



Baumer

Passion for Sensors

# Efficient flow measurement

Electromagnetic flow meters

*CombiFlow*<sup>®</sup> and flow sensors *FlexFlow*<sup>®</sup>.



# Efficient flow measurement

Electromagnetic flow meters  
and flow sensors



The precise recording of volume and mass flows are the basis for efficient process control. A high signal quality ensures that the process can be operated at the highest reliability, minimal use of resources, and the lowest possible energy consumption. Volumetric and calorimetric sensors are used in all liquid media.

## Electromagnetic flow meters for measuring the volumetric flow



- Hygienic, industrial, and compact version, optionally with or without display
- For use in media with a conductivity of  $> 5 \mu\text{S}$
- Customized linings for media such as water, foods, chemicals, and solid-bearing liquids
- Diameters from DN 3 to DN 250
- Output of flow velocity and temperature

## Calorimetric flow sensors for measuring the flow velocity



- Reliably measures in aqueous media independent of the conductivity (also  $< 5 \mu\text{S}$ ) at temperatures up to  $150^\circ\text{C}$
- Reliably records the flow from 0.01 to 4 m/s
- Temperature can be read out directly as a separate measured variable
- Compact transmitter with M12 plug that supports both 2 analog outputs as well as the IO-Link interface
- Very limited process intervention due to the small fitting dimensions

For more information about the respective advantages of the different flow sensors see

[www.baumer.com/flow-measurement](http://www.baumer.com/flow-measurement)

# Everything in flow – efficient monitoring of the flow velocity and medium temperature.

## *FlexFlow*<sup>®</sup> PF20H/S flow sensors

The *FlexFlow*<sup>®</sup> flow sensor is the calorimetric solution for measuring the flow velocity in all aqueous media. Based on its calorimetric measuring process, it offers not only the flow velocity in the measuring tube but also the temperature of the medium as a measured value. With this compact sensor, flow velocities from 0.01 to 4 m/S can be detected with minimum process interference. According to the respective requirements, the flow sensor is available for hygienic or industrial applications.

### What makes *FlexFlow*<sup>®</sup> flow sensors so special?

#### Easy installation and commissioning

Thanks to the rotationally symmetrical design, the sensor can be reliably installed and quickly commissioned independent of the installation direction. The possibility of generating two signals with a single sensor lowers the efforts for cabling and control integration.

#### Digital integration via IO-Link

In addition to commissioning, digital integration also supports the operational processes. It supports simple parameterization and the use of the two main signals as well as additional sensor information that can be evaluated for preventive maintenance purposes.

#### Less process interference

The compact sensor causes barely any loss in pressure even in small tube diameters (e.g. in cooling circuits). As the temperature of the medium is measured in addition to the flow velocity, there is no need for an additional temperature measuring point.

#### Hygienic design

The sensor can be hygienically optimally integrated into the process via the BHC (Baumer Hygienic Connection) as well as other standard process connections. The compact transmitter with the stainless steel housing complies with the highest cleaning requirements.



# FlexFlow<sup>®</sup> flow sensors in operation.

Creating process transparency, lowering energy consumption



## Monitoring the energy consumption of process systems

The FlexFlow<sup>®</sup> flow sensors installed at relevant points of the heat exchanger system determine the current flow and consumption of energy based on the measured flow velocity and the temperature of the medium. This data can be used to not only optimize and monitor the heat exchange but also CIP and SIP processes.



## Monitoring of heating and cooling circuits

In addition to the product side of a heat exchanger, the FlexFlow<sup>®</sup> flow sensors can also be used to monitor the media side. The combined measurement of temperature and flow velocity allows deductions of the state of the heat exchanger, which ensures efficient operation and cleaning.



## Optimization of the filter process

The uniform infeed of the medium is an important prerequisite to prevent the premature moving of the filtration surface and securing sustained operations. The FlexFlow<sup>®</sup> flow sensor ensures that the flow velocity is always in the optimal range, thus decreasing the danger of unplanned cleaning or maintenance cycles.



## CIP supply and return lines

In CIP systems the FlexFlow<sup>®</sup> flow sensor is used to measure 2 out of 4 decisive cleaning parameters, i.e. the temperature and flow velocity with a single very compact sensor. Comparison of input and output parameters thus provides optimal cleaning results and maximum food safety in the shortest possible time.

