721	NPN make function (NO)	cable, 2 m
UNAM 50N1721/S14	NPN make function (NO)	connector M12
UNAM 50N3721	NPN break function (NC)	cable, 2 m
UNAM 50N3721/S14	NPN break function (NC)	connector M12
UNAM 50P1721	PNP make function (NO)	cable, 2 m
UNAM 50P1721/S14	PNP make function (NO)	connector M12
UNAM 50P3721	PNP break function (NC)	cable, 2 m
UNAM 50P3721/S14	PNP break function (NC)	connector M12



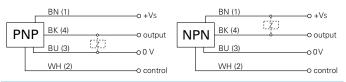


#### dimension drawings



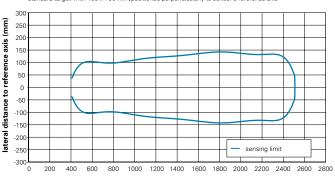


#### connection diagrams



#### typical sonic cone profile

typical sonic beam of ultrasonic sensors with sensing range 400...2500 mm standard target with 100 x 100 mm, positioned perpendicularly to sensor's reference axis



object distance (So) from sensor front (mm)





## 2 point proximity switches

IntroductionPage 46OverviewPage 47Rectangular designsPage 48Cylindrical designsPage 52

www.baumer.com 4



#### The button that thinks



Ultrasonic sensors with the "Teach-in" function are similar to the standard range of products but have the added versatility of a simple touch key set up. The switching points (Sde 1 and Sde 2) may be easily programmed within the sensing range by means of the built-in Teach-in button.

#### Simple operation

#### Adjustment switching point Sde 1

1. Adjustment mode:

Press the Teach-in button for approximately 2 secs until the LED flashes green. Release button.

- 2.LED flashes green. Place the target at the required scanning range and press the Teach-in button.
- Successful completion of Teach-in procedure is confirmed by LED "on" for approximately 2 secs.

#### Adjustment switching point Sde 2

1. Adjustment mode:

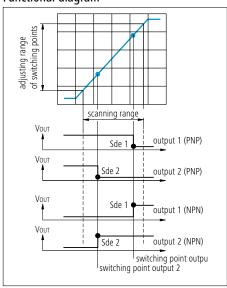
Press the Teach-in button for approximately 4 secs until the LED flashes yellow. Release button.

- 2.LED flashes yellow. Place the target at the required scanning range and press the Teach-in button.
- Successful completion of Teach-in procedure is confirmed by LED "on" for approximately 2 secs.

#### Resetting to original factory settings

Holding the button down for > 6 secs, will automatically restore the original factory setting. Fast flashing of the green/yellow LED indicates successful completion of the resetting.

#### Functional diagram



#### **Options**

- · Remote Teach-in input
- Synchronization- / Multiplex output

#### Advantages

- Set up configuration is saved on an internal EEPROM ensuring long term stability.
- Simple one button set up, no tools required.
- Teach-in lock: the Teach-in function is locked five minutes after power up or five minutes after the end of the last Teach-in process.

46 www.baumer.com



## rectangular designs

product family	UZDK 30	UZDK 30	UZDK 30	UZDK 30
		F		
width / diameter	30 mm	30 mm	30 mm	30 mm
scanning range Sd	30 250 mm	60 400 mm	100 1000 mm	200 2000 mm
Teach-in		•	-	-
repeat accuracy	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 1 mm
operating temperature	-10 +60 °C	-10 +60 °C	-10 +60 °C	-10 +60 °C
housing material	polyester / die-cast zinc	polyester/ die-cast zinc	polyester / die-cast zinc	polyester / die-cast zinc
cable, 2 m			-	=
connector M12				
protection class	IP 67	IP 67	IP 67	IP 67
page	48	49	50	51

## cylindrical designs

product family	UZAM 30	UZAM 50	UZAM 70
			H
width / diameter	30 mm	30 mm	30 mm
scanning range Sd	100 1000 mm	350 2500 mm	600 6000 mm
Teach-in	-		
repeat accuracy	< 0,5 mm	< 1 mm	< 3 mm
operating temperature	-10 +60 °C	-10 +60 °C	-25 +60 °C
housing material	brass nickel plated	brass nickel plated	brass nickel plated
cable, 2 m	-		
connector M12	•		
protection class	IP 67	IP 67	IP 67
page	52	53	54



## Sd = 250 mm

- Teach-in
- small blind range
- two separate outputs

general data	
special type	2 point proximity switch
scanning range Sd	30 250 mm
scanning range far limit Sde	30 250 mm
hysteresis typ.	5 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 2 % Sde
response time ton	< 20 ms
release time toff	< 20 ms
sonic frequency	300 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green / yellow LED
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	40 mA
output circuit	PNP make function (NO)
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

#### connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable co	nnectors and field wireable connectors: see
accessories	

#### Accessories

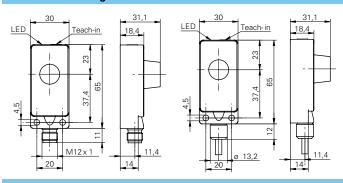
10152386	Sensofix series 30
for details: see accessories section	

order reference	connection types
UZDK 30P6113	cable, 2 m
UZDK 30P6113/S14	connector M12

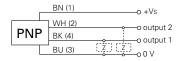


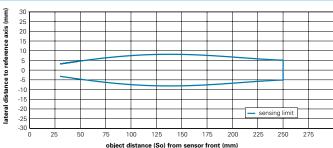


#### dimension drawings



#### connection diagram





standard square target, size 15 x 15 mm, positioned perpendicularly to sensor's reference axis

#### Sd = 400 mm

- Teach-in
- two separate outputs

general data	
special type	2 point proximity switch
scanning range Sd	60 400 mm
scanning range far limit Sde	60 400 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 0,5 mm
temperature drift	< 2 % Sde
response time ton	< 30 ms
release time toff	< 30 ms
sonic frequency	400 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green / yellow LED
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	40 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

#### connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
	nnectors and field wireable connectors: see
accessories	

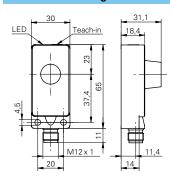
#### Accessories

	10152386	Sensofix series 30			
for details: see accessories section					

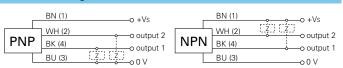
order reference	output circuit	
UZDK 30N6112/S14	NPN make function (NO)	
UZDK 30P6112/S14	PNP make function (NO)	

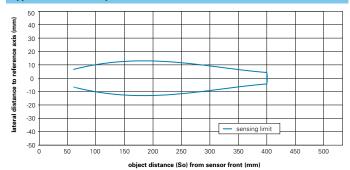


#### dimension drawing



#### connection diagrams





standard target with 30 x 30mm, directed rectangular to sensor's reference axis

## Sd = 1000 mm

- Teach-in
- two separate outputs

general data			
special type	2 point proximity switch		
scanning range Sd	100 1000 mm		
scanning range far limit Sde	100 1000 mm		
hysteresis typ.	4 % Sde		
repeat accuracy	< 0,5 mm		
temperature drift	< 2 % Sde		
response time ton	< 40 ms		
release time toff	< 40 ms		
sonic frequency	240 kHz		
adjustment	Teach-in		
alignment aid	target indication flashing		
output indicator	green / yellow LED		
electrical data			
voltage supply range +Vs	12 30 VDC		
current consumption max. (no load)	40 mA		
output circuit	PNP make function (NO)		
output current	< 200 mA		
voltage drop Vd	< 2 VDC		
residual ripple	< 10 % Vs		
short circuit protection	yes		
reverse polarity protection	yes		
mechanical data			
type	rectangular		
housing material	polyester / die-cast zinc		
width / diameter	30 mm		
height / length	65 mm		
depth	31 mm		
ambient conditions			
operating temperature	-10 +60 °C		
protection class	IP 67		

#### connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable cor	nnectors and field wireable connectors: see
accessories	

#### Accessories

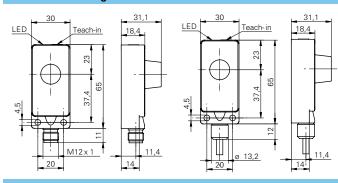
10152386	Sensofix series 30	
for details: see accessories section		

order reference	connection types	
UZDK 30P6103	cable, 2 m	
UZDK 30P6103/S14	connector M12	

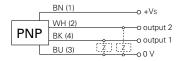


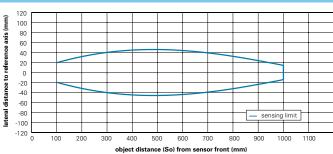


#### dimension drawings



#### connection diagram





standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

## Sd = 2000 mm

- Teach-in
- two separate outputs

general data			
special type	2 point proximity switch		
scanning range Sd	200 2000 mm		
scanning range far limit Sde	200 2000 mm		
hysteresis typ.	4 % Sde		
repeat accuracy	< 1 mm		
temperature drift	< 2 % Sde		
response time ton	< 80 ms		
release time toff	< 80 ms		
sonic frequency	200 kHz		
adjustment	Teach-in		
alignment aid	target indication flashing		
output indicator	green / yellow LED		
electrical data			
voltage supply range +Vs	12 30 VDC		
current consumption max. (no load)	40 mA		
output circuit	PNP make function (NO)		
output current	< 200 mA		
voltage drop Vd	< 2 VDC		
residual ripple	< 10 % Vs		
short circuit protection	yes		
reverse polarity protection	yes		
mechanical data			
type	rectangular		
housing material	polyester / die-cast zinc		
width / diameter	30 mm		
height / length	65 mm		
depth	31 mm		
ambient conditions			
operating temperature	-10 +60 °C		
protection class	IP 67		

## connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable co	nnectors and field wireable connectors: see

additional cable connectors and field wireable connectors: see accessories

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Α	v	u	c	3	Э	v	ш	ш	c	ь

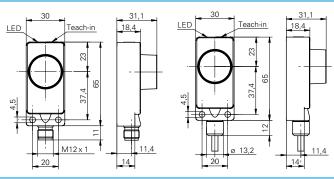
10152386	Sensofix series 30		
for details: see accessories section			

order reference	connection types		
UZDK 30P6104	cable, 2 m		
UZDK 30P6104/S14	connector M12		



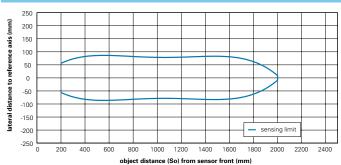


#### dimension drawings



#### connection diagram





standard target with 100 x 100 mm, positioned perpendicularly to sensor's reference axis



#### Sd = 1000 mm

- Teach-in
- two separate outputs
- Multiplex-Function

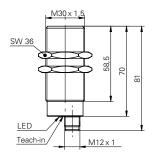
general data				
special type	2 point proximity switch			
scanning range Sd	100 1000 mm			
scanning range far limit Sde	100 1000 mm			
hysteresis typ.	4 % Sde			
repeat accuracy	< 0,5 mm			
temperature drift	< 2 % Sde			
response time ton	< 40 ms			
release time toff	< 40 ms			
sonic frequency	240 kHz			
adjustment	Teach-in			
alignment aid	target indication flashing			
output indicator	green / yellow LED			
electrical data				
voltage supply range +Vs	12 30 VDC			
current consumption max. (no load)	35 mA			
output current	< 200 mA			
voltage drop Vd	< 2 VDC			
residual ripple	< 10 % Vs			
short circuit protection	yes			
reverse polarity protection	yes			
mechanical data				
type	cylindrical threaded			
housing material	brass nickel plated			
width / diameter	30 mm			
height / length	70 mm			
ambient conditions				
operating temperature	-10 +60 °C			
protection class	IP 67			

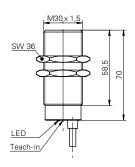
connectors and mating connectors				
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m			
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m			
ESG 34CH0200	Connector M12, 5 pin, straight, 2 m			
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m			
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m			
additional cable cor	nnectors and field wireable connectors: see			



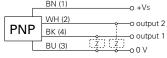


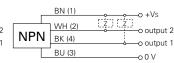
#### dimension drawings



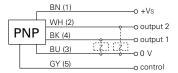


#### connection diagrams

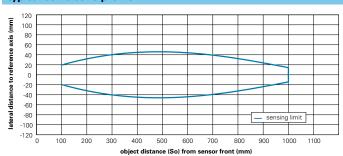




#### connection diagram multiplex version



#### typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

order reference	version	output circuit	connection types
UZAM 30N6103/S14	standard	NPN make function (NO)	connector M12
UZAM 30P6103	standard	PNP make function (NO)	cable, 2 m
UZAM 30P6103/S14	standard	PNP make function (NO)	connector M12
UZAM 30P6803/S14C	multiplex version	PNP make function (NO)	connector M12

**52** www.baumer.com



## Sd = 2500 mm

- Teach-in
- two separate outputs
- long sensing range

general data	
special type	2 point proximity switch
scanning range Sd	350 2500 mm
scanning range far limit Sde	350 2500 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 1 mm
temperature drift	< 2 % Sde
response time ton	< 160 ms
release time toff	< 160 ms
sonic frequency	120 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green / yellow LED
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	40 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	30 mm
height / length	95 mm
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

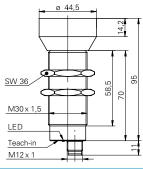
connectors and mating connectors		
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m	
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		

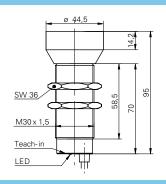
order reference	output circuit	connection types
UZAM 50N6121	NPN make function (NO)	cable, 2 m
UZAM 50N6121/S14	NPN make function (NO)	connector M12
UZAM 50P6121	PNP make function (NO)	cable, 2 m
UZAM 50P6121/S14	PNP make function (NO)	connector M12





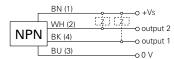
#### dimension drawings



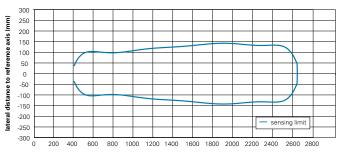


#### connection diagrams





#### typical sonic cone profile



 $\label{eq:continuous} \textbf{object distance (So) from sensor front (mm)} \\ \text{standard target with } 100 \, \text{x} \, 100 \, \text{mm}, \\ \text{positioned perpendicularly to sensor's reference axis} \\$ 

#### Sd = 6000 mm

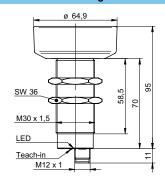
- Teach-in
- two separate outputs
- long sensing range

general data	
special type	2 point proximity switch
scanning range Sd	600 6000 mm
scanning range far limit Sde	600 6000 mm
hysteresis typ.	4 % Sde
repeat accuracy	< 3 mm
temperature drift	< 2 % Sde
response time ton	< 240 ms
release time toff	< 240 ms
sonic frequency	80 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green / yellow LED
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	40 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	30 mm
height / length	95 mm
connection types	connector M12
ambient conditions	
operating temperature	-25 +60 °C
protection class	IP 67

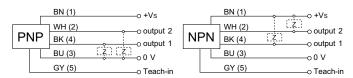
# Connectors and mating connectors ESG 34CH0200 Connector M12, 5 pin, straight, 2 m ESW 33CH0200 Connector M12, 5 pin, angular, 2 m ESW 33CH0500 Connector M12, 5 pin, angular, 5 m additional cable connectors and field wireable connectors: see accessories

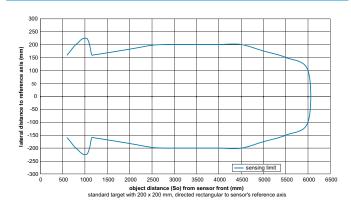


#### dimension drawing

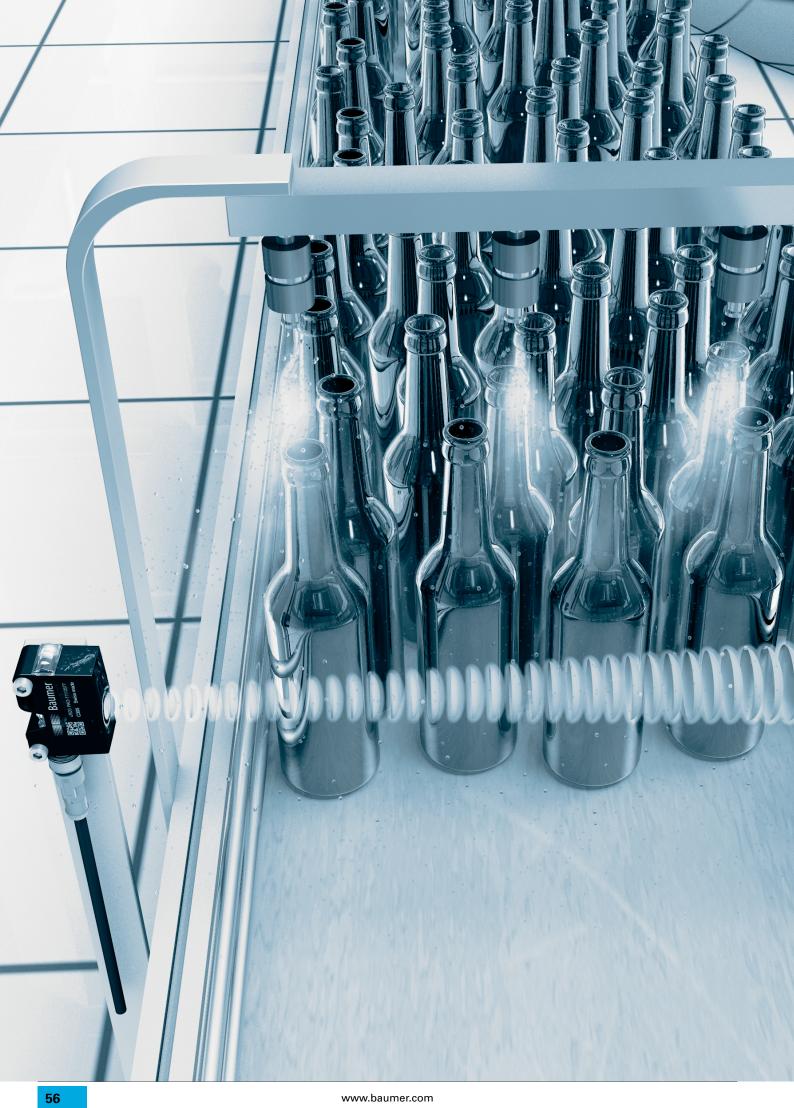


#### connection diagrams





order reference	output circuit
UZAM 70N8131/S14C	NPN make function (NO) / break function (NC)
UZAM 70P8131/S14C	PNP make function (NO) / break function (NC)





## Retro-reflective sensors

IntroductionPage 58OverviewPage 60Rectangural designsPage 62Cylindrical designsPage 72

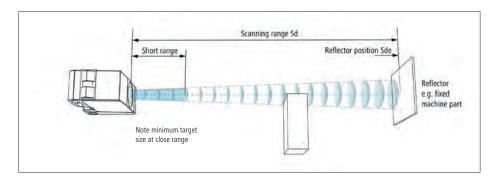
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#### Description

The retro-reflective ultrasonic sensor is similar in operation to the ultrasonic proximity sensor. The distance from the sensor to the reflector or to an object within the sensing distance is determined by measuring the propagation time. Any sound reflecting, stationary object can be used as a reflector. The sensing distance Sd (distance sensor-reflector) can be adjusted to the set up conditions with the sensor's potentiometer.

As long as the measured propagation time of the ultrasonic signal corresponds to the distance from the sensor to the reflector, the device is in the non-active state. When an object comes within the sensing distance, the propagation time changes and the sensor changes to the active state. This also allows detection of sound absorbent and sound deflecting objects.



#### Setting Sde reflector distance

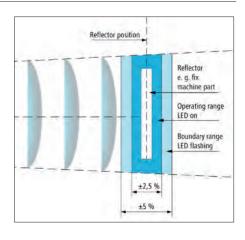
The sensor's potentiometer allows the user to adjust the set up conditions for a specific reflector position (Sde). The output LED is also an adjustment aid as follows:

1. Reflector in operating range
If the setting of Sde deviates from the actual
reflector position by less than

±2,5 %, the reflector is in the operating range. The LED lights steadily, the output is inactive.

#### 2. Reflector in the boundary range

Up to a deviation of  $\pm 5$  % the output remains inactive but the LED flashes. This indicates that the setting of Sde is not optimal and needs to be corrected.



#### Retro-reflective sensor with Teach-in

All adjustments are made using the single built-in Teach-in button.

#### Teach-in of reflector's position

To enter the adjustment mode, push the Teach-in button for more than two seconds. You will know you have pushed it long enough by the indicating LED flashing green. When the button is released, the LED continues to flash. Any subsequent push of the button will teach the position of the reflector.

#### Resetting to original factory settings

Connecting the white Teach-in wire to +Vs for > 6 sec, will automatically restore the original factory settings. Fast flashing of the LED indicates successful completion of the resetting.

qTeach™

With  $qTeach^{TM}$  we are introducing a new, convenient and wear-free teach procedure. Teaching of O500 sensors is just by a touch with any ferromagnetic tool. A blue LED light provides clear optical feedback. To prevent user errors,  $qTeach^{TM}$  locks autonomously after 5 minutes.

58 www.baumer.com



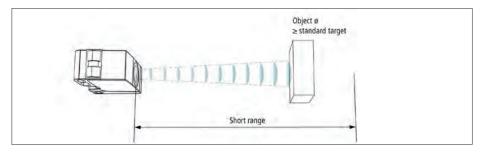
## **Object detection**

#### Standard object/reflector

The standard target is defined as a square, level object with an edge length of 30 mm (Sde > 1000 mm: 100 mm edge length, Sde  $\ge$  2500 mm: 300 mm edge length) which is perpendicular to the sensor reference axis. The reflector must be made of a material with good sound reflection properties and be at least the same size as the target.

