Efficient flow measurement
Electromagnetic flow meters
*CombiFlow*® and flow sensors *FlexFlow*®.
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

- CombiFlow® PF75H
- CombiFlow® PF75S

- Hygienic, industrial, and compact version, optionally with or without display
- For use in media with a conductivity of > 5 µS
- 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

- FlexFlow® PF20S
- FlexFlow® PF20H

- Reliably measures in aqueous media independent of the conductivity (also < 5 µS) at temperatures up to 150 °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
Everything in flow – efficient monitoring of the flow velocity and medium temperature.

*FlexFlow®* PF20H/S flow sensors

The *FlexFlow®* 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®* 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® flow sensors in operation.**
Creating process transparency, lowering energy consumption

**Monitoring the energy consumption of process systems**
The FlexFlow® 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® 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® 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® 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® 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.


**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® 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.

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$^3$/h, the flow velocity, and the temperature of media with a conductivity of $> 5 \mu$S/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!

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

   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%.

2. **No energy loss thanks to a continuous measuring tube**

   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.

3. **All information at a glance with the CombiView display**

   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® flow meters allow the flexible combination of process connections and linings for the respective application in industrial and hygienic processes for all flow areas.

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.

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.

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.

CE PED FDA 1935/2004
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

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<td>–25 … +150 °C</td>
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<td>0.01 … 4 m/s</td>
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<td>–25 … +125 °C</td>
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<td>AISI 316L (1.4404)</td>
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Online configuration – find the right sensor quickly and easily. Configure the right sensor for your application.

www.baumer.com/flexflow
## Volumetric flow measurement

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<th>PF55S</th>
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</table>
| **Product highlights** | - Volumetric flow, flow velocity, and temperature measurement in a single sensor  
- Accuracy up to 0.5%  
- Compact, robust, and resistant to temperature leaps  
- No movable parts  | - Volumetric flow and flow velocity measurement in a single sensor  
- Accuracy up to 0.5%  
- Robust and resistant to temperature jumps  
- No pressure loss due to restrictions or fittings  
- No movable parts  | - Volumetric flow and flow velocity measurement in a single sensor  
- Accuracy up to 0.2%  
- Hygienic design for SIP/CIP applications  
- No pressure loss due to restrictions or fittings  
- No movable parts  |
| **Application examples** | - Detection and monitoring of constant flows  
- Monitoring of cooling circuits  | - Detection and monitoring of constant flows  
- Reporting/content measurement inside tanks  
- Highly precise dosage of fluids  | - Detection and monitoring of constant flows  
- Reporting/content measurement inside tanks  
- Highly precise dosage of fluids  |
| **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
- New Zealand

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