# Hygienic design for the optimal support of CIP and SIP

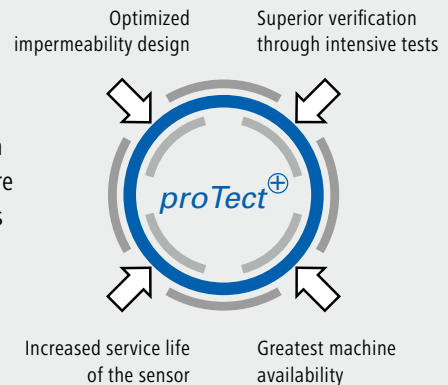
The *FlexFlow*<sup>®</sup> was developed to handle the challenges of hygienic and industrial processes with distinction. The design is EHEDG-certified. The selected materials comply with the requirements of FDA, EU 1935/2004, 10/2011 and 2023/2006. The housing complies with the same stringent requirements and also fulfills IP 69, the highest industry requirements. In addition, the Baumer *proTect+* impermeability concept guarantees the impermeability and reliability of the sensors across their entire life cycle. With a temperature range from –25 to 150 °C, the flow sensor is especially suited for Cleaning-in-Place (CIP) and Sterilization-In-Process (SIP) tasks.

## *proTect+* impermeability concept – reliable, sealed sensors across the entire life cycle

*proTect+* is an impermeability concept developed by Baumer that ensures the long-term function of the sensor even under the most demanding circumstances. In other impermeability tests, sensors are only tested for water tightness when they are new, but the *proTect+* test series initially simulate the ageing effects of the sensors before the sensors are subjected to impermeability tests in line with the IP protection class directives.

Additional information about *proTect+*

[www.baumer.com/protect-plus](http://www.baumer.com/protect-plus)

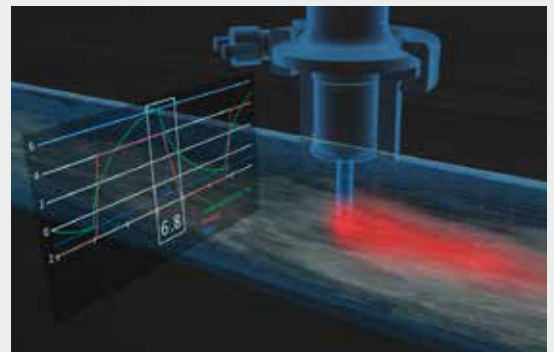


## Flow measurement based on the calorimetric measurement principle

The calorimetric flow sensor differentiates between no flow and flow by detecting whether heat is dissipated by the medium or not. The use of a symmetrically arranged sensor element makes the sensor independent of the installation position.

More information about the function principle

[www.baumer.com/function-flex-flow](http://www.baumer.com/function-flex-flow)

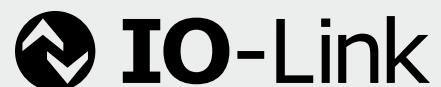


## Added value through digital sensor data

The IO-Link interface allows several sensors to be parameterized at the same time. This simplifies the switching point adaptation for various process steps and saves time. Beyond the basic function of velocity measurement, IO-Link allows the *FlexFlow*<sup>®</sup> sensors to communicate additional secondary information such as process or diagnostic data to the controller or even store the data itself for later retrieval if needed.

More information about IO-Link in process automation

[www.baumer.com/io-link-process-sensors](http://www.baumer.com/io-link-process-sensors)



# Save resources – from optimal pump performance up to precise media dosage.

## Volumetric flow measurement with electromagnetic flow meters PF55S and *CombiFlow*® PF75H/S

The electromagnetic flow meters from Baumer measure the volume up to 1770 m<sup>3</sup>/h, the flow velocity, and the temperature of media with a conductivity of > 5 µS/cm in closed pipes. The sensors are based on the induction principle. Customized air-core coils for every pipe diameter from DN3 to DN250 ensure a continuous magnetic field and thus precise and stable measurement results with an accuracy of up to 0.2%. Depending on the application, the sensors are available in a hygienic or industrial design.

Why should you choose volumetric measurement with Baumer? Save costs!

Save resources thanks to precise measurement with maximum long-term stability

1

Resources are saved in stock, mixing and dosage processes as they can be highly precisely optimized and controlled to reduce waste to a minimum. Customized coreless air-core coils that cover the entire length of the measuring pipe, achieve particularly precise, stable, and reliable measurement results with an accuracy of up to 0.2%.