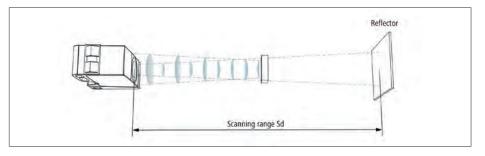
#### Object at close range

For reliable detection, the sound cone must be covered completely so that no echo is returned from the reflector. The object diameter necessary for this is at least 30 mm in URDK 30 and at least 100 mm in URAM 50



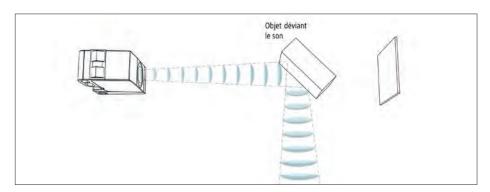
#### Object in the rest of the operating range

To ensure reliable object detection, the reflected signal must be strong enough. The strength of the reflected signal is dependent on the size of the object. For a standard object, or larger, the full sensing distance Sd is available.



#### **Advantages**

- Easy detection even for 100 % sound absorbent materials
- Reliable detection of sound deflecting objects
- No blind region in front of the sensor for objects ≥ standard object





## rectangular designs

product family	URCK 09	URDK 09	URDK 10	URDK 20	URDK 20	URDK 20	URDK 30	
		0		I	I	Ü	F	
	Miniature	Miniature	Miniature	Standard	Standard	Standard	Standard	
width / diameter	8,6 mm	8,6 mm	10,4 mm	20 mm	20 mm	20 mm	30 mm	
scanning range Sd	0 200 mm	0 200 mm	0 200 mm	0 200 mm	0 400 mm	0 1000 mm	0 1000 mm	
potentiometer							•	
Teach-in	•	•				•		
qTeach								
repeat accuracy	< 1,5 mm	< 1,5 mm	< 1,5 mm	< 1,5 mm	< 1,5 mm	< 1,5 mm	< 3 mm	
operating temperature	0 +60 °C	0 +60 °C	-10 +60 °C	-10 +60 °C	-10 +60 °C	-10 +60 °C	-10 +60 °C	
housing material	PA 12	PA 12	plastic (ASA)	polyester	polyester	polyester	polyester/ die-cast zinc	
cable PUR 4 x 0,25, 2 m								
cable, 2 m	•	•						
flylead connector M8, L=200 mm	•	•	•					
connector M8			•		•	•		
connector M12							•	
protection class	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	
page	62	63	64	66	67	68	69	

## cylindrical designs

product family	URAM 12	URAM 12	URAR 18	UR18.RA0	URAM 50
		II.			
special type	High-speed	High-speed	Robust	Standard	Large sensing distance
width / diameter	12 mm	12 mm	18 mm	18 mm	30 mm
scanning range Sd	0 40 mm	0 70 mm	0 400 mm	0 1000 mm	0 3000 mm
potentiometer					•
external Teach-in		•			
Teach-in			•		•
qTeach				•	
repeat accuracy	< 1,5 mm	< 1,5 mm	< 1,5 mm	< 3 mm	< 3 mm
operating temperature	-10 +60 °C	-10 +60 °C	0 +60 °C	-25 +70 °C	-10 +60 °C
housing material	brass nickel plated	brass nickel plated	stainless steel 1.4435 (V4A)	brass nickel plated / TR90	brass nickel plated
cable, 2 m					-
connector M12	•	•	•	•	•
protection class	IP 67	IP 67	IP 67	IP 67	IP 67
page	73	74	75	77	78

60 www.baumer.com

LIEGO DAG	LIDDI/ 00
U500.RA0	URDK 30
Extra performance	Standard
18 mm	30 mm
0 1000 mm	0 2000 mm
•	
< 3 mm	< 3 mm
-25 +65 °C	-10 +60 °C
plastic (ASA, PMMA)	polyester / die-cast zinc
•	
•	•
IP 67	IP 67
70	72



#### Sd = 200 mm

- detects sound absorbing objects
- long sensing range / no blind range
- short response time

general data	
scanning range Sd	0 200 mm
reflector position Sde	60 200 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 7 ms
release time toff	< 7 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green LED / red LED
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	55 mm
depth	24,5 mm
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67

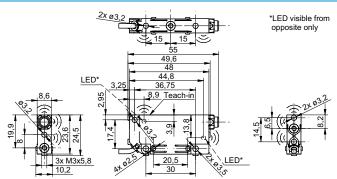
#### connectors and mating connectors

ESG 32AH0200	Connector M8, 4 pin, straight, 2 m	
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see accessories		

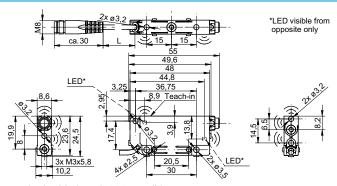
order reference	connection types
URCK 09G8914	cable, 2 m
URCK 09G8914/KS35A	flylead connector M8, L=200 mm



#### dimension drawing

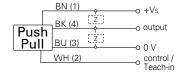


#### flylead connector version

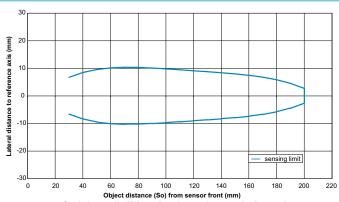


standard cable length 200 mm (L)

#### connection diagram



#### typical sonic cone profile



Standard target with 15\*15 mm, directed rectangular to sensor's reference axis

**URDK** 09

#### Sd = 200 mm

- detects sound absorbing objects
- long sensing range / no blind range
- short response time

general data	
scanning range Sd	0 200 mm
reflector position Sde	60 200 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 7 ms
release time toff	< 7 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	green LED / red LED
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	48,8 mm
depth	30,5 mm
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67

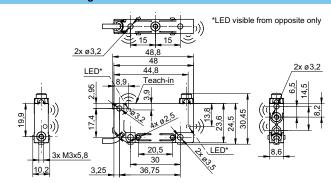
#### connectors and mating connectors

ESG 32AH0200	Connector M8, 4 pin, straight, 2 m	
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		

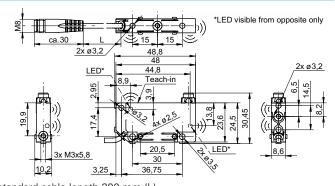
order reference	connection types
URDK 09G8914	cable, 2 m
URDK 09G8914/KS35A	flylead connector M8, L=200 mm



#### dimension drawing

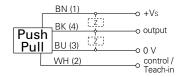


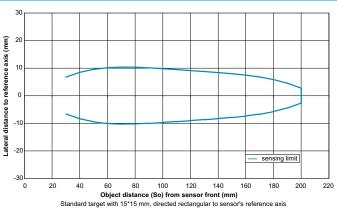
#### flylead connector version



standard cable length 200 mm (L)

#### connection diagram







#### Sd = 200 mm

- small housing dimensions
- very low mass (4 g)
- long sensing range / no blind range

general data	
scanning range Sd	0 200 mm
reflector position Sde	40 200 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 15 ms
release time toff	< 15 ms
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	30 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	plastic (ASA)
width / diameter	10,4 mm
height / length	27 mm
depth	14 mm
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

#### connectors and mating connectors

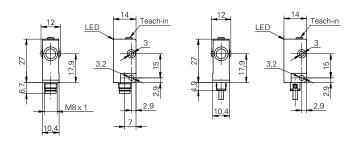
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories	

accessories	
Accessories	
10150326	Sensofix series 10 / series 20
10133792	Mounting bracket series 10 (L design)
10114501	Mounting bracket series 10 (U design)
10162083	Mounting panel for sensors series 10
10118798	Mounting bracket series 10
10162376	Sonic beam deflector for ultrasonic sensors series
	10
for details: see accessories section	

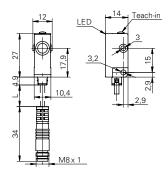




#### dimension drawings

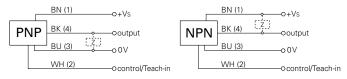


#### flylead connector version

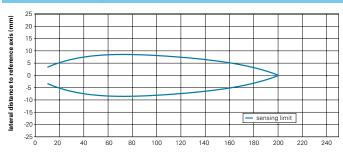


standard cable length 200 mm (L)

#### connection diagrams



#### typical sonic cone profile



object distance (So) from sensor front (mm

standard square target, size  $15 \times 15$  mm, positioned perpendicularly to sensor's reference axis

order reference	output circuit	connection types
URDK 10N8914	NPN make function (NO) / break function (NC)	cable, 2 m
URDK 10N8914/KS35A	NPN make function (NO) / break function (NC)	flylead connector M8, L=200 mm
URDK 10N8914/S35A	NPN make function (NO) / break function (NC)	connector M8
URDK 10P8914 PNP make function (NO) / break function (NC) cable, 2 m		cable, 2 m
URDK 10P8914/KS35A	PNP make function (NO) / break function (NC)	flylead connector M8, L=200 mm
URDK 10P8914/S35A	PNP make function (NO) / break function (NC)	connector M8



#### Sd = 200 mm

- internal and external Teach-in
- small sonic beam angle
- compact housing

general data  scanning range Sd
reflector position Sde 40 200 mm  adjusting range reflector (operating range)  adjusting range reflector (limit range)  repeat accuracy < 1,5 mm  temperature drift < 2 % Sde  response time ton < 10 ms  release time toff < 10 ms  sonic frequency 380 kHz  adjustment Teach-in alignment aid target indication flashing output indicator LED green  electrical data  voltage supply range +Vs 12 30 VDC
adjusting range reflector (operating range)  adjusting range reflector (limit range)  repeat accuracy  temperature drift  < 2 % Sde  response time ton  release time toff  < 10 ms  release time toff  < 10 ms  sonic frequency  adjustment  alignment aid  output indicator  electrical data  voltage supply range +Vs   ± 2,5 % Sde  ± 2,5 % Sde  - 1,5 mm  < 10 ms  - 10
(operating range)         adjusting range reflector (limit range)         repeat accuracy       < 1,5 mm
adjusting range reflector (limit range)  repeat accuracy < 1,5 mm  temperature drift < 2 % Sde  response time ton < 10 ms  release time toff < 10 ms  sonic frequency 380 kHz  adjustment Teach-in  alignment aid target indication flashing output indicator LED green  electrical data  voltage supply range +Vs 12 30 VDC
repeat accuracy < 1,5 mm  temperature drift < 2 % Sde  response time ton < 10 ms  release time toff < 10 ms  sonic frequency 380 kHz  adjustment Teach-in  alignment aid target indication flashing  output indicator LED green  electrical data  voltage supply range +Vs 12 30 VDC
temperature drift < 2 % Sde  response time ton < 10 ms  release time toff < 10 ms  sonic frequency 380 kHz  adjustment Teach-in alignment aid target indication flashing output indicator LED green  electrical data voltage supply range +Vs 12 30 VDC
response time ton < 10 ms release time toff < 10 ms sonic frequency 380 kHz adjustment Teach-in alignment aid target indication flashing output indicator LED green electrical data voltage supply range +Vs 12 30 VDC
release time toff < 10 ms sonic frequency 380 kHz adjustment Teach-in alignment aid target indication flashing output indicator LED green electrical data voltage supply range +Vs 12 30 VDC
sonic frequency adjustment Teach-in alignment aid target indication flashing output indicator LED green electrical data voltage supply range +Vs 12 30 VDC
adjustment Teach-in alignment aid target indication flashing output indicator LED green electrical data voltage supply range +Vs 12 30 VDC
alignment aid target indication flashing output indicator LED green  electrical data voltage supply range +Vs 12 30 VDC
output indicator LED green  electrical data  voltage supply range +Vs 12 30 VDC
electrical data voltage supply range +Vs 12 30 VDC
voltage supply range +Vs 12 30 VDC
current consumption max. (no 35 mA load)
output current < 200 mA
voltage drop Vd < 2 VDC
residual ripple < 10 % Vs
short circuit protection yes
reverse polarity protection yes
mechanical data
type rectangular
housing material polyester
width / diameter 20 mm
height / length 42 mm
depth 15 mm
connection types connector M8
ambient conditions
operating temperature -10 +60 °C
protection class IP 67

## connectors and mating connectors ESG 32AH0200 Connector M8, 4 pin. s

ESG 32AH0200	Connector IVI8, 4 pin, straight, 2 m	
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		

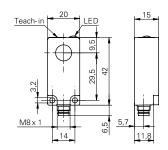
additional cable connectors and field wireable connectors: see accessories

Accessories	
10150326	Sensofix series 10 / series 20
10153290 Sonic beam deflector series 20	
for details: see accessories section	

order reference	output circuit
URDK 20N6914/S35A	NPN make function (NO)
URDK 20N7914/S35A	NPN break function (NC)
URDK 20P6914/S35A	PNP make function (NO)
URDK 20P7914/S35A	PNP break function (NC)



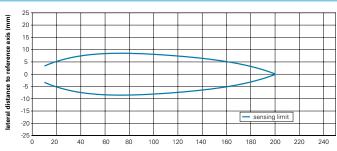
#### dimension drawing



#### connection diagrams



#### typical sonic cone profile



#### object distance (So) from sensor front (mm

standard square target, size  $15 \times 15$  mm, positioned perpendicularly to sensor's reference axis

#### Sd = 400 mm

- internal and external Teach-in
- wide sonic beam angle
- compact housing

general data	
scanning range Sd	0 400 mm
reflector position Sde	100 400 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 25 ms
release time toff	< 25 ms
sonic frequency	290 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

#### connectors and mating connectors

ESG 32AH0200	Connector M8, 4 pin, straight, 2 m	
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		

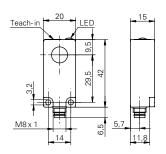
additional cable connectors and field wireable connectors: see accessories

Accessories	
10150326	Sensofix series 10 / series 20
10153290	Sonic beam deflector series 20
for details: see accessories section	

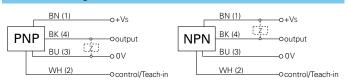
order reference	output circuit
URDK 20N6912/S35A	NPN make function (NO)
URDK 20N7912/S35A	NPN break function (NC)
URDK 20P6912/S35A	PNP make function (NO)
URDK 20P7912/S35A	PNP break function (NC)

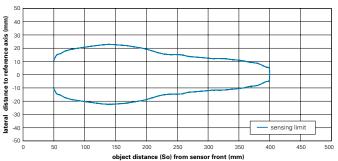


#### dimension drawing



#### connection diagrams





standard target with 30 x 30mm, directed rectangular to sensor's reference a



#### Sd = 1000 mm

- internal and external Teach-in
- small sonic beam angle
- compact housing

general data	
scanning range Sd	0 1000 mm
reflector position Sde	200 1000 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 50 ms
release time toff	< 50 ms
sonic frequency	240 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

#### connectors and mating connectors

ESG 32AH0200	Connector M8, 4 pin, straight, 2 m	
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		

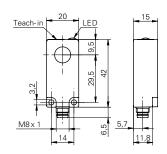
additional cable connectors and field wireable connectors: see accessories

Accessories		
10150326	Sensofix series 10 / series 20	
10153290 Sonic beam deflector series 20		
for details: see accessories section		

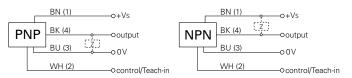
order reference	output circuit
URDK 20N6903/S35A	NPN make function (NO)
URDK 20N7903/S35A	NPN break function (NC)
URDK 20P6903/S35A	PNP make function (NO)
URDK 20P7903/S35A	PNP break function (NC)



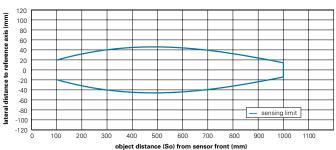
#### dimension drawing



#### connection diagrams



#### typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axi

#### Sd = 1000 mm

- potentiometer
- synchronization output
- detects sound absorbing objects

general data	
scanning range Sd	0 1000 mm
reflector position Sde	200 1000 mm
adjusting range reflector	± 2,5 % Sde
(operating range)	± 2,5 % Sue
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 3 mm
temperature drift	< 2 % Sde
synchronization	yes
multiplex version	on request
response time ton (sync on)	< 50 ms
release time toff (sync on)	< 50 ms
sonic frequency	240 kHz
adjustment	potentiometer
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

#### connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m	
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		

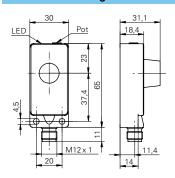
#### Accessories

10152386	Sensofix series 30	
for details: see accessories section		

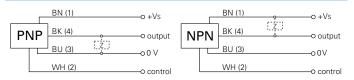
order reference	output circuit
URDK 30N1703/S14	NPN make function (NO)
URDK 30N3703/S14	NPN break function (NC)
URDK 30P1703/S14	PNP make function (NO)
URDK 30P3703/S14	PNP break function (NC)

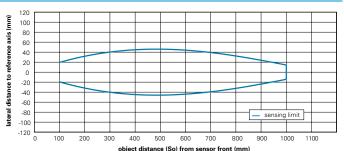


#### dimension drawing



#### connection diagrams





standard target with 30 x 30 mm, directed rectangular to sensor's reference axis



#### Sd = 1000 mm

- detects sound absorbing objects
- long sensing range / no blind range
- short response time

general data		
scanning range Sd	0 1000 mm	
reflector position Sde	200 1000 mm	
adjusting range reflector (operating range)	± 2,5 % Sde	
adjusting range reflector (limit range)	± 5 % Sde	
repeat accuracy	< 3 mm	
temperature drift	< 2 % Sde	
power-up drift	compensated after 15 min.	
response time ton	< 50 ms	
release time toff	< 50 ms	
sonic frequency	220 kHz	
adjustment	qTeach	
alignment aid	light indicator flashing	
light indicator	LED yellow	
power on indication	LED green	
alignment measuring axis	< 2°	
electrical data		
voltage supply range +Vs	12 30 VDC	
current consumption typ.	35 mA	
output circuit	push-pull	
output current	< 100 mA	
voltage drop Vd	< 3,5 VDC	
residual ripple	< 10 % Vs	
short circuit protection	yes	
reverse polarity protection	yes	
mechanical data		
type	rectangular	
housing material	plastic (ASA, PMMA)	
width / diameter	18 mm	
height / length	45 mm	
depth	32 mm	
ambient conditions		
operating temperature	-25 +65 °C	
storage temperature	-40 +75 °C	
protection class	IP 67	
connectors and mating connectors		
ESG 34AH0200 Connector M12, 4 pin, straight, 2 m		

composition and making commotions		
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m	
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		
accassorias		

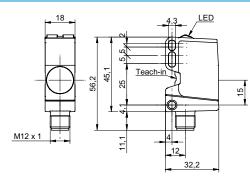
40000001100		
Accessories		
11099942	Sensofix O500/U500	
11092246	Mounting bracket O500/U500 (L design)	
11111164	Mounting bracket O500/U500 - Retrofit for sensors series 30	
11111163	Sonic beam deflector for sensors U500	
for details: see accessories section		

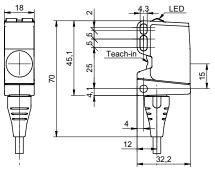
order reference	connection types
U500.RA0-11127347	cable PUR 4 x 0,25, 2 m
U500.RA0-11110579	connector M12



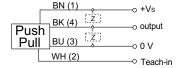


#### dimension drawings

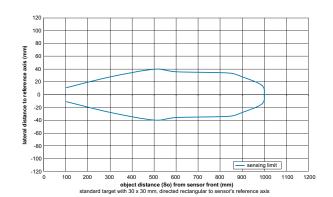




#### connection diagram



#### typical sonic cone profile



70

# 

# Sd = 2000 mm

- internal Teach-in
- long sensing range
- detects sound absorbing objects

general data	
scanning range Sd	0 2000 mm
reflector position Sde	400 2000 mm
adjusting range reflector (operating range)	± 4 % Sde
adjusting range reflector (limit range)	± 6 % Sde
repeat accuracy	< 3 mm
temperature drift	< 2 % Sde
response time ton	< 80 ms
release time toff	< 80 ms
sonic frequency	200 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

#### connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m	
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		
accessories		

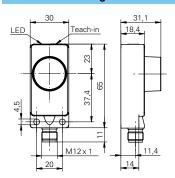
#### Accessories

10152386	Sensofix series 30	
for details: see accessories section		

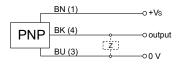
order reference	output circuit
URDK 30P6104/S14	PNP make function (NO)
URDK 30P7104/S14	PNP break function (NC)



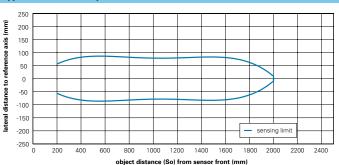
#### dimension drawing



#### connection diagram



### typical sonic cone profile



standard target with 100 x 100 mm, positioned perpendicularly to sensor's reference axis



### Sd = 40 mm

- high speed sensors
- with beam columnator for measurement in very small containers

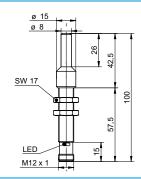
general data	
special type	Highspeed
scanning range Sd	0 40 mm
reflector position Sde	10 40 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 1,5 ms
release time toff	< 1,5 ms
switching frequency	< 200 Hz
sonic frequency	380 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	100 mm
connection types	connector M12
ambient conditions	
operating temperature	
operating temperature	-10 +60 °C

# connectors and mating connectors ESG 34AH0200 Connector M12, 4 pin, straight, 2 m ESW 33AH0200 Connector M12, 4 pin, angular, 2 m additional cable connectors and field wireable connectors: see accessories

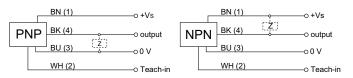
Accessories	
10151720	Sensofix series 12 round
10141584 Teach-in Adapter M12	
for details: see accessories section	



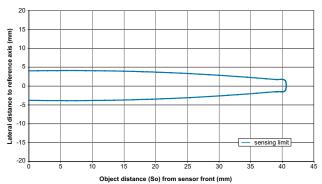
#### dimension drawing



#### connection diagrams



#### typical sonic cone profile



Standard target with 15\*15 mm, directed rectangular to sensor's reference axis

order reference	output circuit
URAM 12N8910/S14OD	NPN make function (NO) / break function (NC)
URAM 12P8910/S14OD	PNP make function (NO) / break function (NC)

-o Teach-in



### Sd = 70 mm

- high speed sensoren
- small sonic beam angle
- external Teach-in

general data	
special type	Highspeed
scanning range Sd	0 70 mm
reflector position Sde	40 70 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 1,5 ms
release time toff	< 1,5 ms
switching frequency	< 200 Hz
sonic frequency	380 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	70 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

# ESG 34AH0200 Connector M12, 4 pin, straight, 2 m ESW 33AH0200 Connector M12, 4 pin, angular, 2 m additional cable connectors and field wireable connectors: see accessories Accessories 10151720 Sensofix series 12 round

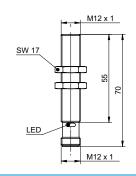
Teach-in Adapter M12

10141584

for details: see accessories section



#### dimension drawing



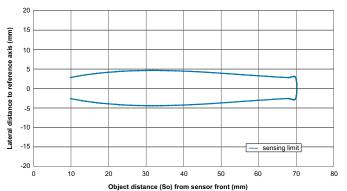
# BN (1) O +Vs BN (1) O +Vs NPN BK (4) O output BU (3) O O V

-⊙ Teach-in

WH (2)

#### typical sonic cone profile

WH (2)



Standard target with 15\*15 mm, directed rectangular to sensor's reference axis

order reference	output circuit
URAM 12N8910/S14O	NPN make function (NO) / break function (NC)
URAM 12P8910/S14O	PNP make function (NO) / break function (NC)



- internal and external Teach-in
- sensorfront chemically resistant
- stainless steel housing

general data	
special type	chemically resistant
scanning range Sd	0 400 mm
reflector position Sde	120 400 mm
repeat accuracy	< 1,5 mm
temperature drift	< 2 % Sde
response time ton	< 25 ms
release time toff	< 25 ms
sonic frequency	400 kHz
adjustment	Teach-in
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	stainless steel 1.4435 (V4A)
width / diameter	18 mm
height / length	91,5 mm
connection types	connector M12
coating active face	Parylene
material O-ring	FFKM
front of sensor durable against pressure	6 bar, 20'000 cycle
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67
connectors and mating connector	ors
ESG 34AH0200 Connector M12, 4 pin, straight, 2 m	

L30 34A110200	Connector Witz, 4 pin, straight, 2 m	
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m	
additional cable connectors and field wireable connectors: see		

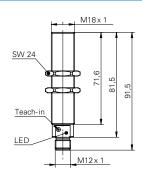
additional cable connectors and field wireable connectors: see accessories

accessories	
Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
ZADAP-M18.SWING	Mounting bracket for adjustment for series 18
10164264	Sonic beam deflector series 18 rectangular
for details: see accessories section	

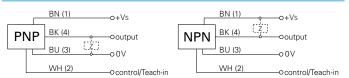
order reference	output circuit
URAR 18N6912/S14G	NPN make function (NO)
URAR 18N7912/S14G	NPN break function (NC)
URAR 18P6912/S14G	PNP make function (NO)
URAR 18P7912/S14G	PNP break function (NC)



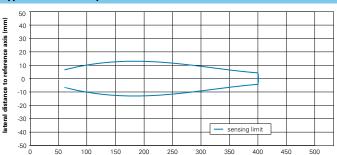
#### dimension drawing



#### connection diagrams



#### typical sonic cone profile



object distance (So) from sensor front (mm)

standard target with 30 x 30mm, directed rectangular to sensor's reference axis

# Sd = 1000 mm

- detects sound absorbing objects
- long sensing range / no blind range
- short response time

general data	
scanning range Sd	0 1000 mm
reflector position Sde	200 1000 mm
adjusting range reflector (operating range)	± 2,5 % Sde
adjusting range reflector (limit range)	± 5 % Sde
repeat accuracy	< 3 mm
temperature drift	< 2 % Sde
power-up drift	compensated after 10 min.
response time ton	< 50 ms
release time toff	< 50 ms
sonic frequency	220 kHz
adjustment	qTeach
alignment aid	light indicator flashing
light indicator	LED yellow
power on indication	LED green
alignment measuring axis	< 2°
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption typ.	35 mA
output circuit	push-pull
output current	< 100 mA
voltage drop Vd	< 3,5 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated / TR90
width / diameter	18 mm
height / length	64 mm
connection types	connector M12
ambient conditions	
operating temperature	-25 +70 °C
storage temperature	-40 +85 °C
protection class	IP 67

#### connectors and mating connectors

ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
additional cable co	onnectors and field wireable connectors; see

accessories

Accessories
10151658

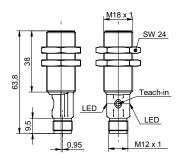
10151658	Sensofix series 18
10164264	Sonic beam deflector series 18 rectangular

for details: see accessories section

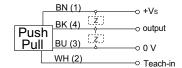
#### order reference UR18.RA0-11120042



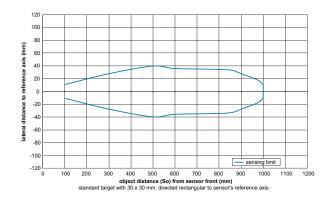
#### dimension drawing



#### connection diagram



#### typical sonic cone profile





### $Sd = 3000 \, mm$

- Teach-in or potentiometer
- synchronization output
- long sensing range

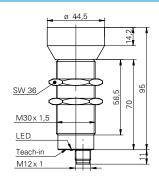
general data	
scanning range Sd	0 3000 mm
reflector position Sde	600 3000 mm
adjusting range reflector (operating range)	± 4 % Sde
adjusting range reflector (limit range)	± 6 % Sde
repeat accuracy	< 3 mm
synchronization	yes
multiplex version	on request
response time ton	< 160 ms
release time toff	< 160 ms
sonic frequency	120 kHz
alignment aid	target indication flashing
output indicator	LED green
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption max. (no load)	35 mA
output current	< 200 mA
voltage drop Vd	< 2 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	30 mm
height / length	95 mm
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

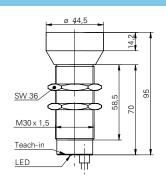
# Connectors and mating connectors ESG 34AH0200 Connector M12, 4 pin, straight, 2 m ESW 33AH0200 Connector M12, 4 pin, angular, 2 m additional cable connectors and field wireable connectors: see accessories





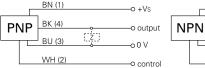
#### dimension drawings





Teach-in = Teach-in or potentiometer

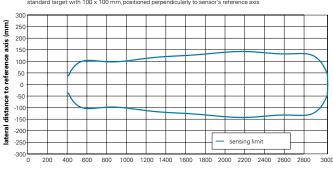
#### connection diagrams





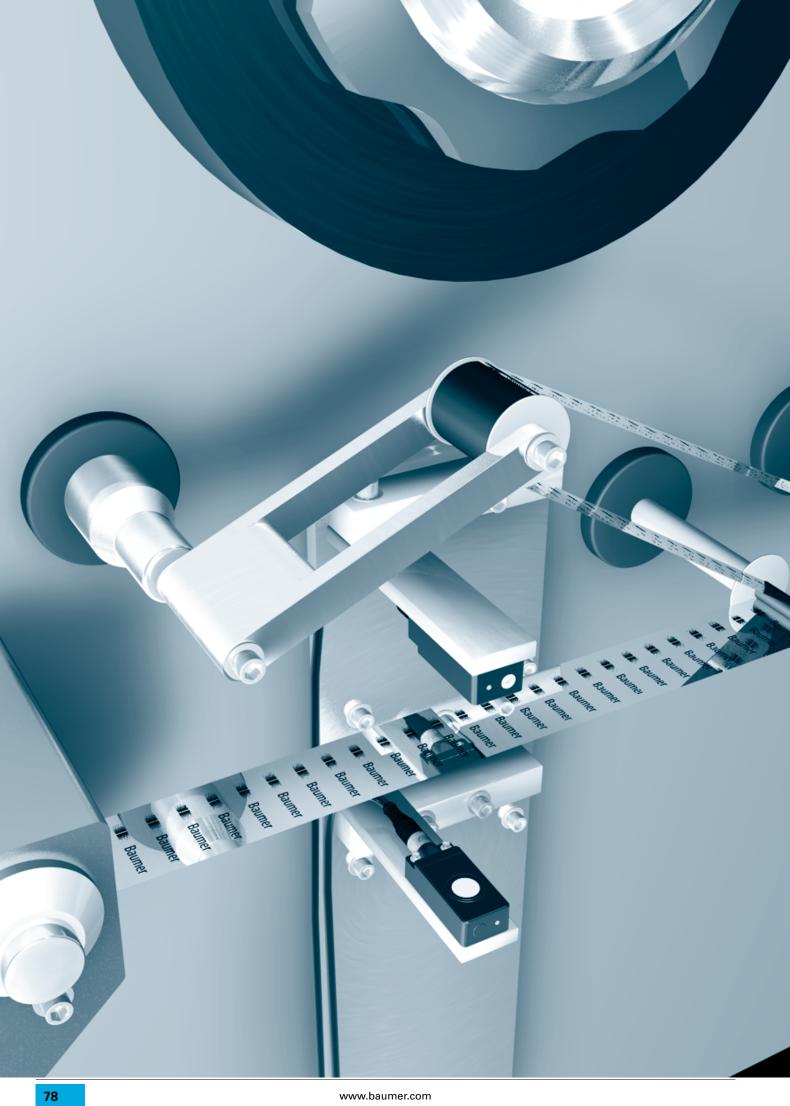
#### typical sonic cone profile

typical sonic beam of ultrasonic sensors with sensing range 400...3000mm standard target with 100  $\times$  100 mm, positioned perpendicularly to sensor's reference axis



object distance (So) from sensor front (mm)

order reference	adjustment	output circuit	temperature drift	connection types
URAM 50N1721	potentiometer	NPN make function (NO)	< 0,18 % Sde/K	cable, 2 m
URAM 50N1721/S14	potentiometer	NPN make function (NO)	< 0,18 % Sde/K	connector M12
URAM 50P6121	Teach-in	PNP make function (NO)	< 2 % Sde	cable, 2 m
URAM 50P6121/S14	Teach-in	PNP make function (NO)	< 2 % Sde	connector M12
URAM 50P7121	Teach-in	PNP break function (NC)	< 2 % Sde	cable, 2 m
URAM 50P7121/S14	Teach-in	PNP break function (NC)	< 2 % Sde	connector M12





# Through beam sensors

Introduction F Rectangular designs F

Page 80 Page 82

# **Ultrasonic through beam sensors**

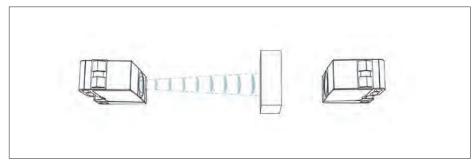


## Description

The emitter and the receiver are in two separate housings. The continuous signal by the emitter is picked up by the receiver. An object interrupting the sonic beam will make the receiver react by giving an output signal. The user may adjust the amplification of the input signal where required.

When an object interrupts the sonic beam, the receiver will react and give an output signal. With the help of the built in potentiometer, the user can adjust the amplification of the input signal, as necessary.

The state of the output stage as well as the signal intensity are indicated by an LED.



#### Hysteresis

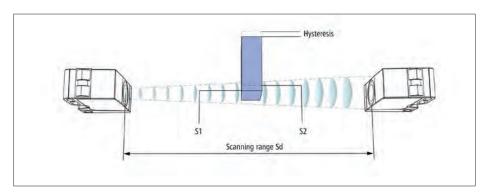
Hysteresis is the difference between the operating point (S1) and the release point (S2). If an object interrupts the sonic beam, the signal level must be increased by about 75 % in order to reset the output signal. Objects which follow one another in quick succession can therefore be easily detected.

#### Sonic beam angle $\alpha$

The sonic beam angle  $(\alpha)$  defines the boundaries of the emitted conical beam of the ultrasonic through beam sensor.

#### Repeatability

Due to the narrow angle of the sonic beam the repeatability of the switching point of two successive targets, under identical conditions, is better than 3 mm.



# Ultrasonic through beam sensors



## Teach-in procedure Series 20

All adjustments can be made with the internal Teach-in key.

#### Sensitivity Adjustment

The LEDs on the display indicate the receiver's sensitivity. The sensitivity can be called up at any time by pressing the Teach-in key, even with locked teaching functionality.

Move the emitter and receiver to the desired position.

Switch the emitter to its adjustment mode by pressing and holding the Teach-in key for approx. two seconds until the green LED begins flashing. Release the Teach-in key. The green LED now indicates the switching state. Press the Teach-in key repeatedly until the desired sensitivity is achieved and the green LED is continuously on.

Sensitivity is indicated by the yellow LEDs on the display.

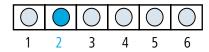
To complete the Teach-in process, press and hold the Teach-in key for approx. two seconds until the green LED begins flashing rapidly. Release the Teach-in key.

The LED is off!

#### **Response Time**

Switch the sensor to teach mode by pressing and holding the Teach-in key for approx. four seconds until the red LED begins flashing. Release the Teach-in key. The red LED lights up continuously. Press the Teach-in key repeatedly until the desired response time is achieved.

LED display:



no LED on; approximately 5 ms response time delay

- 1. LED on; approximately 10 ms response time delay
- 2. LED on; approximately 20 ms response time delay
- 3. LED on; approximately 40 ms response time delay
- 4. LED on; approximately 80 ms response time delay
- 5. LED on; approximately 160 ms response time delay
- 6. LED on; approximately 320 ms response time delay

To complete the Teach-in process, press and hold the Teach-in key for approx. two seconds until the red LED begins flashing rapidly. Release the Teach-in key. The response time is now set.

#### Resetting the receiver to its original factory settings

Pressing and holding the Teach-in key for longer than six seconds will return the sensor to its factory settings. This is indicated on the receiver by the rapid flashing of the green/red LED.

#### Teach-in lock

The Teach-in function is locked five minutes after power up or five minutes after the end of the last Teach-in process.

# Sd = 1000 mm

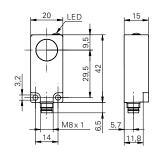
- Teach-in
- LED Display
- response time adjustable <= 5 ... 320 ms

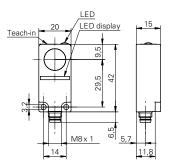
•	
general data	
scanning range Sd	0 1000 mm
scanning range far limit Sde	0 1000 mm
alignment aid	target indication flashing
receiver	
object size (at Sd = 50 mm)	> 2 cm <sup>2</sup>
hysteresis typ.	5 mm
repeat accuracy	< 3 mm
response time ton	< 5 ms
release time toff	< 5 ms
adjustment	Teach-in
output indicator	LED green
emitter	
sonic frequency	250 kHz
power on indication	LED yellow
electrical data	
voltage supply range +Vs	15 30 VDC
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
receiver	
current consumption max. (no load)	30 mA
output circuit	PNP make function (NO)
output current	< 200 mA
voltage drop Vd	< 2 VDC
emitter	
current consumption max. (no load)	40 mA
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67
connectors and mating connector	ors
ESG 32AH0200 Connector M8,	4 pin, straight, 2 m
ESW 31AH0200 Connector M8,	4 pin, angular, 2 m
additional cable connectors and fiel accessories	d wireable connectors: see
Accessories	
10150326 Sensofix series	3 10 / series 20
6 1 4 21	





#### dimension drawings

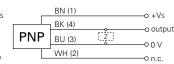




emitter receiver

#### connection diagrams





UEDK 20P6103/S35A receiver
USDK 20D9003/S35A emitter

emitter / receiver

order reference

for details: see accessories section

# Sd = 700 mm

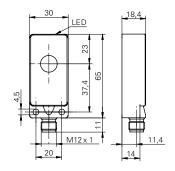
- potentiometer
- complementary outputs
- response time <= 5 ms

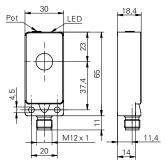
general data	
scanning range Sd	0 700 mm
scanning range far limit Sde	0 700 mm
alignment aid	target indication flashing
receiver	
object size (at Sd = 50 mm)	> 2 cm <sup>2</sup>
hysteresis typ.	5 mm
repeat accuracy	< 3 mm
response time ton	< 5 ms
release time toff	< 5 ms
adjustment	potentiometer
output indicator	LED green
emitter	
sonic frequency	220 kHz
power on indication	LED yellow
electrical data	
voltage supply range +Vs	12 30 VDC
residual ripple	< 10 % Vs
reverse polarity protection	yes
receiver	
current consumption max. (no load)	30 mA
autaut aurrant	000 4
output current	< 200 mA
voltage drop Vd	< 2 VDC
<del></del>	
voltage drop Vd	< 2 VDC
voltage drop Vd short circuit protection	< 2 VDC
voltage drop Vd short circuit protection emitter	< 2 VDC yes
voltage drop Vd short circuit protection emitter current consumption max. (no load)	< 2 VDC yes
voltage drop Vd short circuit protection emitter current consumption max. (no load) mechanical data	< 2 VDC yes  22 mA
voltage drop Vd short circuit protection emitter current consumption max. (no load) mechanical data type	< 2 VDC yes  22 mA  rectangular
voltage drop Vd short circuit protection emitter current consumption max. (no load) mechanical data type housing material	< 2 VDC yes  22 mA  rectangular polyester / die-cast zinc
voltage drop Vd short circuit protection emitter current consumption max. (no load) mechanical data type housing material width / diameter	< 2 VDC yes  22 mA  rectangular polyester / die-cast zinc 30 mm
voltage drop Vd short circuit protection emitter current consumption max. (no load) mechanical data type housing material width / diameter height / length	< 2 VDC yes  22 mA  rectangular polyester / die-cast zinc 30 mm 65 mm
voltage drop Vd short circuit protection emitter current consumption max. (no load) mechanical data type housing material width / diameter height / length depth	< 2 VDC yes  22 mA  rectangular polyester / die-cast zinc 30 mm 65 mm
voltage drop Vd short circuit protection emitter current consumption max. (no load) mechanical data type housing material width / diameter height / length depth ambient conditions	< 2 VDC yes  22 mA  rectangular polyester / die-cast zinc 30 mm 65 mm 18,5 mm
voltage drop Vd short circuit protection emitter current consumption max. (no load) mechanical data type housing material width / diameter height / length depth ambient conditions operating temperature	< 2 VDC yes  22 mA  rectangular polyester / die-cast zinc 30 mm 65 mm 18,5 mm  0 +60 °C IP 67
voltage drop Vd short circuit protection emitter current consumption max. (no load) mechanical data type housing material width / diameter height / length depth ambient conditions operating temperature protection class connectors and mating connectors	< 2 VDC yes  22 mA  rectangular polyester / die-cast zinc 30 mm 65 mm 18,5 mm  0 +60 °C IP 67





#### dimension drawings connector

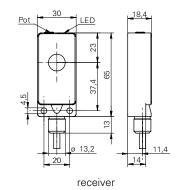




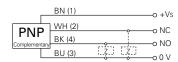
receiver

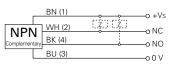
emitter dimension drawings cable

# emitter



#### connection diagrams



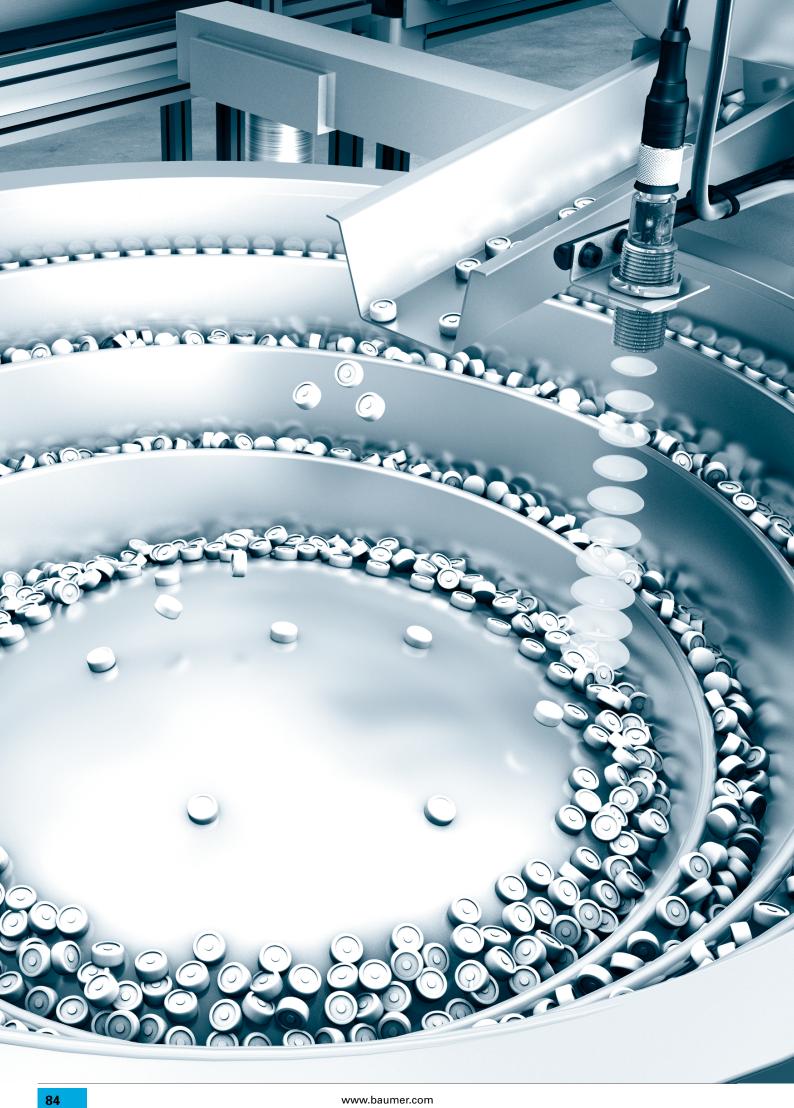


10152386	Sensofix series 3	0
for details: see acce	essories section	
order reference		emitter / receiver
UEDK 30N5103		receiver
LIEDK 30NE103/S	14	rocciver

additional cable connectors and field wireable connectors: see

accessories Accessories

order reference	emitter / receiver	output circuit	connection types
UEDK 30N5103	receiver	NPN complementary	cable, 2 m
UEDK 30N5103/S14	receiver	NPN complementary	connector M12
UEDK 30P5103	receiver	PNP complementary	cable, 2 m
UEDK 30P5103/S14	receiver	PNP complementary	connector M12
USDK 30D9003	emitter	-	cable, 2 m
USDK 30D9003/S14	emitter	-	connector M12



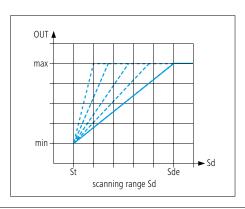


# Distance sensors

Introduction Page 86
Overview Page 88
Rectangular designs Page 92
Cylindrical designs Page 119



#### Sensors with potentiometer

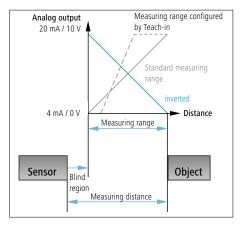


The sensor provides a distance proportional analog current or analog voltage output, allowing simply applied, non-contact distance measurement. The user can change the slope of the output curve using the built-in potentiometer. By doing so, they are able to define the required resolution. Sensor versions, which have a built-in D/A-Converter, generate output signals divided into discrete steps. Applications having long cable runs where there might be EMI or RFI interferences, should use sensors with an analog current output.