No energy loss thanks to a continuous measuring tube

2

The electromagnetic flow meters PF75 are equipped with a continuous measuring tube without constriction or fittings, which prevents pressure loss in the system. This allows optimal pump performance without energy loss in the system. The magnetic coil design results in high precision without having to reduce the measuring tube diameter.



All information at a glance with the *CombiView* display

3

The display of the *CombiSeries* allows uniform operation and process monitoring across the entire *CombiSeries* product range, including temperature, pressure, conductivity, and flow measurement. All required information is detected and displayed in such a way that it can be seen at a single glance, even from a large distance. The display allows intuitive operation with a touch screen and two relay outputs for direct process control.



# Our flow meters. Your advantages during processing.

Optimal resource deployment based on a stable performance up to 0.2% precision

- The magnetic field is optimized for each measuring pipe diameter via especially conceived coreless air-core coils.
- Quick and sensitive response times.
- Stable performance across the entire measurement range, independent of the temperature.

No energy loss

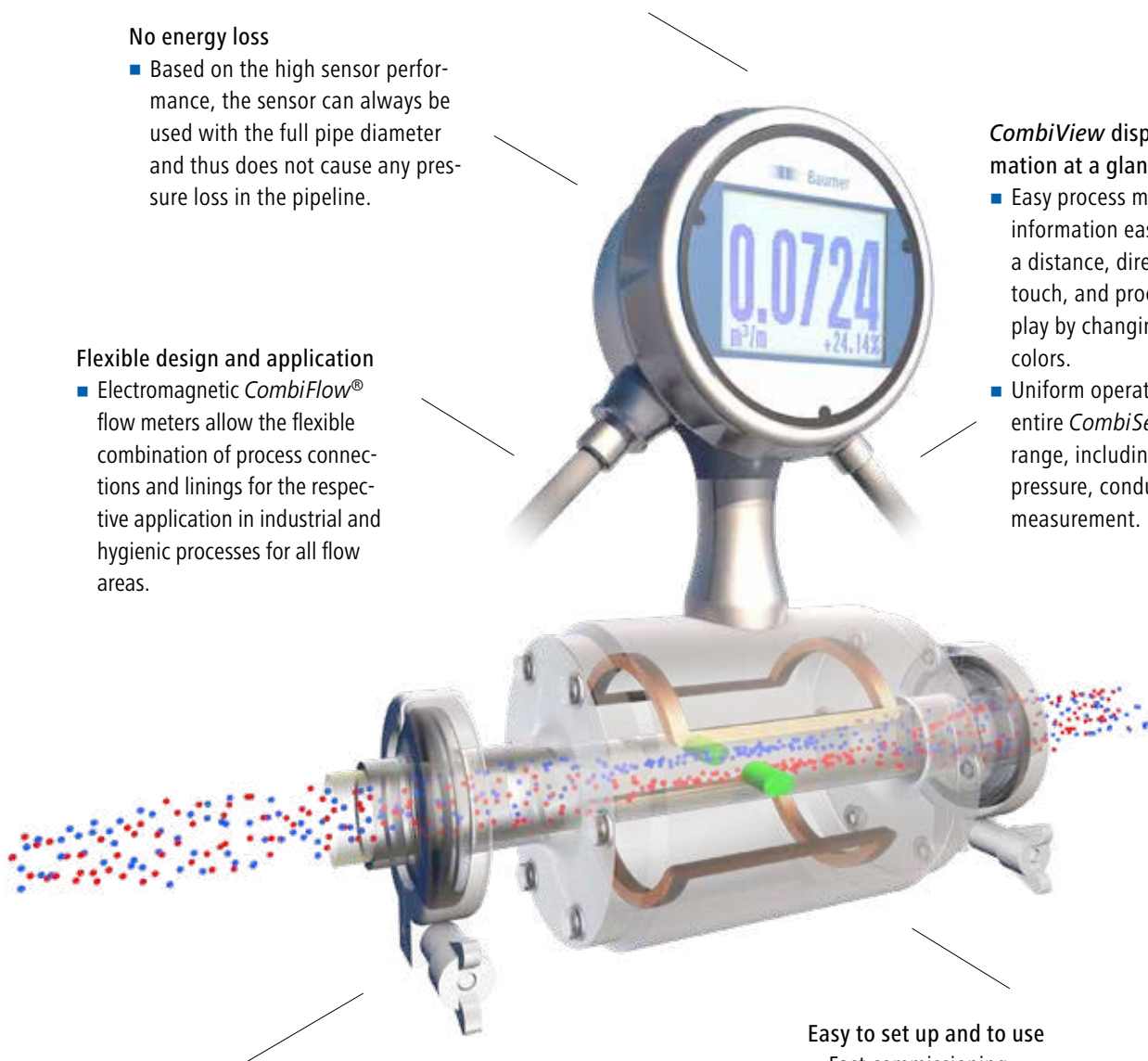
- Based on the high sensor performance, the sensor can always be used with the full pipe diameter and thus does not cause any pressure loss in the pipeline.