#### Sensors with Teach-in

#### Adjustment of 0 ... 10 V output function

To switch the sensor into Teach mode, hold the Teach-in button for 2 seconds or more. Successful entry into Teach-mode is signaled by the flashing bicolor LED. Upon release of the Teach button the red LED will flash. Another press on the button will teach in the close limit (Sdc) which is followed by the far limit (Sde). The sensor LED lighting up for 2 seconds will confirm the completed teaching operation. At this point, you may set the close limit (Sdc) by placing the target at the required distance from the sensor (the closest the target will be to the sensor face) and briefly pushing the button or connecting the Teach-in wire with +VS. The LED will then flash Amber. Far limit (Sde) may now be programmed by placing the target at the farthest required distance from the sensor by briefly pressing the button or connecting the Teach-in wire with +VS. Both LEDs will be "on" for 2 seconds to confirm proper completion of Teach-in process.



#### Programmable output curve

#### Optional on request

Separate digital PNP output with one switching point which may be set using the Teach-in function.

#### Inverting the output function to 10 ... 0 V

Sensor output signal can be inverted to 10 ... 0 V by teaching the far limit Sde first and the sensor close limit Sdc second.

#### Restore default settings or improper set up

Press teach-in button and hold for more than 6 seconds. Both sensor LEDs flashing fast indicate the restore operation.

#### Teach-in lock

The Teach-in function is locked five minutes after power up or five minutes after the end of the last Teach-in process.

With  $qTeach^{TM}$  we are introducing a new, convenient and wear-free teach procedure. Teaching of O500 sensors is just by a touch with any ferromagnetic tool. A blue LED light provides clear optical feedback. To prevent user errors,  $qTeach^{TM}$  locks autonomously after 5 minutes.

qTeach™

# **Ultrasonic distance sensors**



Linearity

Deviations in linearity are mainly generated within the sensor and by changes in ambient temperature. Resolution, temperature drift and repeatability define the linearity error.

Minimum load resistance

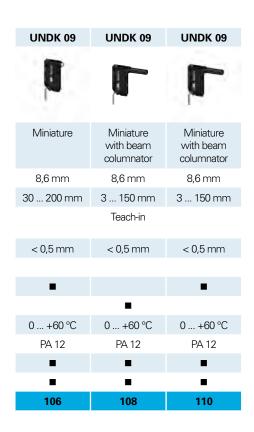
The voltage drop across t he load resistance is proportional to the current, using a sensor with current output. To ensure a proper functioning of the output stage do not exceed the maximum permissible load resistance as stated in the data sheet.

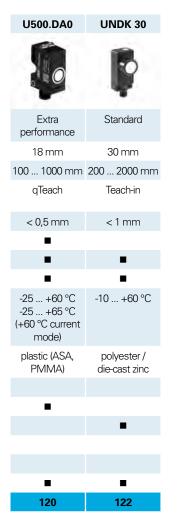
Resolution

Defines the smallest position change of the object which causes a change in voltage or current at the sensor output.

# rectangular designs

	UNCK 09	UNCK 09	UNCK 09	UNCK 09	UNCK 09	UNDK 09	UNDK 09
	-					0	0
		<b>O</b> IO-Link					<b>O IO</b> -Link
	Miniature	Miniature	Miniature	Miniature with beam columnator	Miniature with beam columnator	Miniature	Miniature
width / diameter	8,6 mm	8,6 mm	8,6 mm	8,6 mm	8,6 mm	8,6 mm	8,6 mm
scanning range Sd	30 200 mm	30 200 mm	30 200 mm	3 150 mm	3 150 mm	30 200 mm	30 200 mm
adjustment	Teach-in	Teach-in and IO-Link		Teach-in		Teach-in	Teach-in and IO-Link
repeat accuracy	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm
push-pull / IO-Link		•					•
RS 232			•		•		
voltage output	•			-		•	
operating temperature	0 +60 °C	0 +60 °C	0 +60 °C	0 +60 °C	0 +60 °C	0 +60 °C	0 +60 °C
housing material	PA 12	PA 12	PA 12	PA 12	PA 12	PA 12	PA 12
cable PUR 4 x 0,08, 2 m	•	•	•	•	•	•	
flylead connector M8, L=200 mm	•	•	•	•	•	•	•
page	96	97	98	100	102	104	105
product family	UNDK 10	UNDK 20	UNDK 20	UNDK 20	UNDK 30	UNDK 30	UNDK 30
	-	0	0	•	6		
		•	-	•	*		Ψ
	Miniature	Standard	Standard	Standard	Standard	Standard	Standard
width / diameter	Miniature 10,4 mm	Standard 20 mm	Standard 20 mm	Standard 20 mm	Standard 30 mm	Standard 30 mm	Standard 30 mm
width / diameter scanning range Sd					30 mm	30 mm	
·	10,4 mm	20 mm	20 mm	20 mm	30 mm	30 mm	30 mm 100 1000 mr Teach-in
scanning range Sd	10,4 mm 20 200 mm	20 mm 20 200 mm	20 mm 60 400 mm	20 mm 100 1000 mm	30 mm 30 250 mm Teach-in	30 mm 60 400 mm Teach-in	30 mm 100 1000 mr Teach-in
scanning range Sd adjustment	10,4 mm 20 200 mm Teach-in	20 mm 20 200 mm Teach-in	20 mm 60 400 mm Teach-in	20 mm 100 1000 mm Teach-in	30 mm 30 250 mm Teach-in potentiometer	30 mm 60 400 mm Teach-in potentiometer	30 mm 100 1000 mr Teach-in potentiometer
scanning range Sd adjustment repeat accuracy	10,4 mm 20 200 mm Teach-in	20 mm 20 200 mm Teach-in	20 mm 60 400 mm Teach-in	20 mm 100 1000 mm Teach-in	30 mm 30 250 mm Teach-in potentiometer	30 mm 60 400 mm Teach-in potentiometer	30 mm 100 1000 mr Teach-in potentiomete
scanning range Sd adjustment repeat accuracy voltage - / current output	10,4 mm 20 200 mm Teach-in < 0,5 mm	20 mm 20 200 mm Teach-in < 0,5 mm	20 mm 60 400 mm Teach-in < 0,5 mm	20 mm 100 1000 mm Teach-in < 0,5 mm	30 mm 30 250 mm Teach-in potentiometer < 0,5 mm	30 mm 60 400 mm Teach-in potentiometer < 0,5 mm	30 mm 100 1000 mr Teach-in potentiomete < 0,5 mm
scanning range Sd adjustment repeat accuracy voltage - / current output voltage output	10,4 mm 20 200 mm Teach-in < 0,5 mm	20 mm 20 200 mm Teach-in < 0,5 mm	20 mm 60 400 mm Teach-in < 0,5 mm	20 mm 100 1000 mm Teach-in < 0,5 mm	30 mm 30 250 mm Teach-in potentiometer < 0,5 mm	30 mm 60 400 mm Teach-in potentiometer < 0,5 mm	30 mm 100 1000 mr Teach-in potentiometer < 0,5 mm
scanning range Sd adjustment repeat accuracy voltage - / current output voltage output current output	10,4 mm 20 200 mm Teach-in < 0,5 mm	20 mm 20 200 mm Teach-in < 0,5 mm	20 mm 60 400 mm Teach-in < 0,5 mm	20 mm 100 1000 mm Teach-in < 0,5 mm	30 mm 30 250 mm Teach-in potentiometer < 0,5 mm	30 mm 60 400 mm Teach-in potentiometer < 0,5 mm	30 mm 100 1000 mr Teach-in potentiometer < 0,5 mm
scanning range Sd adjustment  repeat accuracy voltage - / current output voltage output current output operating temperature	10,4 mm 20 200 mm Teach-in < 0,5 mm	20 mm 20 200 mm Teach-in < 0,5 mm  -10 +60 °C	20 mm 60 400 mm Teach-in < 0,5 mm  -10 +60 °C	20 mm 100 1000 mm Teach-in < 0,5 mm	30 mm 30 250 mm Teach-in potentiometer < 0,5 mm  -10 +60 °C	30 mm 60 400 mm Teach-in potentiometer < 0,5 mm  -10 +60 °C	30 mm  100 1000 mr  Teach-in potentiometer  < 0,5 mm  -10 +60 °C
scanning range Sd adjustment repeat accuracy voltage -/ current output voltage output current output operating temperature housing material	10,4 mm 20 200 mm Teach-in < 0,5 mm  -10 +60 °C	20 mm 20 200 mm Teach-in < 0,5 mm  -10 +60 °C	20 mm 60 400 mm Teach-in < 0,5 mm  -10 +60 °C	20 mm 100 1000 mm Teach-in < 0,5 mm	30 mm 30 250 mm Teach-in potentiometer < 0,5 mm  -10 +60 °C	30 mm 60 400 mm Teach-in potentiometer < 0,5 mm  -10 +60 °C	30 mm  100 1000 mr  Teach-in potentiomete < 0,5 mm  -10 +60 °C
scanning range Sd adjustment  repeat accuracy voltage - / current output voltage output current output operating temperature  housing material cable PUR 4 x 0,08, 2 m	10,4 mm 20 200 mm Teach-in < 0,5 mm  -10 +60 °C	20 mm 20 200 mm Teach-in < 0,5 mm  -10 +60 °C	20 mm 60 400 mm Teach-in < 0,5 mm  -10 +60 °C	20 mm 100 1000 mm Teach-in < 0,5 mm	30 mm 30 250 mm Teach-in potentiometer < 0,5 mm  -10 +60 °C	30 mm 60 400 mm Teach-in potentiometer < 0,5 mm  -10 +60 °C	30 mm  100 1000 mr  Teach-in potentiometer  < 0,5 mm  -10 +60 °C
scanning range Sd adjustment  repeat accuracy voltage - / current output voltage output current output operating temperature  housing material  cable PUR 4 x 0,08, 2 m cable PUR 4 x 0,25, 2 m	10,4 mm 20 200 mm Teach-in < 0,5 mm  -10 +60 °C	20 mm 20 200 mm Teach-in < 0,5 mm  -10 +60 °C	20 mm 60 400 mm Teach-in < 0,5 mm  -10 +60 °C	20 mm 100 1000 mm Teach-in < 0,5 mm	30 mm 30 250 mm Teach-in potentiometer < 0,5 mm  -10 +60 °C  polyester / die-cast zinc	30 mm 60 400 mm Teach-in potentiometer < 0,5 mm  -10 +60 °C  polyester / die-cast zinc	30 mm  100 1000 mr  Teach-in potentiometer < 0,5 mm  -10 +60 °C  polyester / die-cast zinc
scanning range Sd adjustment  repeat accuracy voltage -/ current output voltage output current output operating temperature  housing material  cable PUR 4 x 0,08, 2 m cable PUR 4 x 0,25, 2 m cable, 2 m	10,4 mm 20 200 mm Teach-in < 0,5 mm  -10 +60 °C	20 mm 20 200 mm Teach-in < 0,5 mm  -10 +60 °C	20 mm 60 400 mm Teach-in < 0,5 mm  -10 +60 °C	20 mm 100 1000 mm Teach-in < 0,5 mm	30 mm 30 250 mm Teach-in potentiometer < 0,5 mm  -10 +60 °C  polyester / die-cast zinc	30 mm 60 400 mm Teach-in potentiometer < 0,5 mm  -10 +60 °C  polyester / die-cast zinc	30 mm  100 1000 mr  Teach-in potentiometer < 0,5 mm  -10 +60 °C  polyester / die-cast zinc
scanning range Sd adjustment  repeat accuracy voltage - / current output voltage output current output operating temperature  housing material cable PUR 4 x 0,08, 2 m cable PUR 4 x 0,25, 2 m cable, 2 m flylead connector M8, L=200 mm	10,4 mm 20 200 mm Teach-in < 0,5 mm  -10 +60 °C  plastic (ASA)	20 mm 20 200 mm Teach-in < 0,5 mm  -10 +60 °C	20 mm 60 400 mm Teach-in < 0,5 mm  -10 +60 °C	20 mm  100 1000 mm  Teach-in  < 0,5 mm  -10 +60 °C  polyester	30 mm 30 250 mm Teach-in potentiometer < 0,5 mm  -10 +60 °C  polyester / die-cast zinc	30 mm 60 400 mm Teach-in potentiometer < 0,5 mm  -10 +60 °C  polyester / die-cast zinc	30 mm  100 1000 mr  Teach-in potentiometer < 0,5 mm  -10 +60 °C  polyester / die-cast zinc





# cylindrical designs

product family	UNAM 12	UNAM 12	UNAM 12	UNAM 18	UR18.DA0	UNAR 18	UNAR 18	
		1						
special type	Miniature with beam columnator	Miniature	Miniature	Standard	Standard	Chemically resistant	Chemically resistant	
width / diameter	12 mm	12 mm	12 mm	18 mm	18 mm	18 mm	18 mm	
scanning range Sd	2 82 mm	20 200 mm	60 400 mm	100 1000 mm	100 1000 mm	60 400 mm	100 1000 mm	
adjustment	external Teach-in	external Teach-in	external Teach-in	Teach-in	qTeach	Teach-in	Teach-in	
repeat accuracy	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	< 0,5 mm	
voltage output	-	•			•		•	
current output			•		-		-	
operating temperature	-10 +60 °C	-10 +60 °C	-10 +60 °C	-10 +60 °C	-25 +60 °C -25 +70 °C	0 +60 °C	0 +60 °C	
housing material	brass nickel plated	brass nickel plated	brass nickel plated	brass nickel plated	brass nickel plated / TR90	stainless steel 1.4435 (V4A)	stainless steel 1.4435 (V4A)	
cable, 2 m								
connector M12				•	•			
page	123	124	125	126	127	128	129	

UNAM 30	UNAM 50	UNAM 70
		T
Standard	Large sensing distance	Large sensing distance
30 mm	30 mm	30 mm
100 1000 mm	400 2500 mm	600 6000 mm
Teach-in potentiometer	Teach-in	Teach-in
< 0,5 mm	< 1 mm	< 3 mm
•		
-		
-10 +60 °C	-10 +60 °C	-25 +60 °C
brass nickel plated	brass nickel plated	brass nickel plated
•	•	
•	•	•
130	131	132

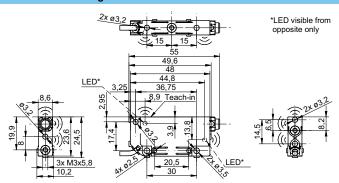
- short response time
- high resolution
- detects the smallest objects

scanning range Sd 30 200 mm  scanning range close limit Sdc 30 200 mm  repeat accuracy < 0,5 mm  response time ton < 35 ms  release time toff < 25 ms  temperature drift < 2 % of distance to target So sonic frequency adjustment aid target indication flashing light indicator yellow LED / red LED  electrical data voltage supply range +Vs 15 30 VDC  current consumption max. (no load) output circuit voltage output output signal 0 10 V / 10 0 V output current cricuit protection yes short circuit protection yes reverse polarity protection yes rectangular height / length depth 24,5 mm  ambient conditions on +60 °C		
scanning range close limit Sdc scanning range far limit Sde scanning scanning scanning scanning scanning scanning scanning scanning scanning range far limit Sde scanning scan	general data	
scanning range far limit Sde repeat accuracy resolution response time ton response time ton release time toff	scanning range Sd	30 200 mm
repeat accuracy < 0,5 mm resolution < 0,3 mm response time ton < 35 ms release time toff < 35 ms temperature drift < 2 % of distance to target So sonic frequency 380 kHz adjustment Teach-in alignment aid target indication flashing light indicator yellow LED / red LED  electrical data voltage supply range +Vs 15 30 VDC current consumption max. (no load) output circuit voltage output output signal 0 10 V / 10 0 V output current < 15 mA residual ripple < 10 % Vs short circuit protection yes reverse polarity protection yes mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 55 mm ambient conditions operating temperature 0 +60 °C	scanning range close limit Sdc	30 200 mm
resolution < 0,3 mm response time ton < 35 ms release time toff < 35 ms temperature drift < 2 % of distance to target So sonic frequency 380 kHz adjustment Teach-in alignment aid target indication flashing light indicator yellow LED / red LED  electrical data voltage supply range +Vs 15 30 VDC current consumption max. (no load) output circuit voltage output output signal 0 10 V / 10 0 V output current < 15 mA residual ripple < 10 % Vs short circuit protection yes reverse polarity protection yes mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 55 mm ambient conditions operating temperature 0 +60 °C	scanning range far limit Sde	30 200 mm
response time ton < 35 ms release time toff < 35 ms temperature drift < 2 % of distance to target So sonic frequency 380 kHz adjustment Teach-in alignment aid target indication flashing light indicator yellow LED / red LED  electrical data voltage supply range +Vs 15 30 VDC current consumption max. (no load) output circuit voltage output output signal 0 10 V / 10 0 V output current < 15 mA residual ripple < 10 % Vs short circuit protection yes mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 55 mm depth 24,5 mm ambient conditions operating temperature 0 +60 °C	repeat accuracy	< 0,5 mm
release time toff  temperature drift  < 2 % of distance to target So sonic frequency  adjustment  alignment aid  light indicator  electrical data  voltage supply range +Vs  current consumption max. (no load)  output circuit  output signal  output current  residual ripple  short circuit protection  reverse polarity protection  mechanical data  type  rectangular  housing material  pa 12  width / diameter  height / length  depth  ambient conditions  operating temperature  380 kHz  180 ms  42 % of distance to target So  835 ms  42 % of distance to target So  830 kHz  23 ms  42 % of distance to target So  830 kHz  1830 vDC  1840 LED  185 30 VDC  35 mA  35 mA  35 mA  36 mA  37 mA  38 mA  39 voltage output  30 10 V / 10 0 V  41	resolution	< 0,3 mm
temperature drift < 2 % of distance to target So sonic frequency 380 kHz adjustment Teach-in alignment aid target indication flashing light indicator yellow LED / red LED  electrical data voltage supply range +Vs 15 30 VDC current consumption max. (no load) output circuit voltage output output signal 0 10 V / 10 0 V output current < 15 mA residual ripple < 10 % Vs short circuit protection yes mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 55 mm ambient conditions operating temperature 0 +60 °C	response time ton	< 35 ms
sonic frequency adjustment Teach-in alignment aid light indicator electrical data voltage supply range +Vs current consumption max. (no load) output circuit output signal output current residual ripple short circuit protection reverse polarity protection mechanical data type rectangular housing material place width / diameter height / length depth ambient conditions operating temperature  7	release time toff	< 35 ms
adjustment alignment aid target indication flashing light indicator  electrical data  voltage supply range +Vs current consumption max. (no load) output circuit output signal output current residual ripple short circuit protection reverse polarity protection mechanical data type rectangular housing material plant pla	temperature drift	< 2 % of distance to target So
alignment aid target indication flashing light indicator yellow LED / red LED  electrical data voltage supply range +Vs 15 30 VDC current consumption max. (no load) output circuit voltage output output signal 0 10 V / 10 0 V output current < 15 mA residual ripple < 10 % Vs short circuit protection yes reverse polarity protection yes mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 55 mm depth 24,5 mm ambient conditions operating temperature 0 +60 °C	sonic frequency	380 kHz
light indicator yellow LED / red LED  electrical data  voltage supply range +Vs 15 30 VDC  current consumption max. (no load)  output circuit voltage output  output signal 0 10 V / 10 0 V  output current < 15 mA  residual ripple < 10 % Vs  short circuit protection yes  reverse polarity protection yes  mechanical data  type rectangular  housing material PA 12  width / diameter 8,6 mm  height / length 55 mm  depth 24,5 mm  ambient conditions  operating temperature 0 +60 °C	adjustment	Teach-in
voltage supply range +Vs 15 30 VDC current consumption max. (no load) output circuit voltage output output signal 0 10 V / 10 0 V output current < 15 mA residual ripple < 10 % Vs short circuit protection yes reverse polarity protection yes mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 55 mm depth 24,5 mm ambient conditions operating temperature 0 +60 °C	alignment aid	target indication flashing
voltage supply range +Vs 15 30 VDC current consumption max. (no load) output circuit voltage output output signal 0 10 V / 10 0 V output current < 15 mA residual ripple < 10 % Vs short circuit protection yes reverse polarity protection yes mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 55 mm depth 24,5 mm ambient conditions operating temperature 0 +60 °C	light indicator	yellow LED / red LED
current consumption max. (no load)  output circuit  output signal  output current  < 15 mA  residual ripple  short circuit protection  reverse polarity protection  mechanical data  type  rectangular  housing material  pA 12  width / diameter  height / length  depth  ambient conditions  operating temperature  35 mA  36 mA  98 vs  vs  vs  vs  residual ripple  < 10 % Vs  yes  rectangular  PA 12  8,6 mm  49,5 mm  ambient conditions  operating temperature  0 +60 °C	electrical data	
load) output circuit voltage output output signal 0 10 V / 10 0 V output current < 15 mA residual ripple < 10 % Vs short circuit protection yes reverse polarity protection yes mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 55 mm depth 24,5 mm ambient conditions operating temperature 0 +60 °C	voltage supply range +Vs	15 30 VDC
output signal 0 10 V / 10 0 V output current < 15 mA residual ripple < 10 % Vs short circuit protection yes reverse polarity protection yes mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 55 mm depth 24,5 mm ambient conditions operating temperature 0 +60 °C	current consumption max. (no load)	35 mA
output current < 15 mA residual ripple < 10 % Vs short circuit protection yes reverse polarity protection yes  mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 55 mm depth 24,5 mm  ambient conditions operating temperature 0 +60 °C	output circuit	voltage output
residual ripple < 10 % Vs short circuit protection yes reverse polarity protection yes  mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 55 mm depth 24,5 mm  ambient conditions operating temperature 0 +60 °C	output signal	0 10 V / 10 0 V
short circuit protection yes reverse polarity protection yes mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 55 mm depth 24,5 mm ambient conditions operating temperature 0 +60 °C	output current	< 15 mA
reverse polarity protection yes  mechanical data  type rectangular  housing material PA 12  width / diameter 8,6 mm  height / length 55 mm  depth 24,5 mm  ambient conditions  operating temperature 0 +60 °C	residual ripple	< 10 % Vs
mechanical data type rectangular housing material PA 12 width / diameter 8,6 mm height / length 55 mm depth 24,5 mm ambient conditions operating temperature 0 +60 °C	short circuit protection	yes
type rectangular housing material PA 12 width / diameter 8,6 mm height / length 55 mm depth 24,5 mm  ambient conditions operating temperature 0 +60 °C	reverse polarity protection	yes
housing material PA 12 width / diameter 8,6 mm height / length 55 mm depth 24,5 mm ambient conditions operating temperature 0 +60 °C	mechanical data	
width / diameter 8,6 mm height / length 55 mm depth 24,5 mm  ambient conditions operating temperature 0 +60 °C	type	rectangular
height / length 55 mm  depth 24,5 mm  ambient conditions operating temperature 0 +60 °C	housing material	PA 12
depth 24,5 mm  ambient conditions operating temperature 0 +60 °C	width / diameter	8,6 mm
ambient conditions operating temperature 0 +60 °C	height / length	55 mm
operating temperature 0 +60 °C	depth	24,5 mm
	ambient conditions	
protection class IP 67	operating temperature	0 +60 °C
	protection class	IP 67

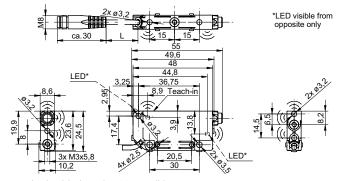
order reference	connection types
UNCK 09U6914	cable PUR 4 x 0,08, 2 m
UNCK 09U6914/KS35A	flylead connector M8, L=200 mm



#### dimension drawing

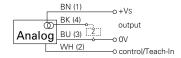


#### flylead connector version

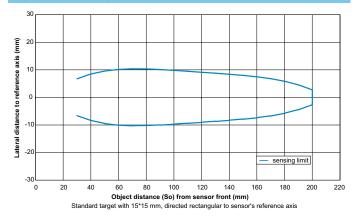


standard cable length 200 mm (L)

#### connection diagram



#### typical sonic cone profile



#### connectors and mating connectors

Connector M8, 4 pin, straight, 2 m, shielded ESW 31AH0200G Connector M8, 4 pin, angular, 2 m, shielded additional cable connectors and field wireable connectors: see accessories

92

## **IO**-Link

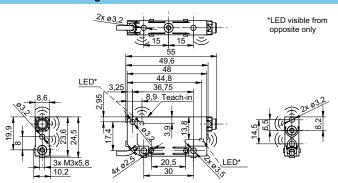
- IO-Link
- short response time
- high resolution

general data	
scanning range Sd	30 200 mm
scanning range close limit Sdc	30 200 mm
scanning range far limit Sde	30 200 mm
repeat accuracy	< 0,5 mm
repeat accuracy (filter active)	< 0,1 mm
resolution	< 0,3 mm
resolution (filter active)	< 0,1 mm
response time ton	< 7 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	Teach-in and IO-Link
alignment aid	target indication flashing
light indicator	green LED / red LED
electrical data	
voltage supply range +Vs	18 30 VDC
current consumption max. (no load)	35 mA
output circuit	push-pull / IO-Link
baud rate	38400
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	55 mm
depth	24,5 mm
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67

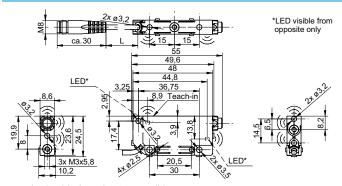
order reference	connection types
UNCK 09G8914/IO	cable PUR 4 x 0,08, 2 m
UNCK 09G8914/KS35A/IO	flylead connector M8, L=200 mm



#### dimension drawing

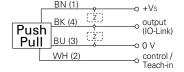


#### flylead connector version

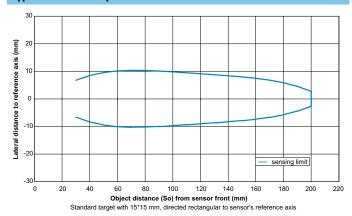


standard cable length 200 mm (L)

#### connection diagram



#### typical sonic cone profile



#### connectors and mating connectors

ESG 32AH0200G Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories

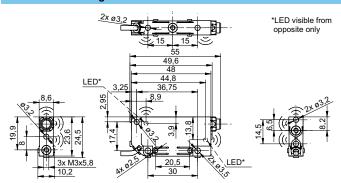
- serial interface RS 232
- high resolution
- short response time

general data	
scanning range Sd	30 200 mm
scanning range close limit Sdc	30 200 mm
scanning range far limit Sde	30 200 mm
repeat accuracy	< 0,5 mm
repeat accuracy (filter active)	< 0,1 mm
resolution	< 0,3 mm
resolution (filter active)	< 0,1 mm
response time ton	< 7 ms
temperature drift	< 0,18 % Sde/K (comp. off, factory set) < 2 % So (compensation on)
sonic frequency	380 kHz
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 30 VDC
current consumption max. (no load)	35 mA
output circuit	RS 232
baud rate	115200
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes, Vs to GND
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	55 mm
depth	24,5 mm
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67

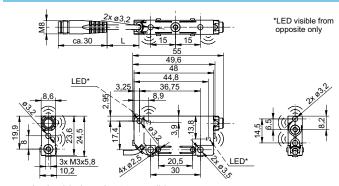
order reference	connection types
UNCK 09T9114	cable PUR 4 x 0,08, 2 m
UNCK 09T9114/KS35A	flylead connector M8, L=200 mm



#### dimension drawing

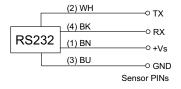


#### flylead connector version

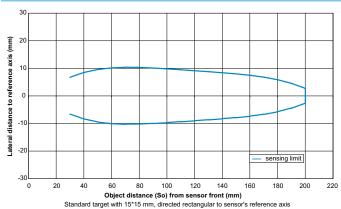


standard cable length 200 mm (L)

#### connection diagram



#### typical sonic cone profile



#### connectors and mating connectors

ESG 32AH0200G Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories

94

### Sd = 150 mm

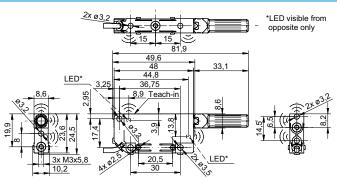
- measurement in very small containers
- stackability in a 9 mm pitch
- short response time

general data	
scanning range Sd	3 150 mm
scanning range close limit Sdc	3 150 mm
scanning range far limit Sde	3 150 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 35 ms
release time toff	< 35 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 30 VDC
current consumption max. (no load)	35 mA
output circuit	voltage output
output signal	0 10 V / 10 0 V
output current	< 15 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
material (beam columnator)	POM
width / diameter	8,6 mm
height / length	82 mm
depth	24,5 mm
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67

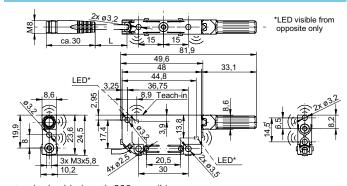
order reference	connection types
UNCK 09U6914/D1	cable PUR 4 x 0,08, 2 m
UNCK 09U6914/KS35AD1	flylead connector M8, L=200 mm



#### dimension drawing

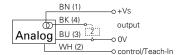


#### flylead connector version

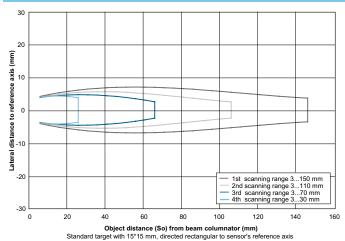


standard cable length 200 mm (L)

#### connection diagram



#### typical sonic cone profile



#### connectors and mating connectors

ESG 32AH0200G Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories

### Sd = 150 mm

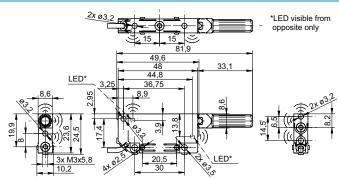
- serial interface RS 232
- measurement in very small containers
- high resolution

general data	0 150
scanning range Sd	3 150 mm
scanning range close limit Sdc	3 150 mm
scanning range far limit Sde	3 150 mm
repeat accuracy	< 0,5 mm
repeat accuracy (filter active)	< 0,1 mm
resolution	< 0,3 mm
resolution (filter active)	< 0,1 mm
response time ton	< 7 ms
temperature drift	< 0,18 % Sde/K (comp. off, factory set) < 2 % So (compensation on)
sonic frequency	380 kHz
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 30 VDC
current consumption max. (no load)	35 mA
output circuit	RS 232
baud rate	115200
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes, Vs to GND
mechanical data	
type	rectangular
housing material	PA 12
material (beam columnator)	POM
width / diameter	8,6 mm
height / length	82 mm
depth	24,5 mm
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67

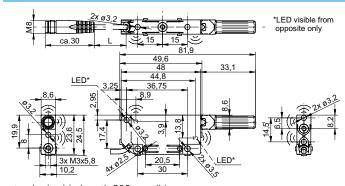
order reference	connection types
UNCK 09T9114/D1	cable PUR 4 x 0,08, 2 m
UNCK 09T9114/KS35AD1	flylead connector M8, L=200 mm



#### dimension drawing

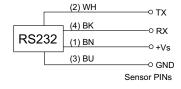


#### flylead connector version



standard cable length 200 mm (L)

#### connection diagram



typical sonic cone profile

Object distance (So) from beam columnator (mm)
Standard target with 15\*15 mm, directed rectangular to sensor's reference axis

#### connectors and mating connectors

ESG 32AH0200G Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see
accessories

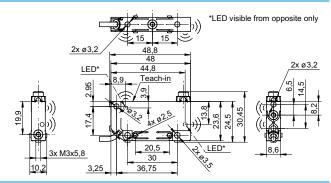
- short response time
- internal and external Teach-in
- detects the smallest objects

general data	
	20 200
scanning range Sd	30 200 mm
scanning range close limit Sdc	30 200 mm
scanning range far limit Sde	30 200 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 35 ms
release time toff	< 35 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 30 VDC
current consumption max. (no load)	35 mA
output circuit	voltage output
output signal	0 10 V / 10 0 V
output current	< 15 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	48,8 mm
depth	30,5 mm
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67

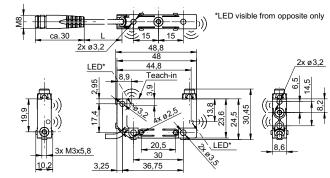
order reference	connection types
UNDK 09U6914	cable PUR 4 x 0,08, 2 m
UNDK 09U6914/KS35A	flylead connector M8, L=200 mm



#### dimension drawing

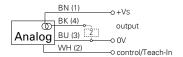


#### flylead connector version

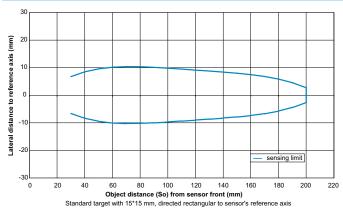


standard cable length 200 mm (L)

#### connection diagram



#### typical sonic cone profile



#### connectors and mating connectors

ESG 32AH0200G Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories

#### Sd = 200 mm

## **IO**-Link

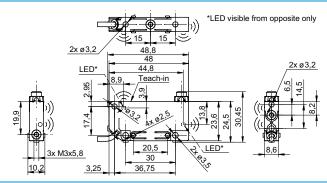
- IO-Link
- short response time
- high resolution

general data	
scanning range Sd	30 200 mm
scanning range close limit Sdc	30 200 mm
scanning range far limit Sde	30 200 mm
repeat accuracy	< 0,5 mm
repeat accuracy (filter active)	< 0,1 mm
resolution	< 0,3 mm
resolution (filter active)	< 0,1 mm
response time ton	< 7 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	Teach-in and IO-Link
alignment aid	target indication flashing
light indicator	green LED / red LED
electrical data	
voltage supply range +Vs	18 30 VDC
current consumption max. (no load)	35 mA
output circuit	push-pull / IO-Link
baud rate	38400
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	48,8 mm
depth	30,5 mm
ambient conditions	
operating temperature	0 +60 °C
operating temperature	

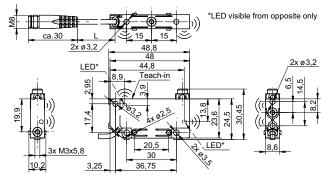
order reference	connection types
UNDK 09G8914/IO	cable PUR 4 x 0,08, 2 m
UNDK 09G8914/KS35A/IO	flylead connector M8, L=200 mm



#### dimension drawing

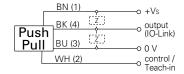


#### flylead connector version

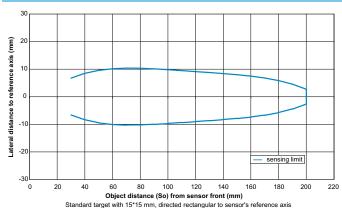


standard cable length 200 mm (L)

#### connection diagram



#### typical sonic cone profile



#### connectors and mating connectors

ESG 32AH0200G Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories

98

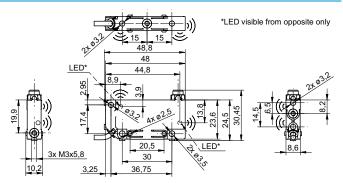
- serial interface RS 232
- high resolution
- short response time

general data	
scanning range Sd	30 200 mm
scanning range close limit Sdc	30 200 mm
scanning range far limit Sde	30 200 mm
repeat accuracy	< 0,5 mm
repeat accuracy (filter active)	< 0,1 mm
resolution	< 0,3 mm
resolution (filter active)	< 0,1 mm
response time ton	< 7 ms
temperature drift	< 0,18 % Sde/K (comp. off, factory set) < 2 % So (compensation on)
sonic frequency	380 kHz
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 30 VDC
current consumption max. (no load)	35 mA
output circuit	RS 232
baud rate	115200
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes, Vs to GND
mechanical data	
type	rectangular
housing material	PA 12
width / diameter	8,6 mm
height / length	48,8 mm
depth	30,5 mm
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67

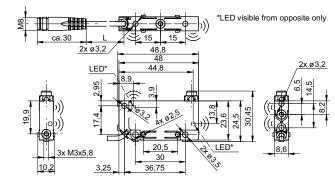
order reference	connection types
UNDK 09T9114	cable PUR 4 x 0,08, 2 m
UNDK 09T9114/KS35A	flylead connector M8   =200 mm



#### dimension drawing

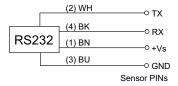


#### flylead connector version

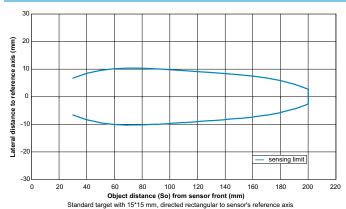


standard cable length 200 mm (L)

#### connection diagram



#### typical sonic cone profile



#### connectors and mating connectors

ESG 32AH0200G Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories

Sd = 150 mm



### Sd = 150 mm

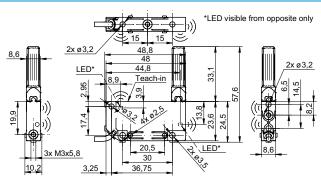
- measurement in very small containers
- stackability in a 9 mm pitch
- short response time

general data scanning range Sd 3 150 mm scanning range close limit Sdc 3 150 mm scanning range far limit Sde 3 150 mm scanning range far limit Sde 3 150 mm sepent accuracy < 0,5 mm sepont time ton < 35 ms selease time toff < 35 ms semperature drift < 2 % of distance to target So sonic frequency 380 kHz scanic frequency 380 kHz s
scanning range close limit Sdc 3 150 mm  scanning range far limit Sde 3 150 mm  seperat accuracy < 0,5 mm  sesponse time ton < 35 ms  selease time toff < 35 ms  semperature drift < 2 % of distance to target So sonic frequency 380 kHz  adjustment Teach-in target indication flashing sight indicator yellow LED / red LED  selectrical data  voltage supply range +Vs 15 30 VDC surrent consumption max. (no odd) soutput circuit voltage output
scanning range far limit Sde 3 150 mm  repeat accuracy < 0,5 mm  response time ton < 35 ms  release time toff < 35 ms  release time toff < 2 % of distance to target So  sonic frequency 380 kHz  reach-in  alignment aid target indication flashing  right indicator yellow LED / red LED  relectrical data  roltage supply range +Vs  current consumption max. (no  coad)  rottored in to the control of the control
repeat accuracy < 0,5 mm resolution < 0,3 mm response time ton < 35 ms release time toff < 35 ms release time toff < 2 % of distance to target So remperature drift < 2 % of distance to target So remperature drift Teach-in relignment aid target indication flashing right indicator yellow LED / red LED relectrical data roltage supply range +Vs 15 30 VDC recurrent consumption max. (no odd) routput circuit voltage output
resolution < 0,3 mm  esponse time ton < 35 ms  release time toff < 35 ms  remperature drift < 2 % of distance to target So  sonic frequency 380 kHz  reach-in alignment aid target indication flashing right indicator yellow LED / red LED  relectrical data  voltage supply range +Vs 15 30 VDC  surrent consumption max. (no odd)  routput circuit voltage output
response time ton < 35 ms  release time toff < 35 ms  remperature drift < 2 % of distance to target So  sonic frequency 380 kHz  redijustment Teach-in  alignment aid target indication flashing  right indicator yellow LED / red LED  relectrical data  roltage supply range +Vs 15 30 VDC  surrent consumption max. (no odd)  routput circuit voltage output
release time toff < 35 ms remperature drift < 2 % of distance to target So sonic frequency 380 kHz redijustment Teach-in relignment aid target indication flashing right indicator yellow LED / red LED relectrical data roltage supply range +Vs 15 30 VDC resurrent consumption max. (no odd) routput circuit voltage output
semperature drift < 2 % of distance to target So sonic frequency 380 kHz  Teach-in slignment aid target indication flashing ight indicator yellow LED / red LED  selectrical data voltage supply range +Vs 15 30 VDC surrent consumption max. (no oad) voltage output
sonic frequency  adjustment  Teach-in  alignment aid  target indication flashing  yellow LED / red LED  plectrical data  yoltage supply range +Vs  current consumption max. (no odd)  putput circuit  Teach-in  target indication flashing  yellow LED / red LED  35 mA
adjustment  Teach-in  alignment aid  target indication flashing  yellow LED / red LED  plectrical data  yoltage supply range +Vs  current consumption max. (no odd)  putput circuit  Teach-in  target indication flashing  yellow LED / red LED  35 mA  35 mA
alignment aid target indication flashing ight indicator yellow LED / red LED  electrical data  voltage supply range +Vs 15 30 VDC  current consumption max. (no oad)  output circuit voltage output
ight indicator yellow LED / red LED  electrical data  voltage supply range +Vs 15 30 VDC  current consumption max. (no oad)  output circuit voltage output
pelectrical data  voltage supply range +Vs
corrent consumption max. (no ad)  butput circuit  15 30 VDC  35 mA  voltage output
oad) output circuit  35 mA voltage output
oad) output circuit voltage output
output signal 0 10 V / 10 0 V
output current < 15 mA
residual ripple < 10 % Vs
short circuit protection yes
everse polarity protection yes
mechanical data
ype rectangular
nousing material PA 12
material (beam columnator) POM
vidth / diameter 8,6 mm
neight / length 48,8 mm
depth 57,7 mm
ambient conditions
operating temperature 0 +60 °C
protection class IP 67

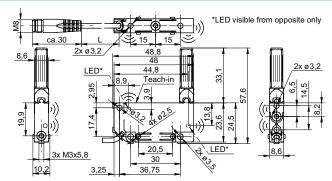
order reference	connection types
UNDK 09U6914/D1	cable PUR 4 x 0,08, 2 m
UNDK 09U6914/KS35AD1	flylead connector M8, L=200 mm



#### dimension drawing

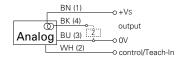


#### flylead connector version

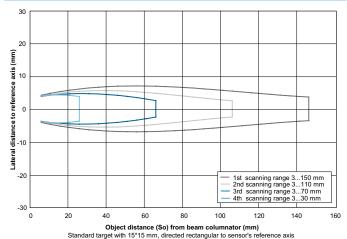


standard cable length 200 mm (L)

#### connection diagram



#### typical sonic cone profile



#### connectors and mating connectors

ESG 32AH0200G Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories

#### Sd = 150 mm

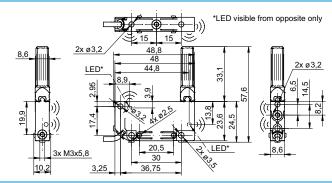
- serial interface RS 232
- measurement in very small containers
- high resolution

general data	
scanning range Sd	3 150 mm
scanning range close limit Sdc	3 150 mm
scanning range far limit Sde	3 150 mm
repeat accuracy	< 0,5 mm
repeat accuracy (filter active)	< 0,1 mm
resolution	< 0,3 mm
resolution (filter active)	< 0,1 mm
response time ton	< 7 ms
temperature drift	< 0,18 % Sde/K (comp. off, factory set) < 2 % So (compensation on)
sonic frequency	380 kHz
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 30 VDC
current consumption max. (no load)	35 mA
output circuit	RS 232
baud rate	115200
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes, Vs to GND
mechanical data	
type	rectangular
housing material	PA 12
material (beam columnator)	POM
width / diameter	8,6 mm
height / length	48,8 mm
depth	57,7 mm
ambient conditions	
operating temperature	0 +60 °C
protection class	IP 67