Flexible design and application

- Electromagnetic *CombiFlow*<sup>®</sup> flow meters allow the flexible combination of process connections and linings for the respective application in industrial and hygienic processes for all flow areas.

*CombiView* display – all information at a glance

- Easy process monitoring – information easy to read from a distance, direct operation via touch, and process status display by changing background colors.
- Uniform operation across the entire *CombiSeries* product range, including temperature, pressure, conductivity, and flow measurement.



Highest long-term process stability

- No movable parts and thus reduced maintenance effort.
- Non-solenoid core air-core coil creates a lasting magnetic field that is not affected by temperature changes or external influences.
- Specially adjusted linings are available for each process.
- Temperature and vacuum-resistant linings.

Easy to set up and to use

- Fast commissioning.
- Parameterization via USB.
- BCP software available for download free of charge.
- Several measurement variables collected by a single sensor

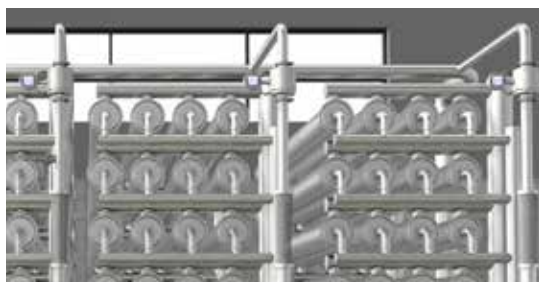
# Electromagnetic flow meters during processing.

Highly precise reporting. No pressure loss. Exact dosages.



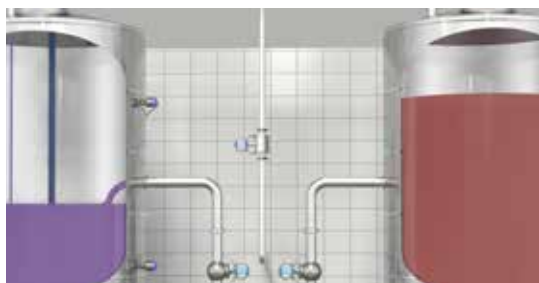
## Content measurement inside tanks

Electromagnetic flow meters in the tank inlet and outlet for a redundant detection of the medium volume with a hydrostatic pressure sensor.



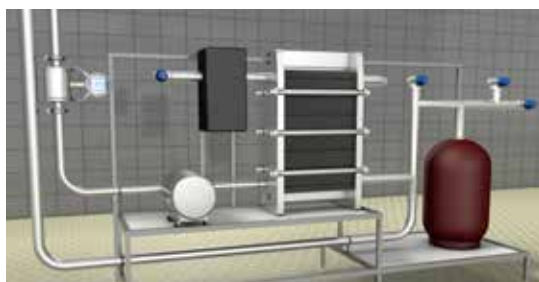
## Filter monitoring

Increased filter service life by uniform product infeed with continuous volumetric flow measurement as a complementary measurement to the pressure measurement.



## Dosage of cleaner concentrate solutions

Precise dosage, e.g., of cleaning agents in CIP applications. Careful and optimized handling of high-quality media and prevention of excess dosages or unnecessary disposal expenses.



## Monitoring of cooling circuits

Continuous, quick, and temperature-related monitoring of the coolant, e.g., during machining production processes such as drilling and turning, to protect the tool / processing center from thermal overstrain.

## Conformity and approvals

The electromagnetic flow meters from Baumer comply with the key standards and approvals of process measurement technology, thus guaranteeing the highest reliability in such settings.