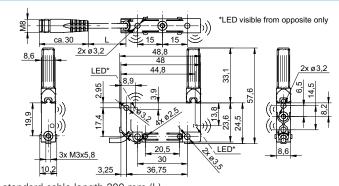
order reference	connection types
UNDK 09T9114/D1	cable PUR 4 x 0,08, 2 m
UNDK 09T9114/KS35AD1	flylead connector M8, L=200 mm



#### dimension drawing

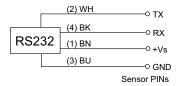


#### flylead connector version

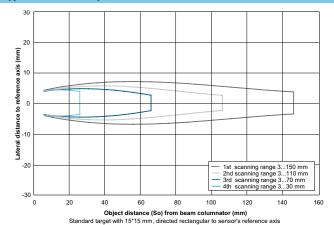


standard cable length 200 mm (L)

#### connection diagram



#### typical sonic cone profile



#### connectors and mating connectors

ESG 32AH0200G Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories

- compact housing
- very low mass (4 g)
- high resolution

general data	00 000
scanning range Sd	20 200 mm
scanning range close limit Sdc	20 200 mm
scanning range far limit Sde	20 200 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 60 ms
release time toff	< 60 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 30 VDC
current consumption max. (no load)	35 mA
output circuit	voltage output
output signal	0 10 V / 10 0 V
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	rectangular
housing material	plastic (ASA)
width / diameter	10,4 mm
height / length	27 mm
depth	14 mm
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

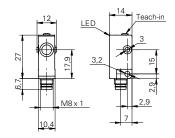
order reference	connection types
UNDK 10U6914	cable PUR 4 x 0,08, 2 m
UNDK 10U6914/KS35A	flylead connector M8, L=200 mm
UNDK 10U6914/S35A	connector M8

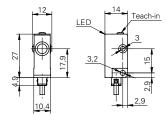




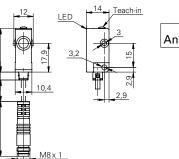
#### dimension drawings

**SONUS** 

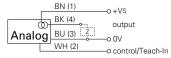




#### flylead connector version

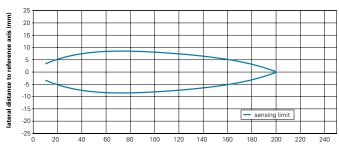


#### connection diagram



standard cable length 200 mm (L)

## typical sonic cone profile



object distance (So) from sensor front (mm)

standard square target, size 15 x 15 mm, positioned perpendicularly to sensor's reference axis

#### connectors and mating connectors

ESG 32AH0200G Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see
accessories

Accessories	
10150326	Sensofix series 10 / series 20
10133792	Mounting bracket series 10 (L design)
10114501	Mounting bracket series 10 (U design)
10162083	Mounting panel for sensors series 10
10118798	Mounting bracket series 10
10162376	Sonic beam deflector for ultrasonic sensors series 10
for detailer acc	

for details: see accessories section

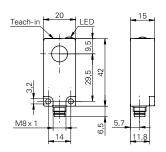
- internal and external Teach-in
- 0 ... 10 V / 4 ... 20 mA invertible
- small sonic beam angle

general data	
scanning range Sd	20 200 mm
scanning range close limit Sdc	20 200 mm
scanning range far limit Sde	20 200 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 30 ms
release time toff	< 30 ms
temperature drift	< 2 % of distance to target So
<u> </u>	380 kHz
sonic frequency	Teach-in
adjustment	
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	45 00 \ (D.0
voltage supply range +Vs	15 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
output signal	0 10 V / 10 0 V
current output	
current consumption max. (no load)	55 mA
output signal	
output digital	4 20 mA / 20 4 mA
load resistance +Vs max.	4 20 mA / 20 4 mA < 1100 Ohm
	· · · · · · · · · · · · · · · · · · ·
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs max. load resistance +Vs min. mechanical data	< 1100 Ohm < 400 Ohm
load resistance +Vs max. load resistance +Vs min. mechanical data type	< 1100 Ohm < 400 Ohm rectangular
load resistance +Vs max. load resistance +Vs min. mechanical data type housing material	< 1100 Ohm < 400 Ohm rectangular polyester
load resistance +Vs max. load resistance +Vs min. mechanical data type housing material width / diameter	< 1100 Ohm < 400 Ohm  rectangular polyester 20 mm
load resistance +Vs max. load resistance +Vs min. mechanical data type housing material width / diameter height / length	< 1100 Ohm < 400 Ohm  rectangular polyester 20 mm 42 mm
load resistance +Vs max. load resistance +Vs min. mechanical data type housing material width / diameter height / length depth	< 1100 Ohm < 400 Ohm  rectangular polyester 20 mm 42 mm 15 mm
load resistance +Vs max. load resistance +Vs min. mechanical data type housing material width / diameter height / length depth connection types	< 1100 Ohm < 400 Ohm  rectangular polyester 20 mm 42 mm 15 mm
load resistance +Vs max. load resistance +Vs min. mechanical data type housing material width / diameter height / length depth connection types ambient conditions	< 1100 Ohm < 400 Ohm  rectangular polyester 20 mm 42 mm 15 mm connector M8

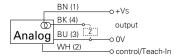
order reference	output circuit
UNDK 2016914/S35A	current output
UNDK 20U6914/S35A	voltage output



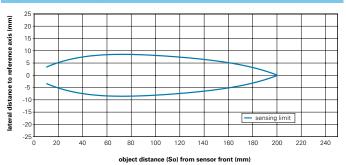
#### dimension drawing



#### connection diagram



#### typical sonic cone profile



standard square target, size 15 x 15 mm, positioned perpendicularly to sensor's reference axis

#### connectors and mating connectors

ESG 32AH0200G Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see
accessories

Accessories		
10150326	Sensofix series 10 / series 20	
10153290	Sonic beam deflector series 20	
for details: see accessories section		

UNDK 20 Sd = 400 mm

# Ultrasonic distance sensors

### Sd = 400 mm

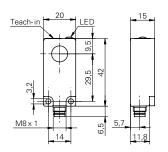
- internal and external Teach-in
- 0 ... 10 V / 4 ... 20 mA invertible
- wide sonic beam angle

general data	
scanning range Sd	60 400 mm
scanning range close limit Sdc	60 400 mm
scanning range far limit Sde	60 400 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 60 ms
release time toff	< 60 ms
temperature drift	< 2 % of distance to target So
sonic frequency	290 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
output signal	0 10 V / 10 0 V
current output	
current consumption max. (no load)	55 mA
output signal	4 20 mA / 20 4 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
width / diameter height / length	20 mm 42 mm
height / length	42 mm
height / length depth	42 mm 15 mm
height / length depth connection types	42 mm 15 mm
height / length depth connection types ambient conditions	42 mm 15 mm connector M8

order reference	output circuit
UNDK 2016912/S35A	current output
UNDK 20U6912/S35A	voltage output



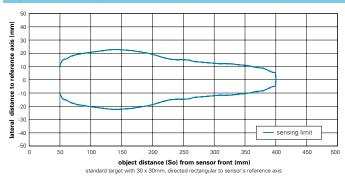
#### dimension drawing



#### connection diagram



#### typical sonic cone profile



#### connectors and mating connectors

ESG 32AH0200G Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories

Accessories	
10150326	Sensofix series 10 / series 20
10153290	Sonic beam deflector series 20

for details: see accessories section

### Sd = 1000 mm

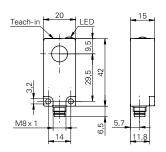
- internal and external Teach-in
- 0 ... 10 V / 4 ... 20 mA invertible
- long sensing range

general data	
scanning range Sd	100 1000 mm
scanning range close limit Sdc	100 1000 mm
scanning range far limit Sde	100 1000 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 80 ms
release time toff	< 80 ms
temperature drift	< 2 % of distance to target So
sonic frequency	240 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
output signal	0 10 V / 10 0 V
current output	
current consumption max. (no load)	55 mA
output signal	4 20 mA / 20 4 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	rectangular
housing material	polyester
width / diameter	20 mm
height / length	42 mm
depth	15 mm
connection types	connector M8
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

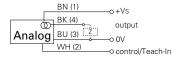
order reference	output circuit
UNDK 2016903/S35A	current output
UNDK 20U6903/S35A	voltage output



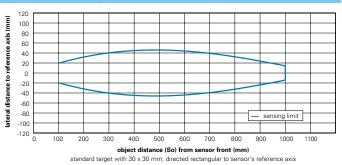
#### dimension drawing



#### connection diagram



#### typical sonic cone profile



#### connectors and mating connectors

ESG 32AH0200G Connector M8, 4 pin, straight, 2 m, shielded
ESW 31AH0200G Connector M8, 4 pin, angular, 2 m, shielded
additional cable connectors and field wireable connectors: see accessories

Accessories		
10150326	Sensofix series 10 / series 20	
10153290	Sonic beam deflector series 20	
for details: see accessories section		

UNDK 30 Sd = 250 mm

### Sd = 250 mm

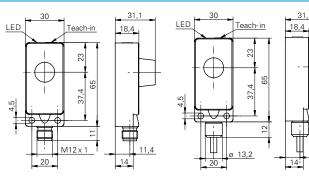
- Teach-in or potentiometer
- 0 ... 10 V / 4 ... 20 mA
- signals of Teach-in version invertible

general data	
scanning range Sd	30 250 mm
scanning range far limit Sde	30 250 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 50 ms
release time toff	< 50 ms
temperature drift	< 2 % of distance to target So
sonic frequency	300 kHz
alignment aid	target indication flashing
potentiometer	
light indicator	LED green
Teach-in	
scanning range close limit Sdc	30 250 mm
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
current output	
current consumption max. (no load)	55 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67



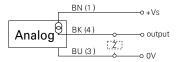


#### dimension drawings

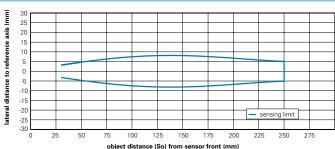


Teach-in = Teach-in or potentiometer

#### connection diagram



#### typical sonic cone profile



standard square target, size  $15 \times 15$  mm, positioned perpendicularly to sensor's reference axis

#### connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded additional cable connectors and field wireable connectors: see accessories

Accessories		
10152386	Sensofix series 30	
for details: see acc	essories section	

order reference	adjustment	output circuit	output signal	connection types
UNDK 30I6113	Teach-in	current output	4 20 mA / 20 4 mA	cable, 2 m
UNDK 30I6113/S14	Teach-in	current output	4 20 mA / 20 4 mA	connector M12
UNDK 30U6113	Teach-in	voltage output	0 10 V / 10 0 V	cable, 2 m
UNDK 30U6113/S14	Teach-in	voltage output	0 10 V / 10 0 V	connector M12
UNDK 30U9113	potentiometer	voltage output	0 10 VDC	cable, 2 m
UNDK 30U9113/S14	potentiometer	voltage output	0 10 VDC	connector M12

18,4

# Sd = 400 mm

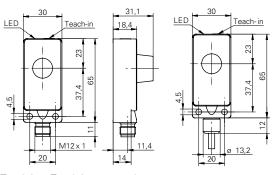
- Teach-in or potentiometer
- 0 ... 10 V / 4 ... 20 mA
- signals of Teach-in version invertible

general data	
scanning range Sd	60 400 mm
scanning range far limit Sde	60 400 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 60 ms
release time toff	< 60 ms
temperature drift	< 2 % of distance to target So
sonic frequency	400 kHz
alignment aid	target indication flashing
potentiometer	
light indicator	LED green
Teach-in	
scanning range close limit Sdc	60 400 mm
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
current output	
current consumption max. (no load)	55 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	rectangular
housing material	polyester / die-cast zinc
width / diameter	30 mm
height / length	65 mm
depth	31 mm
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67



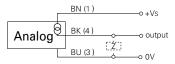


# dimension drawings

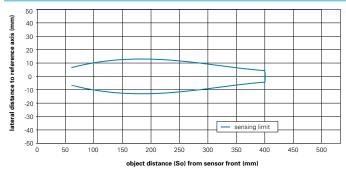


Teach-in = Teach-in or potentiometer

# connection diagram



# typical sonic cone profile



standard target with 30 x 30mm, directed rectangular to sensor's reference axis

# connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded additional cable connectors and field wireable connectors: see accessories

# Accessories

10152386	Sensofix series 30	
for details: see a	accessories section	

order reference	adjustment	output circuit	output signal	connection types
UNDK 30I6112	Teach-in	current output	4 20 mA / 20 4 mA	cable, 2 m
UNDK 30I6112/S14	Teach-in	current output	4 20 mA / 20 4 mA	connector M12
UNDK 30U6112	Teach-in	voltage output	0 10 V / 10 0 V	cable, 2 m
UNDK 30U6112/S14	Teach-in	voltage output	0 10 V / 10 0 V	connector M12
UNDK 30U9112	potentiometer	voltage output	0 10 VDC	cable, 2 m
UNDK 30U9112/S14	potentiometer	voltage output	0 10 VDC	connector M12

18,4

protection class

UNDK 30 Sd = 1000 mm



# Sd = 1000 mm

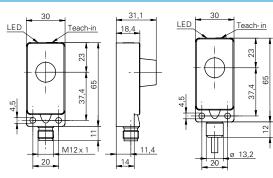
- Teach-in or potentiometer
- 0 ... 10 V / 4 ... 20 mA
- signals of Teach-in version invertible

general data		
scanning range Sd	100 1000 mm	
scanning range far limit Sde	100 1000 mm	
repeat accuracy	< 0,5 mm	
resolution	< 0,3 mm	
response time ton	< 80 ms	
release time toff	< 80 ms	
temperature drift	< 2 % of distance to target So	
sonic frequency	240 kHz	
alignment aid	target indication flashing	
potentiometer		
light indicator	LED green	
Teach-in		
scanning range close limit Sdc	100 1000 mm	
light indicator	yellow LED / red LED	
electrical data		
voltage supply range +Vs	15 30 VDC	
output current	< 20 mA	
residual ripple	< 10 % Vs	
short circuit protection	yes	
reverse polarity protection	yes	
voltage output		
current consumption max. (no load)	35 mA	
current output		
current consumption max. (no load)	55 mA	
load resistance +Vs max.	< 1100 Ohm	
load resistance +Vs min.	< 400 Ohm	
mechanical data		
type	rectangular	
housing material	polyester / die-cast zinc	
width / diameter	30 mm	
height / length	65 mm	
depth	31 mm	
ambient conditions		
operating temperature	-10 +60 °C	



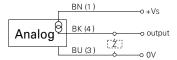


# dimension drawings

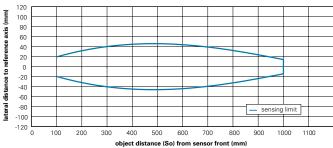


Teach-in = Teach-in or potentiometer

# connection diagram



# typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

# connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded additional cable connectors and field wireable connectors: see accessories

40003301103		
Accessories		
10152386	Sensofix series 30	
for details; and appropriate acction		

108 www.baumer.com

IP 67

order reference	adjustment	output circuit	output signal	connection types
UNDK 30I6103	Teach-in	current output	4 20 mA / 20 4 mA	cable, 2 m
UNDK 30I6103/S14	Teach-in	current output	4 20 mA / 20 4 mA	connector M12
UNDK 30U6103	Teach-in	voltage output	0 10 V / 10 0 V	cable, 2 m
UNDK 30U6103/S14	Teach-in	voltage output	0 10 V / 10 0 V	connector M12
UNDK 30U9103	potentiometer	voltage output	0 10 VDC	cable, 2 m
UNDK 30U9103/S14	potentiometer	voltage output	0 10 VDC	connector M12

protection class

U500.DA0 Sd = 1000 mm



# Sd = 1000 mm

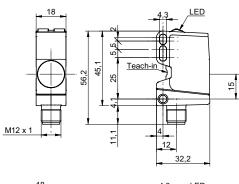
- short response time
- high resolution
- detects the smallest objects

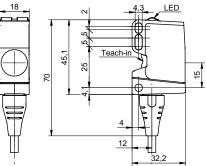
general data		
scanning range Sd	100 1000 mm	
scanning range close limit Sdc		
scanning range far limit Sde	100 1000 mm	
repeat accuracy	< 0,5 mm	
resolution	< 0,3 mm	
response time ton	< 80 ms	
release time toff	< 80 ms	
temperature drift	< 2 % of distance to target So	
power-up drift	compensated after 15 min.	
sonic frequency	220 kHz	
adjustment	qTeach	
alignment aid	light indicator flashing	
light indicator	LED yellow	
power on indication	LED green	
alignment measuring axis	< 2°	
electrical data		
voltage supply range +Vs	12 30 VDC	
current consumption typ.	38 mA	
residual ripple	< 10 % Vs	
short circuit protection	yes	
reverse polarity protection	yes, Vs to GND	
voltage - / current output		
output signal	4 20 mA / 0 10 VDC	
voltage output		
output signal	0 10 V / 10 0 V	
current output		
output signal	4 20 mA / 20 4 mA	
mechanical data		
type	rectangular	
housing material	plastic (ASA, PMMA)	
width / diameter	18 mm	
height / length	45 mm	
depth	32 mm	
ambient conditions		
storage temperature	-40 +75 °C	



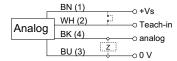


# dimension drawings

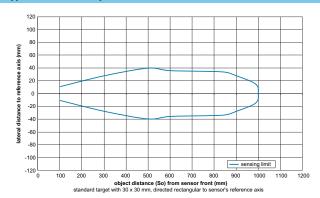




# connection diagram



# typical sonic cone profile



# connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded additional cable connectors and field wireable connectors: see accessories

Accessories			
11099942	Sensofix O500/U500		
11092246 Mounting bracket O500/U500 (L design)			
11111164 Mounting bracket O500/U500 - Retrofit for sensors series 30			
11111163 Sonic beam deflector for sensors U500			
for details: see ad	for details: see accessories section		

110 www.baumer.com

IP 67

order reference	output circuit	operating temperature	connection types
U500.DA0-11127346	voltage - / current output	-25 +65 °C (+60 °C current mode)	cable PUR 4 x 0,25, 2 m
U500.DA0-11110575	voltage - / current output	-25 +65 °C (+60 °C current mode)	connector M12
U500.DA0-11135757	current output	-25 +60 °C	cable PUR 4 x 0,25, 2 m
U500.DA0-11135756	current output	-25 +60 °C	connector M12
U500.DA0-11135772	voltage output	-25 +65 °C	cable PUR 4 x 0,25, 2 m
U500.DA0-11126857	voltage output	-25 +65 °C	connector M12

18,4

UNDK 30 Sd = 2000 mm

# Sd = 2000 mm

- Teach-in
- 0 ... 10 V / 4 ... 20 mA
- output signals invertible

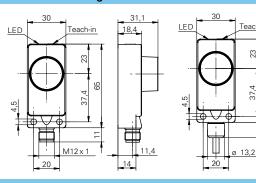
general data		
scanning range Sd	200 2000 mm	
scanning range close limit Sdc	200 2000 mm	
scanning range far limit Sde	200 2000 mm	
repeat accuracy	< 1 mm	
resolution	< 0,5 mm	
response time ton	< 150 ms	
release time toff	< 150 ms	
temperature drift	< 2 % of distance to target So	
sonic frequency	200 kHz	
adjustment	Teach-in	
alignment aid	target indication flashing	
light indicator	yellow LED / red LED	
electrical data		
voltage supply range +Vs	15 30 VDC	
output current	< 20 mA	
residual ripple	< 10 % Vs	
short circuit protection	yes	
reverse polarity protection	yes	
voltage output		
current consumption max. (no load)	35 mA	
output signal	0 10 V / 10 0 V	
current output		
current consumption max. (no load)	55 mA	
output signal	4 20 mA / 20 4 mA	
load resistance +Vs max.	< 1100 Ohm	
load resistance +Vs min.	< 400 Ohm	
mechanical data		
type	rectangular	
housing material	polyester / die-cast zinc	
width / diameter	30 mm	
height / length	65 mm	
depth	31 mm	
ambient conditions		
operating temperature	-10 +60 °C	
protection class	IP 67	

order reference	output circuit	connection types
UNDK 30I6104/S14	current output	connector M12
UNDK 30U6104	voltage output	cable, 2 m
UNDK 30U6104/S14	voltage output	connector M12

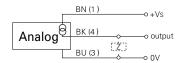




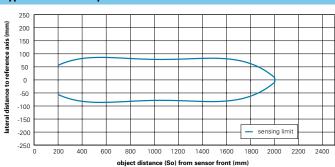
# dimension drawings



# connection diagram



# typical sonic cone profile



standard target with 100 x 100 mm, positioned perpendicularly to sensor's reference axis

# connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded additional cable connectors and field wireable connectors: see accessories

# **Accessories**

10152386	Sensofix series 30	
for details: see	accessories section	

112

# Sd = 82 mm

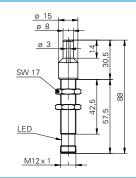
- external Teach-in
- with beam columnator for measurement in very small containers

general data	
scanning range Sd	2 82 mm
scanning range close limit Sdc	2 82 mm
scanning range far limit Sde	2 82 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 30 ms
release time toff	< 30 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 30 VDC
current consumption max. (no load)	35 mA
output circuit	voltage output
output signal	0 10 V / 10 0 V
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	88 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

order reference	
UNAM 12U9914/S14D	



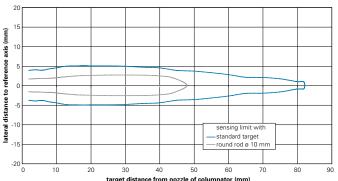
# dimension drawing



# connection diagram



# typical sonic cone profile



 $\frac{\text{target distance from nozzle of columnator (mm)}}{\text{standard target }15 \times 15 \text{ mm} \text{ and round rod } \emptyset \text{ }10 \text{ mm}, \text{ directecd rectangular to sensor's reference axis}$ 

# connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded additional cable connectors and field wireable connectors: see accessories

Accessories		
10151720	Sensofix series 12 round	
10141584 Teach-in Adapter M12		
for details: see accessories section		

UNAM 12 Sd = 200 mm

# • extern

# Sd = 200 mm

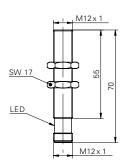
- external Teach-in
- 0 ... 10 V / 0 ... 10 mA invertible
- Teach-in adapter

general data	
scanning range Sd	20 200 mm
scanning range close limit Sdc	20 200 mm
scanning range far limit Sde	20 200 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 30 ms
release time toff	< 30 ms
temperature drift	< 2 % of distance to target So
sonic frequency	380 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
output signal	0 10 V / 10 0 V
current output	
current consumption max. (no load)	45 mA
output signal	0 10 mA / 10 0 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	70 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

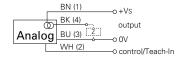
order reference	output circuit
UNAM 12I9914/S14	current output
UNAM 12U9914/S14	voltage output



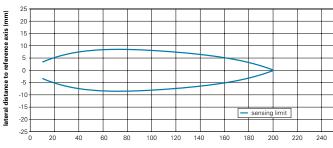
# dimension drawing



# connection diagram



# typical sonic cone profile



object distance (So) from sensor front (mm)

standard square target, size 15 x 15 mm, positioned perpendicularly to sensor's reference axis

# connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded additional cable connectors and field wireable connectors: see accessories

# Accessories

10151720	Sensofix series 12 round	
10141584	Teach-in Adapter M12	
6 1		

for details: see accessories section

# Sd = 400 mm

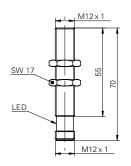
- external Teach-in
- 0 ... 10 V / 0 ... 10 mA invertible
- Teach-in adapter

general data	
scanning range Sd	60 400 mm
scanning range close limit Sdc	60 400 mm
scanning range far limit Sde	60 400 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 60 ms
release time toff	< 60 ms
temperature drift	< 2 % of distance to target So
sonic frequency	290 kHz
adjustment	external Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
output signal	0 10 V / 10 0 V
current output	
current consumption max. (no load)	45 mA
output signal	0 10 mA / 10 0 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	12 mm
height / length	70 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

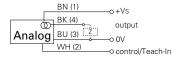
order reference	output circuit
UNAM 1219912/S14	current output
UNAM 12U9912/S14	voltage output



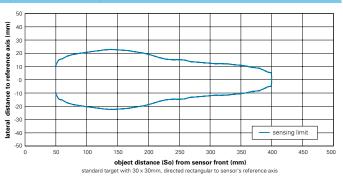
# dimension drawing



# connection diagram



# typical sonic cone profile



# connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded additional cable connectors and field wireable connectors: see accessories

# **Accessories** 10151720 Sensofix series 12 round 10141584 Teach-in Adapter M12

for details: see accessories section

UNAM 18 Sd = 1000 mm

# $Sd = 1000 \, mm$

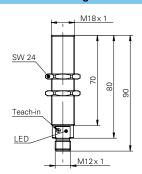
- internal and external Teach-in
- 0 ... 10 V / 4 ... 20 mA
- output signals invertible

general data	
scanning range Sd	100 1000 mm
scanning range close limit Sdc	100 1000 mm
scanning range far limit Sde	100 1000 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 80 ms
release time toff	< 80 ms
temperature drift	< 2 % of distance to target So
sonic frequency	240 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	
voltage supply range +Vs	15 30 VDC
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
current consumption max. (no load)	35 mA
output signal	0 10 V / 10 0 V
current output	
current consumption max. (no load)	55 mA
output signal	4 20 mA / 20 4 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	18 mm
height / length	90 mm
connection types	connector M12
ambient conditions	
operating temperature	-10 +60 °C
protection class	IP 67

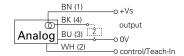
order reference	output circuit
UNAM 18I6903/S14	current output
UNAM 18U6903/S14	voltage output



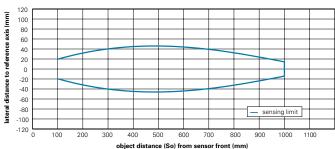
# dimension drawing



# connection diagram



# typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

# connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded additional cable connectors and field wireable connectors: see accessories

Accessories	
10151658	Sensofix series 18
ZADAP-M18.STANDARD	Mounting bracket series 18
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18
10164264	Sonic beam deflector series 18 rectangular
for details: see accessories section	

116 www.baumer.com



# Sd = 1000 mm

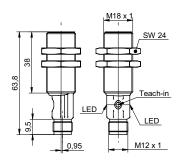
- short response time
- high resolution
- detects the smallest objects

general data	
scanning range Sd	100 1000 mm
scanning range close limit Sdc	100 1000 mm
scanning range far limit Sde	100 1000 mm
repeat accuracy	< 0,5 mm
resolution	< 0,3 mm
response time ton	< 80 ms
release time toff	< 80 ms
temperature drift	< 2 % of distance to target So
power-up drift	compensated after 10 min.
sonic frequency	220 kHz
adjustment	qTeach
alignment aid	light indicator flashing
light indicator	LED yellow
power on indication	LED green
alignment measuring axis	< 2°
electrical data	
voltage supply range +Vs	12 30 VDC
current consumption typ.	38 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes, Vs to GND
voltage output	
output signal	0 10 V / 10 0 V
current output	
output signal	4 20 mA / 20 4 mA
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated / TR90
width / diameter	18 mm
height / length	64 mm
connection types	connector M12
ambient conditions	
storage temperature	-40 +85 °C
protection class	IP 67

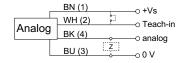
order reference	output circuit	operating temperature
UR18.DA0-11135775	current output	-25 +60 °C
UR18.DA0-11119994	voltage output	-25 +70 °C



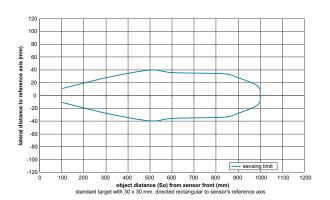
# dimension drawing



# connection diagram



# typical sonic cone profile



# connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded additional cable connectors and field wireable connectors: see accessories

Accessories		
10151658	Sensofix series 18	
ZADAP-M18.STANDARD	Mounting bracket series 18	
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)	
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)	
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18	
10164264	Sonic beam deflector series 18 rectangular	
for details: see accessories section		



# Sd = 400 mm

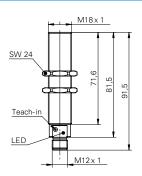
- internal and external Teach-in
- sensorfront chemically resistant
- stainless steel housing

general data		
special type	chemically resistant	
scanning range Sd	60 400 mm	
scanning range close limit Sdc	60 400 mm	
scanning range far limit Sde	60 400 mm	
repeat accuracy	< 0,5 mm	
resolution	< 0,3 mm	
response time ton	< 60 ms	
release time toff	< 60 ms	
temperature drift	< 2 % of distance to target So	
sonic frequency	400 kHz	
adjustment	Teach-in	
alignment aid	target indication flashing	
light indicator	yellow LED / red LED	
electrical data		
voltage supply range +Vs	15 30 VDC	
output current	< 20 mA	
residual ripple	< 10 % Vs	
short circuit protection	yes	
reverse polarity protection	yes	
voltage output		
current consumption max. (no load)	35 mA	
output signal	0 10 V / 10 0 V	
current output		
current consumption max. (no load)	55 mA	
output signal	4 20 mA / 20 4 mA	
load resistance +Vs max.	< 1100 Ohm	
load resistance +Vs min.	< 400 Ohm	
mechanical data		
type	cylindrical threaded	
housing material	stainless steel 1.4435 (V4A)	
coating active face	Parylene	
material O-ring	FFKM	
front of sensor durable against pressure	6 bar, 20'000 cycle	
width / diameter	18 mm	
height / length	91,5 mm	
connection types	connector M12	
ambient conditions		
operating temperature	0 +60 °C	
protection class	IP 67	

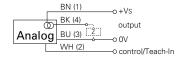
order reference	output circuit
UNAR 1816912/S14G	current output
UNAR 18U6912/S14G	voltage output



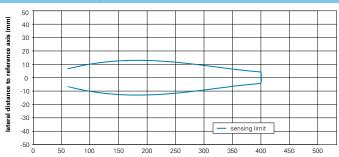
# dimension drawing



# connection diagram



# typical sonic cone profile



object distance (So) from sensor front (mm)

# connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded additional cable connectors and field wireable connectors: see accessories

Accessories		
10151658	Sensofix series 18	
ZADAP-M18.STANDARD	Mounting bracket series 18	
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)	
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)	
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18	
10164264	Sonic beam deflector series 18 rectangular	
for details: see accessories section		

118 www.baumer.com

# Sd = 1000 mm

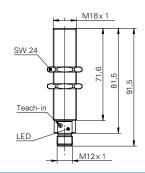
- internal and external Teach-in
- sensorfront chemically resistant
- stainless steel housing

general data		
	chomically registant	
special type scanning range Sd	chemically resistant 100 1000 mm	
scanning range close limit Sdc	100 1000 mm	
scanning range far limit Sde	100 1000 mm	
repeat accuracy	< 0,5 mm	
resolution	< 0,3 mm	
response time ton	< 80 ms	
release time toff	< 80 ms	
temperature drift	< 2 % of distance to target So	
sonic frequency	240 kHz	
adjustment	Teach-in	
alignment aid	target indication flashing	
light indicator	yellow LED / red LED	
electrical data		
voltage supply range +Vs	15 30 VDC	
output current	< 20 mA	
residual ripple	< 10 % Vs	
short circuit protection	yes	
reverse polarity protection	yes	
voltage output		
current consumption max. (no load)	35 mA	
output signal	0 10 V / 10 0 V	
current output		
current consumption max. (no load)	55 mA	
output signal	4 20 mA / 20 4 mA	
load resistance +Vs max.	< 1100 Ohm	
load resistance +Vs min.	< 400 Ohm	
mechanical data		
type	cylindrical threaded	
housing material	stainless steel 1.4435 (V4A)	
coating active face	Parylene	
material O-ring	FFKM	
front of sensor durable against pressure	6 bar, 20'000 cycle	
width / diameter	18 mm	
height / length	91,5 mm	
connection types	connector M12	
ambient conditions		
operating temperature	0 +60 °C	
protection class	IP 67	

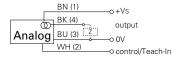
order reference	output circuit
UNAR 1816903/S14G	current output
UNAR 18U6903/S14G	voltage output



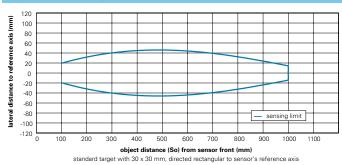
# dimension drawing



# connection diagram



# typical sonic cone profile



# connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded additional cable connectors and field wireable connectors: see accessories

Accessories		
10151658	Sensofix series 18	
ZADAP-M18.STANDARD	Mounting bracket series 18	
ZADAP-M18.SHORT	Mounting bracket short series 18 (L design)	
ZADAP-M18.LONG	Mounting bracket long series 18 (L design)	
ZADAP-M18.SWING	Mounting bracket for adjustment for sensors series 18	
10164264	Sonic beam deflector series 18 rectangular	
for details: see accessories section		

UNAM 30 Sd = 1000 mm

# Ultrasonic distance sensors

# Sd = 1000 mm

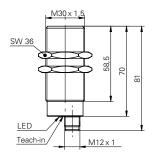
- Teach-in or potentiometer
- 0 ... 10 V / 4 ... 20 mA
- signals of Teach-in version invertible

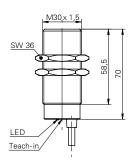
general data		
scanning range Sd	100 1000 mm	
scanning range far limit Sde	100 1000 mm	
repeat accuracy	< 0,5 mm	
resolution	< 0,3 mm	
response time ton	< 80 ms	
release time toff	< 80 ms	
temperature drift	< 2 % of distance to target So	
sonic frequency	240 kHz	
alignment aid	target indication flashing	
potentiometer		
light indicator	LED green	
Teach-in		
scanning range close limit Sdc	100 1000 mm	
light indicator	yellow LED / red LED	
electrical data		
voltage supply range +Vs	15 30 VDC	
output current	< 20 mA	
residual ripple	< 10 % Vs	
short circuit protection	yes	
reverse polarity protection	yes	
voltage output		
current consumption max. (no load)	35 mA	
current output		
current consumption max. (no load)	55 mA	
load resistance +Vs max.	< 1100 Ohm	
load resistance +Vs min.	< 400 Ohm	
mechanical data		
type	cylindrical threaded	
housing material	brass nickel plated	
width / diameter	30 mm	
height / length	70 mm	
ambient conditions		
operating temperature	-10 +60 °C	
protection class	IP 67	
	·	





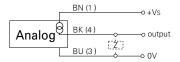
# dimension drawings



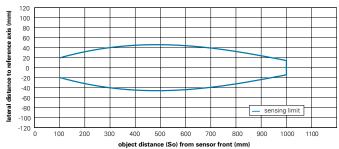


Teach-in = Teach-in or potentiometer

# connection diagram



# typical sonic cone profile



standard target with 30 x 30 mm, directed rectangular to sensor's reference axis

# connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded additional cable connectors and field wireable connectors: see accessories

order reference	version	adjustment	output circuit	output signal	connection types
UNAM 30I6103	standard	Teach-in	current output	4 20 mA / 20 4 mA	cable, 2 m
UNAM 30I6103/S14	standard	Teach-in	current output	4 20 mA / 20 4 mA	connector M12
UNAM 30I6803/S14	multiplex version	Teach-in	current output	4 20 mA / 20 4 mA	connector M12
UNAM 30U6103	standard	Teach-in	voltage output	0 10 V / 10 0 V	cable, 2 m
UNAM 30U6103/S14	standard	Teach-in	voltage output	0 10 V / 10 0 V	connector M12
UNAM 30U9103	standard	potentiometer	voltage output	0 10 VDC	cable, 2 m
UNAM 30U9103/S14	standard	potentiometer	voltage output	0 10 VDC	connector M12



# Sd = 2500 mm

- Teach-in or potentiometer
- 0 ... 10 V / 4 ... 20 mA
- signals of Teach-in version invertible

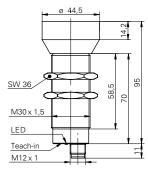
general data		
scanning range Sd	400 2500 mm	
scanning range close limit Sdc	400 2500 mm	
scanning range far limit Sde	400 2500 mm	
repeat accuracy	< 1 mm	
resolution	< 0,3 mm	
response time ton	< 160 ms	
release time toff	< 160 ms	
temperature drift	< 2 % of distance to target So	
sonic frequency	120 kHz	
adjustment	Teach-in	
alignment aid	target indication flashing	
light indicator	yellow LED / red LED	
electrical data		
voltage supply range +Vs	15 30 VDC	
output current	< 20 mA	
residual ripple	< 10 % Vs	
short circuit protection	yes	
reverse polarity protection	yes	
voltage output		
current consumption max. (no load)	35 mA	
output signal	0 10 V / 10 0 V	
current output		
current consumption max. (no load)	55 mA	
output signal	4 20 mA / 20 4 mA	
load resistance +Vs max.	< 1100 Ohm	
load resistance +Vs min.	< 400 Ohm	
mechanical data		
type	cylindrical threaded	
housing material	brass nickel plated	
width / diameter	30 mm	
height / length	95 mm	
ambient conditions		
operating temperature	-10 +60 °C	
protection class	IP 67	

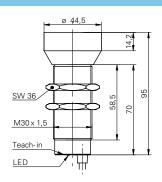
order reference	output circuit	connection types
UNAM 5016121	current output	cable, 2 m
UNAM 50I6121/S14	current output	connector M12
UNAM 50U6121	voltage output	cable, 2 m
UNAM 50U6121/S14	voltage output	connector M12





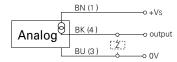
# dimension drawings



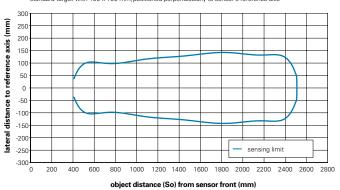


Teach-in = Teach-in or potentiometer

# connection diagram



# typical sonic cone profile



# connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded additional cable connectors and field wireable connectors: see accessories

UNAM 70 Sd = 6000 mm



# Sd = 6000 mm

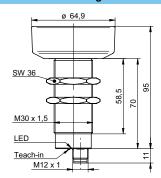
- Teach-in or potentiometer
- 0 ... 10 V / 4 ... 20 mA
- signals of Teach-in version invertible

general data	
scanning range Sd	600 6000 mm
scanning range close limit Sdc	600 6000 mm
scanning range far limit Sde	600 6000 mm
repeat accuracy	< 3 mm
resolution	< 2 mm
response time ton	< 640 ms
release time toff	< 640 ms
temperature drift	< 2 % of distance to target So
sonic frequency	80 kHz
adjustment	Teach-in
alignment aid	target indication flashing
light indicator	yellow LED / red LED
electrical data	yellow EED / Ted EED
voltage supply range +Vs	15 30 VDC
current consumption max. (no	35 mA
load)	55 IIIA
output current	< 20 mA
residual ripple	< 10 % Vs
short circuit protection	yes
reverse polarity protection	yes
voltage output	
output signal	0 10 V / 10 0 V
current output	
output signal	4 20 mA / 20 4 mA
load resistance +Vs max.	< 1100 Ohm
load resistance +Vs min.	< 400 Ohm
mechanical data	
type	cylindrical threaded
housing material	brass nickel plated
width / diameter	30 mm
height / length	95 mm
connection types	connector M12
ambient conditions	
operating temperature	-25 +60 °C
protection class	IP 67

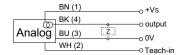
order reference	output circuit
UNAM 70I6131/S14	current output
UNAM 70U6131/S14	voltage output



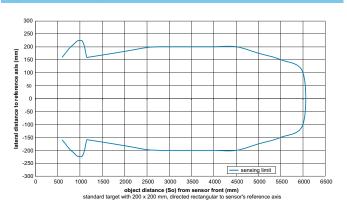
# dimension drawing



# connection diagram

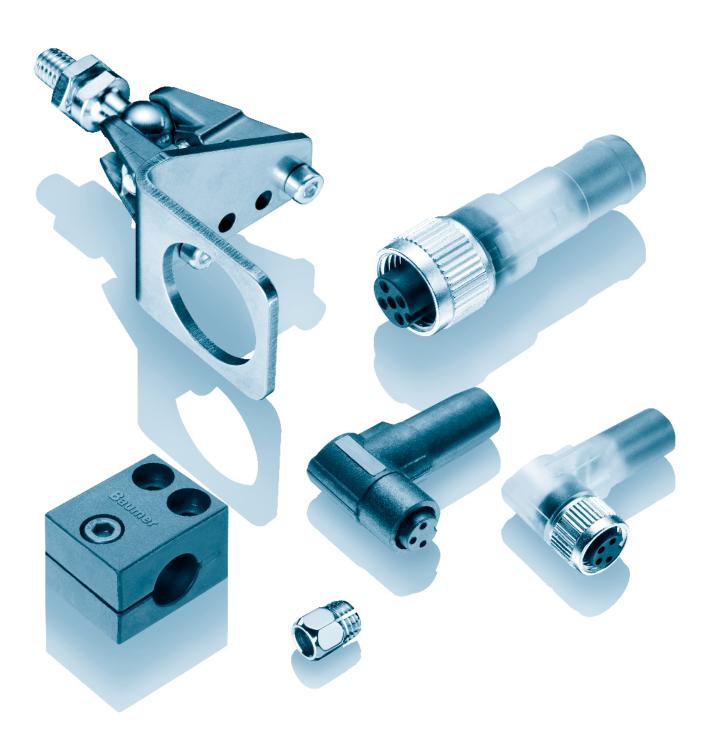


# typical sonic cone profile



# connectors and mating connectors

ESW 33AH0200G Connector M12, 4 pin, angular, 2 m, shielded additional cable connectors and field wireable connectors: see accessories



# Accessories

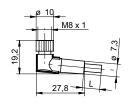
Connectors	Page 126
Connectors/Pin assignment	Page 130
Mounting accessories	Page 131
Mounting kits <b>SENSOFIX</b>	Page 133

Connectors

# Accessories

# ESW 31 - Connector M8 angular



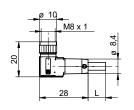


order reference	
ESW 31AH0200	Connector M8, 4 pin, angular, 2 m
ESW 31AH0500	Connector M8, 4 pin, angular, 5 m
ESW 31AH1000	Connector M8, 4 pin, angular, 10 m
ESW 31SH0200	Connector M8, 3 pin, angular, 2 m
ESW 31SH0500	Connector M8, 3 pin, angular, 5 m
ESW 31SH1000	Connector M8, 3 pin, angular, 10 m

- Connector unshielded
- 3 and 4 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836
- Meet EN 60079-25 requirements for intrinsically safe ATEX applications

ESW 31G - Connector M8 angular, shields	<b>ESW 31G</b>	- Connector	M8 angular,	shielded
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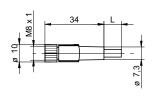


order reference	
ESW 31AH0200G	Connector M8, 4 pin, angular, 2 m, shielded
ESW 31AH0500G	Connector M8, 4 pin, angular, 5 m, shielded
ESW 31AH1000G	Connector M8, 4 pin, angular, 10 m, shielded
ESW 31SH0200G	Connector M8, 3 pin, angular, 2 m, shielded
ESW 31SH0500G	Connector M8, 3 pin, angular, 5 m, shielded

- Connector shielded, screen connected with cap nut
- 3 and 4 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