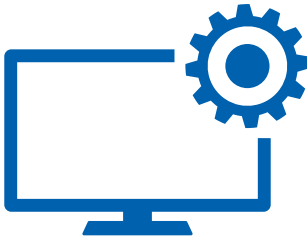
# The flow meter for every process.

## Always the correct choice. Easily parameterized.



### Calibration at the factory – no subsequent calibration required

Prior to delivery, all electromagnetic flow meters are calibrated by an accredited calibration laboratory according to ISO 17036 (ACCREDIA certificate LAT237) and do not require calibration on location. You will receive the calibration certificate on paper and electronically upon delivery of the product.

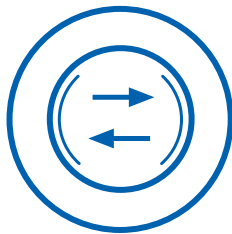


### BCP operating software

The flow sensor is configured via the Baumer Control Panel (BCP) operating software. The software allows user-friendly and easy access to all programmable functions of the flow meter. The quick start menu supports quick initial start up.

For more information see

[www.baumer.com/bcp-software](http://www.baumer.com/bcp-software)



### From drinking water to chemicals – the right choice of pipe lining and electrode material

The electromagnetic flow meters from Baumer offer a wide range of measurement pipe linings for every medium. The correct selection of the optimum material depends on the medium, proportion of solids in the medium, and the process temperature.

For more information see

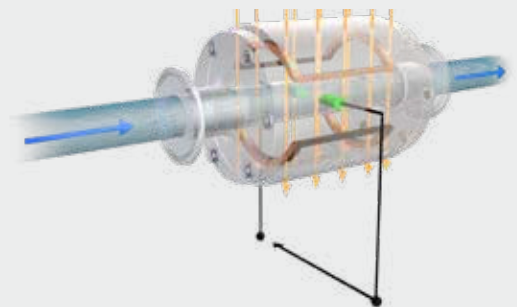
[www.baumer.com/Lining](http://www.baumer.com/Lining)

### Volumetric flow measurement based on the induction principle

The measurement principle of the electromagnetic flow meter is based on Faraday's law of electromagnetic induction. Electric current is generated via the magnetic field in the measurement pipe, which is then converted into the flow volume by the integrated electronics.

Additional information about the functionality

[www.baumer.com/function-magmeter](http://www.baumer.com/function-magmeter)



# Product overview

## Flow measurement



	<i>FlexFlow</i> ® PF20H	<i>FlexFlow</i> ® PF20S
Product highlights	<ul style="list-style-type: none"> <li>■ Hygienic design</li> <li>■ SIP/CIP capacity</li> <li>■ Flow and temperature measurement in a single sensor</li> <li>■ Compact and robust</li> <li>■ Two analog outputs or IO-Link plus programmable output</li> <li>■ No movable parts</li> </ul>	<ul style="list-style-type: none"> <li>■ Industrial process connections</li> <li>■ Flow and temperature measurement in a single sensor</li> <li>■ Compact and robust</li> <li>■ Two analog outputs or IO-Link plus programmable output</li> <li>■ No movable parts</li> </ul>
Application examples	Flow control, control of CIP processes	Flow control
Media	Water Beverages Cleaning agents	Water Water-glycol mix (max. 30 % glycol)
Temperature of the medium	-25 ... +150 °C 40 bar max.	-25 ... +150 °C 100 bar max.
Measuring ranges	0.01 ... 4 m/s -25 ... +125 °C	0.01 ... 4 m/s -25 ... +125 °C
Material of the parts in contact with the media	AISI 316L (1.4404)	AISI 316L (1.4404)
Output signal	Programmable switching output IO-Link 1.1 4 ... 20 mA 0 ... 10 V	Programmable switching output IO-Link 1.1 4 ... 20 mA 0 ... 10 V
Accuracy	≤ 2% (FS)	≤ 2% (FS)
Degree of protection	IP 67, IP 68, IP 69K	IP 67, IP 68, IP 69K
Conformity and approvals	cULus FDA	cULus
Process connections	For various process connection options, see the enclosed selection guide	

Online configuration – find the right sensor quickly and easily. Configure the right sensor for your application.

[www.baumer.com/flexflow](http://www.baumer.com/flexflow)

# Volumetric flow measurement



	PF55S	CombiFlow® PF75S	CombiFlow® PF75H
Product highlights	<ul style="list-style-type: none"> <li>■ Volumetric flow, flow velocity, and temperature measurement in a single sensor</li> <li>■ Accuracy up to 0.5%</li> <li>■ Compact, robust, and resistant to temperature leaps</li> <li>■ No movable parts</li> </ul>	<ul style="list-style-type: none"> <li>■ Volumetric flow and flow velocity measurement in a single sensor</li> <li>■ Accuracy up to 0.5%</li> <li>■ Robust and resistant to temperature jumps</li> <li>■ No pressure loss due to restrictions or fittings</li> <li>■ No movable parts</li> </ul>	<ul style="list-style-type: none"> <li>■ Volumetric flow and flow velocity measurement in a single sensor</li> <li>■ Accuracy up to 0.2%</li> <li>■ Hygienic design for SIP/ CIP applications</li> <li>■ No pressure loss due to restrictions or fittings</li> <li>■ No movable parts</li> </ul>
Application examples	<ul style="list-style-type: none"> <li>■ Detection and monitoring of constant flows</li> <li>■ Monitoring of cooling circuits</li> </ul>	<ul style="list-style-type: none"> <li>■ Detection and monitoring of constant flows</li> <li>■ Reporting/content measurement inside tanks</li> <li>■ Highly precise dosage of fluids</li> </ul>	<ul style="list-style-type: none"> <li>■ Detection and monitoring of constant flows</li> <li>■ Reporting/content measurement inside tanks</li> <li>■ Highly precise dosage of fluids</li> </ul>
Media	Conductive media with a conductivity of > 50 µS/cm	Conductive media with a conductivity of > 5 µS/cm	Conductive media with a conductivity of > 5 µS/cm
Temperature of the medium	-10 ... +100 °C	-20 ... +100 °C	-20 ... +100 °C -20 ... +130 °C (max. 30 min)
Measuring ranges	0 ... 72 m³/h 0 ... 72 000 l/h 0.4 ... 10 m/s -10 ... +100 °C	0 ... 1770 m³/h 0 ... 1 770 000 l/h 0.4 ... 10 m/s	0 ... 280 m³/h 0 ... 280 000 l/h 0.4 ... 10 m/s
Pipe diameter	DN10 ... DN50	DN25 ... DN250	DN3 ... DN100
Material of the parts in contact with the media	PTFE/FPM, AISI 316, FPM, AISI 304	PTFE, rilsan, ebonite, PP, FKM	PTFE, FKM, AISI 316L
Output signal	1× 4 ... 20 mA 2× pulse and frequency outputs Digital input	1× 4 ... 20 mA 2× pulse and frequency outputs Digital input	1× 4 ... 20 mA 2× pulse and frequency outputs Digital input
Accuracy (max. measurement error)	± 1% (opt. 0.5%) ± 2 °C	± 0.8% (opt. 0.5%)	± 0.5% (opt. 0.2%)
Degree of protection	IP 67	IP 65, IP 67	IP 65, IP 67
Conformity and approvals	CE DGRL PED	CE DGRL PED WRAS	CE DGRL PED 3A FDA 1935/2004

Online configuration – find the right sensor quickly and easily. Configure the right sensor for your application.

[www.baumer.com/magmeter](http://www.baumer.com/magmeter)

# Worldwide presence.



## Africa

Algeria  
Cameroon  
Côte d'Ivoire  
Egypt  
Morocco  
Reunion  
South Africa

## America

Brazil  
Canada  
Colombia  
Mexico  
United States  
Venezuela

## Asia

Bahrain  
China  
India  
Indonesia  
Israel  
Japan  
Kuwait  
Malaysia  
Oman  
Philippines  
Qatar  
Saudi Arabia  
Singapore  
South Korea  
Taiwan  
Thailand  
UAE

## Europe

Austria  
Belgium  
Bulgaria  
Croatia  
Czech Republic  
Denmark  
Finland  
France  
Germany  
Greece  
Hungary  
Italy  
Malta  
Martinique  
Netherlands  
Norway  
Poland  
Portugal  
Romania  
Russia  
Serbia  
Slovakia  
Slovenia  
Spain  
Sweden  
Switzerland  
Turkey  
United Kingdom

## Oceania

Australia  
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