# ESG 32 - Connector M8 straight



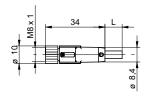


order reference	
ESG 32AH0200	Connector M8, 4 pin, straight, 2 m
ESG 32AH0500	Connector M8, 4 pin, straight, 5 m
ESG 32AH1000	Connector M8, 4 pin, straight, 10 m
ESG 32SH0200	Connector M8, 3 pin, straight, 2 m
ESG 32SH0500	Connector M8, 3 pin, straight, 5 m
ESG 32SH1000	Connector M8, 3 pin, straight, 10 m

- Connector unshielded
- 3 and 4 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836
- Meet EN 60079-25 requirements for intrinsically safe ATEX applications

# ESG 32G - Connector M8 straight, shielded



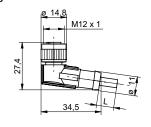


order reference	
ESG 32AH0200G	Connector M8, 4 pin, straight, 2 m, shielded
ESG 32AH0500G	Connector M8, 4 pin, straight, 5 m, shielded
ESG 32AH1000G	Connector M8, 4 pin, straight, 10 m, shielded
ESG 32SH0500G	Connector M8, 3 pin, straight, 5 m, shielded
ESG 32SH1000G/T	Connector M8, 3 pin, straight, 10 m, shielded

- Connector shielded, screen connected with cap nut
- 3 and 4 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

ESW 33 - Connector M12 angular	<b>ESW 33</b>	-	Connector M	12	angular
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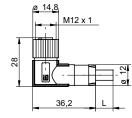


order reference	
ESW 33AH0200	Connector M12, 4 pin, angular, 2 m
ESW 33AH0500	Connector M12, 4 pin, angular, 5 m
ESW 33AH1000	Connector M12, 4 pin, angular, 10 m
ESW 33CH0200	Connector M12, 5 pin, angular, 2 m
ESW 33CH0500	Connector M12, 5 pin, angular, 5 m
ESW 33SH0200	Connector M12, 3 pin, angular, 2 m
ESW 33SH0500	Connector M12, 3 pin, angular, 5 m
ESW 33SH1000	Connector M12, 3 pin, angular, 10 m

- Connector unshielded
- 3, 4 and 5 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

# ESW 33G - Connector M12 angular, shielded



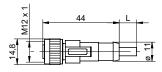


order reference	
ESW 33AH0200G	Connector M12, 4 pin, angular, 2 m, shielded
ESW 33AH0500G	Connector M12, 4 pin, angular, 5 m, shielded
ESW 33AH1000G	Connector M12, 4 pin, angular, 10 m, shielded
ESW 33CH0500G	Connector M12, 5 pin, angular, 5 m, shielded
ESW 33FH0200G	Connector M12, 8 pin, angular, 2 m, shielded
ESW 33FH0500G	Connector M12, 8 pin, angular, 5 m, shielded
ESW 33FH1000G	Connector M12, 8 pin, angular, 10 m, shielded

- Connector shielded, screen connected with cap nut
- 4, 5 and 8 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

# ESG 34 - Connector M12 straight



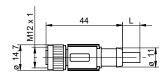


- Connector unshielded
- 3, 4 and 5 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

order reference	
ESG 34AH0200	Connector M12, 4 pin, straight, 2 m
ESG 34AH0500	Connector M12, 4 pin, straight, 5 m
ESG 34AH1000	Connector M12, 4 pin, straight, 10 m
ESG 34CH0200	Connector M12, 5 pin, straight, 2 m
ESG 34CH0500	Connector M12, 5 pin, straight, 5 m
ESG 34SH0200	Connector M12, 3 pin, straight, 2 m
ESG 34SH0500	Connector M12, 3 pin, straight, 5 m
ESG 34SH1000	Connector M12, 3 pin, straight, 10 m

# ESG 34G - Connector M12 straight, shielded





- Connector shielded, screen connected with cap nut
- 4, 5 and 8 pin versions
- Cable coating PUR
- Halogen-free
- Suitable for flexible cable carriers
- UL listed, number E315836

order reference	
ESG 34AH0200G	Connector M12, 4 pin, straight, 2 m, shielded
ESG 34AH0500G	Connector M12, 4 pin, straight, 5 m, shielded
ESG 34AH1000G	Connector M12, 4 pin, straight, 10 m, shielded
ESG 34CH0200G	Connector M12, 5 pin, straight, 2 m, shielded
ESG 34CH0500G	Connector M12, 5 pin, straight, 5 m, shielded
ESG 34CH1000G	Connector M12, 5 pin, straight, 10 m, shielded
ESG 34FH0200G	Connector M12, 8 pin, straight, 2 m, shielded
ESG 34FH0500G	Connector M12, 8 pin, straight, 5 m, shielded
ESG 34FH1000G	Connector M12, 8 pin, straight, 10 m, shielded

**ESG 32 ESG 32G ESW 31 ESW 31G** 

# M12 3 pin



**ESG 34S** 

**ESW 33S** 

# M12 4 pin

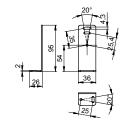


# M12 5 pin



# Mounting bracket for sensors O500/U500 (L design)





• Material: Steel

For use with O500

# order reference

11092246 Mounting bracket O500/U500 (L design)

# Mounting bracket for sensors O500/U500





• Material: Steel

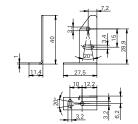
For use with U500

# order reference

11111164 Mounting bracket O500/U500 - Retrofit for sensors series

# Mounting bracket for sensors series 10





• Material: Steel

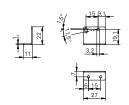
For use with UxDK 10, FxDK 10, OxDK 10

# order reference

10118798 Mounting bracket series 10

# Mounting bracket for sensors series 10 (L design)





• Material: Steel

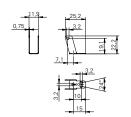
For use with UxDK 10, FxDK 10, OxDK 10

# order reference

10133792 Mounting bracket series 10 (L design)

# Mounting bracket for sensors series 10 (U design)





• Material: Steel

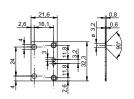
For use with UxDK 10, FxDK 10, OxDK 10 (only cabel versions)

# order reference

10114501 Mounting bracket series 10 (U design)

# Mounting panel for sensors series 10





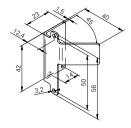
For use with UxDK 10, FxDK 10, OxDK 10

# order reference

10162083 Mounting panel for sensors series 10

# Sonic beam deflector for ultrasonic sensors U500





• Sonic beam deflector for ultrasonic sensors

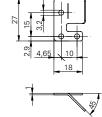
For ultrasonic sensors series 20

# order reference

11111163 Sonic beam deflector for sensors U500

# Sonic beam deflector for ultrasonic sensors series 10





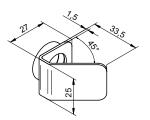
• Set of 2 included 1 x left, 1 x right

# order reference

10162376 Sonic beam deflector for ultrasonic sensors series 10

# Sonic beam deflector for ultrasonic sensors series 18 round





• Sonic beam deflector for ultrasonic sensors

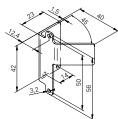
For ultrasonic sensors series 18

# order reference

10164264 Sonic beam deflector series 18 rectangular

# Sonic beam deflector for ultrasonic sensors series 20





• Sonic beam deflector for ultrasonic sensors

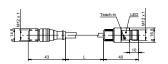
For ultrasonic sensors series 20

# order reference

10153290 Sonic beam deflector series 20

# Teach-in Adapter M12





# order reference

10141584 Teach-in Adapter M12

# Test unit for sensors analog & digital



- Output via display (V or mA) or LED (PNP/NPN)
- Teach-in of sensors with integrated Teach- button
- Connection for plug in power supply (available as accessory)

Test- and configuration device for analog and digital PNP/NPN sensors with 18 VDC supply voltage

# order reference

11084376 Test unit for sensors analog & digital

131

# Test unit for sensors digital



# • LED (red/green) for digital PNP/NPN signals

- Teach-in of sensors with integrated Teach- button
- Connection for plug in power supply (available as accessory)

Test- and configuration device for digital PNP/NPN sensors with 18 VDC supply voltage  $\,$ 

# order reference

11084377 Test unit for sensors digital

# Power supply for sensor test unit



# • Input 90-260 VAC

- Output 24 V/0,75 A
- Interchangeable plug-Type A, C, G and I

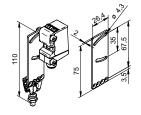
Protects the batteries of the sensor tester analog & digital for extended lifetime

# order reference

11087165 Test unit for sensors

# Sensofix-Mounting kit for sensors O500/U500





- Clamps made of stainless steel
- Ball pivots made of galvanized steel
- Mounting panel made of stainless steel

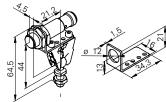
For use with photoelectric sensors O500

# order reference

11099942 Sensofix O500/U500

# Sensofix-Mounting kit for sensors series 12 round





- Clamps made of stainless steel
- Ball pivots made of galvanized steel
- Mounting panel made of stainless steel

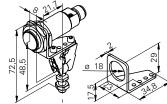
For use with all sensors in M12 housing

# order reference

10151720 Sensofix series 12 round

# Sensofix-Mounting kit for sensors series 18 round





- Clamps made of stainless steel
- Ball pivots made of galvanized steel
- Mounting panel made of stainless steel

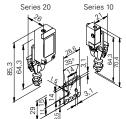
For use with all sensors in M18 housing

# order reference

10151658 Sensofix series 18

# Sensofix-Mounting kit for sensors series 10/20





- Clamps made of stainless steel
- Ball pivots made of galvanized steel
- Mounting panel made of stainless steel

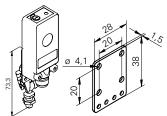
For use with photoelectric and ultrasonic sensors series 10, series 20

# order reference

10150326 Sensofix series 10 / series 20

# Sensofix-Mounting kit for sensors series 30





- Clamps made of stainless steel
- Ball pivots made of galvanized steel
- Mounting panel made of stainless steel

For use with inductive and ultrasonic sensors series 30

# order reference

10152386 Sensofix series 30

order reference	page	order reference	page	order reference	page
		ESW 33CH0500	137	UNAM 50I6121/S14	131
1		ESW 33CH0500G	137	UNAM 50N1721	43
10114501	140	ESW 33FH0200G	137	UNAM 50N1721/S14	43
10118798	140	ESW 33FH0500G	137	UNAM 50N3721	43
10133792	140	ESW 33FH1000G	137	UNAM 50N3721/S14	43
10141584	141	ESW 33SH0200	137	UNAM 50P1721	43
10150326	143	ESW 33SH0500	137	UNAM 50P1721/S14	43
10151658	143	ESW 33SH1000	137	UNAM 50P3721	43 43
10151720	143	U		UNAM 50P3721/S14 UNAM 50U6121	43 131
10152386	143			UNAM 5006121 UNAM 50U6121/S14	131
10153290	141	U500.DA0-11110575	121	UNAM 70I6131/S14	132
10162083	140 141	U500.DA0-11126857	121 121	UNAM 70U6131/S14	132
10162376 10164264	141	U500.DA0-11127346 U500.DA0-11135756	121	UNAR 18I6903/S14G	129
11084376	141	U500.DA0-11135757	121	UNAR 18I6912/S14G	128
11084377	142	U500.DA011135777	121	UNAR 18N6903/S14G	41
11087165	142	U500.PA0-11110577	31	UNAR 18N6912/S14G	40
11092246	140	U500.PA0-11120936	31	UNAR 18N7903/S14G	41
11099942	143	U500.RA0-11110579	71	UNAR 18N7912/S14G	40
11111163	141	U500.RA0-11127347	71	UNAR 18P6903/S14G	41
11111164	140	UEDK 20P6103/S35A	85	UNAR 18P6912/S14G	40
_		UEDK 30N5103	87	UNAR 18P7903/S14G	41
E		UEDK 30N5103/S14	87	UNAR 18P7912/S14G	40 129
ESG 32AH0200	136, 139	UEDK 30P5103	87	UNAR 18U6903/S14G UNAR 18U6912/S14G	129
ESG 32AH0200G	137	UEDK 30P5103/S14	87	UNCK 09G8914	20
ESG 32AH0500	136, 139	UNAM 12I9912/S14	125	UNCK 09G8914/D1	21
ESG 32AH0500G	137	UNAM 12I9914/S14	124	UNCK 09G8914/IO	97
ESG 32AH1000	136, 139	UNAM 12N1912/S14	36	UNCK 09G8914/KS35A	20
ESG 32AH1000G	137	UNAM 12N1914/S14	35	UNCK 09G8914/KS35A/IO	97
ESG 32SH0200	136, 139	UNAM 12N1914/S14D	33 36	UNCK 09G8914/KS35AD1	21
ESG 32SH0500	136, 139	UNAM 12N3912/S14 UNAM 12N3914/S14	36 35	UNCK 09T9114	98
ESG 32SH0500G	137	UNAM 12N8910/S140	34	UNCK 09T9114/D1	102
ESG 32SH1000	136, 139	UNAM 12N8910/S14OD	32	UNCK 09T9114/KS35A	98
ESG 32SH1000G/T	137	UNAM 12P1912/S14	36	UNCK 09T9114/KS35AD1	102
ESG 34AH0200 ESG 34AH0200G	138	UNAM 12P1914/S14	35	UNCK 09U6914	96
ESG 34AH0200G ESG 34AH0500	138 138	UNAM 12P1914/S14D	33	UNCK 09U6914/D1	100
ESG 34AH0500G	138	UNAM 12P3912/S14	36	UNCK 09U6914/KS35A	96
ESG 34AH1000	138	UNAM 12P3914/S14	35	UNCK 09U6914/KS35AD1	100 22
ESG 34AH1000G	138	UNAM 12P8910/S14O	34	UNDK 09G8914 UNDK 09G8914/D1	22
ESG 34CH0200	138	UNAM 12P8910/S14OD	32	UNDK 09G8914/IO	105
ESG 34CH0200G	138	UNAM 12U9912/S14	125	UNDK 09G8914/KS35A	22
ESG 34CH0500	138	UNAM 12U9914/S14	124	UNDK 09G8914/KS35A/IO	105
ESG 34CH0500G	138	UNAM 12U9914/S14D	123	UNDK 09G8914/KS35AD1	23
ESG 34CH1000G	138	UNAM 1816903/S14 UNAM 18N1703	126 37	UNDK 09T9114	106
ESG 34FH0200G	138	UNAM 18N3703	37	UNDK 09T9114/D1	110
ESG 34FH0500G	138	UNAM 18N6903/S14	38	UNDK 09T9114/KS35A	106
ESG 34FH1000G	138	UNAM 18P1703	37	UNDK 09T9114/KS35AD1	110
ESG 34SH0200 ESG 34SH0500	138 138	UNAM 18P3703	37	UNDK 09U6914	104
ESG 34SH1000	138	UNAM 18P6903/S14	38	UNDK 09U6914/D1	108
ESW 31AH0200	136	UNAM 18P7903/S14	38	UNDK 09U6914/KS35A	104
ESW 31AH0200G	136	UNAM 18U6903/S14	126	UNDK 09U6914/KS35AD1	108 24
ESW 31AH0500	136	UNAM 30I6103	130	UNDK 10N8914 UNDK 10N8914/KS35A	24 24
ESW 31AH0500G	136	UNAM 30I6103/S14	130	UNDK 10N8914/K335A	24
ESW 31AH1000	136	UNAM 30I6803/S14	130	UNDK 10N8514/355A	24
ESW 31AH1000G	136	UNAM 30N1104	42	UNDK 10P8914/KS35A	24
ESW 31SH0200	136	UNAM 30N1104/S14	42	UNDK 10P8914/S35A	24
ESW 31SH0200G	136	UNAM 30N3104 UNAM 30N3104/S14	42 42	UNDK 10U6914	112
ESW 31SH0500	136	UNAM 30N3104/514	42 42	UNDK 10U6914/KS35A	112
ESW 31SH0500G	136	UNAM 30P1104/S14	42	UNDK 10U6914/S35A	112
ESW 31SH1000	136	UNAM 30P3104	42	UNDK 2016903/S35A	116
ESW 33AH0200	137	UNAM 30P3104/S14	42	UNDK 20l6912/S35A	115
ESW 33AH0200G	137	UNAM 30U6103	130	UNDK 20I6914/S35A	114
ESW 33AH0500	137	UNAM 30U6103/S14	130	UNDK 20N6903/S35A	27
ESW 33AH0500G ESW 33AH1000	137 137	UNAM 30U9103	130	UNDK 20N6912/S35A	26
ESW 33AH1000G	137	UNAM 30U9103/S14	130	UNDK 20N6914/S35A	25
ESW 33CH0200	137	UNAM 50I6121	131	UNDK 20N7903/S35A	27
2.1. 22 31.10200				1	

134 www.baumer.com

page

order reference page	order reference
	order reference
UNDK 20N7912/S35A 26	UNDK 30P3713/S14
UNDK 20N7914/S35A 25	UNDK 30U6103
UNDK 20P6903/S35A 27	UNDK 30U6103/S14
UNDK 20P6912/S35A 26	UNDK 30U6104
UNDK 20P6914/S35A 25	UNDK 30U6104/S14
UNDK 20P7803/S35A 27	UNDK 30U6112
UNDK 20P7912/S35A 26	UNDK 30U6112/S14
UNDK 20P7914/S35A 25	UNDK 30U6113
UNDK 20U6903/S35A 116	UNDK 30U6113/S14
UNDK 20U6912/S35A 115	UNDK 30U9103
UNDK 20U6914/S35A 114	UNDK 30U9103/S14
UNDK 30I6103 119	UNDK 30U9112
UNDK 30I6103/S14 119	UNDK 30U9112/S14
UNDK 30I6104/S14 122	UNDK 30U9113
UNDK 30l6112 118	UNDK 30U9113/S14
UNDK 30I6112/S14 118	UR18.DA0-11119994
UNDK 30I6113 117	UR18.DA0-11135775
UNDK 30I6113/S14 117	UR18.PA0-11120038
UNDK 30N1703 30	UR18.RA0-11120042
UNDK 30N1703/S14 30	URAM 12N8910/S140
UNDK 30N1712 29	URAM 12N8910/S140
UNDK 30N1712/S14 29	URAM 12P8910/S140
UNDK 30N1713 28	URAM 12P8910/S140
UNDK 30N1713/S14 28	URAM 50N1721
UNDK 30N3703 30	URAM 50N1721/S14
UNDK 30N3703/S14 30	URAM 50P6121
UNDK 30N3712 29	URAM 50P6121/S14
UNDK 30N3712/S14 29	URAM 50P7121
UNDK 30N3713 28	URAM 50P7121/S14
UNDK 30N3713/S14 28	URAR 18N6912/S14G
UNDK 30P1703 30	URAR 18N7912/S14G
UNDK 30P1703/S14 30	URAR 18P6912/S14G
UNDK 30P1712 29	URAR 18P7912/S14G
UNDK 30P1712/S14 29	URCK 09G8914
UNDK 30P1713 28	URCK 09G8914/KS35A
UNDK 30P1713/S14 28	URDK 09G8914
UNDK 30P3703 30	URDK 09G8914/KS35/
UNDK 30P3703/S14 30	URDK 10N8914
UNDK 30P3712 29	URDK 10N8914/KS35/
UNDK 30P3712/S14 29	URDK 10N8914/S35A
UNDK 30P3713 28	URDK 10P8914

order reference	page
URDK 10P8914/KS35A	65
URDK 10P8914/S35A	65
URDK 20N6903/S35A	68
URDK 20N6912/S35A	67
URDK 20N6914/S35A	66
URDK 20N7903/S35A	68
URDK 20N7912/S35A	67
URDK 20N7914/S35A	66
URDK 20P6903/S35A	68
URDK 20P6912/S35A	67
URDK 20P6914/S35A	66
URDK 20P7903/S35A	68
URDK 20P7912/S35A	67
URDK 20P7914/S35A	66
URDK 30N1703/S14	69
URDK 30N3703/S14	69
URDK 30P1703/S14	69
URDK 30P3703/S14	69
URDK 30P6104/S14	72
URDK 30P7104/S14	72
USDK 20D9003/S35A	85
USDK 30D9003	87
USDK 30D9003/S14	87
UZAM 30N6103/S14	52
UZAM 30P6103	52
UZAM 30P6103/S14	52
UZAM 30P6803/S14C	52
UZAM 50N6121	53
UZAM 50N6121/S14	53
UZAM 50P6121	53
UZAM 50P6121/S14	53
UZAM 70N8131/S14C	54
UZAM 70P8131/S14C	54
UZDK 30N6112/S14	49
UZDK 30P6103	50
UZDK 30P6103/S14	50
UZDK 30P6104	51
UZDK 30P6104/S14	51
UZDK 30P6112/S14	49
UZDK 30P6113	48
UZDK 30P6113/S14	48

# Baumer — the strong partner.

We at Baumer are close to our customers, understand their needs and provide the best solution. Worldwide customer service for Baumer starts with on-the-spot personal discussions and qualified consultation. Our application engineers speak your language and strive from the start, through an interactive problem analysis, to offer comprehensive and user-compatible solutions.

# We are close to you across the globe.

The worldwide Baumer sales organizations guarantee short delivery times and readiness to supply. Many of our customers are directly linked via our electronic order system with the JIT logistics process.

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Closeness to the customer for Baumer means being available for your needs anywhere and at any time.



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We strive to be close to our customers all around the world. We listen to them, and then after understanding their needs, we provide the best solution. Worldwide customer service for us starts with on-the-spot personal discussions and qualified consultation. Our application engineers speak your language and strive from the start, through an interactive problem analysis, to offer comprehensive and user-compatible solutions. The worldwide Baumer sales organizations guarantee a high level of readiness to deliver.

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Baumer provides for every application the perfect solution.

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- Photoelectric sensors
- Ultrasonic sensors
- Capacitive sensors
- Magnetic sensors
- Mechanical precision switches

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- Inductive sensors
- Photoelectric sensors
- Ultrasonic sensors
- Bearingless linear encoders
- Cable-pull encoders

# Rotary encoders / Angle measurement

- Absolute encoders
- Incremental encoders
- HeavyDuty encoders
- Bearingless encoders
- Format alignment
- Inclination sensors

# Identification / Image processing

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- Vision Sensors

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- Temperature measurement
- Pressure measurement
- Conductivity measurement
- Force/strain sensors
- Counters
- Process displays



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