

# Mass Flow Measurement

The specialists for direct mass measurement of fluids and gases



- Measurement independent of density, temperature, viscosity, pressure and conductivity
- High precision calibration
- Versatile EX design
- Comprehensive approvals
- Wide range of communications offerings

ABB Instrumentation



# The first choice for any medium

## Reliable mass measurement

Collecting reliable flowrate information is a standard activity in a variety of industries. To measure mass independent of density, temperature, viscosity, pressure and conductivity, direct measurement methods are being deployed increasingly. ABB offers the suitable device for virtually any measurement activity.



## Measuring fluids with CoriolisMaster

The Coriolis mass flowmeter is especially suited to measuring fluids. Its large spectrum of meter sizes allows measurement from drops to the contents of tankships. The Coriolis flowmeter provides more than pure flow measurement. By measuring the resonant frequency to a tenth of a Hertz, the density of the medium can also be determined.

The unique pipe geometry minimizes the effects of gas content, changing environmental factors or vibration, and the meter provides unparalleled accuracy and stability. Different accuracy classes in a single device with identical installation depth and common electronics for all sensor models further ensure that the CoriolisMaster series has maximum flexibility. Based on the highly accurate density measurement, parameters such as concentrations, net-oil content in water-oil mixtures or constant values (e.g., Brix or PLATO) can be calculated with the optional special software Densimass.

- Multivariability and precision
- Easy to install in all angles and positions
- No expendable parts – sturdy design
- Bursting pressure up to 1,200 bar
- Approvals: ATEX, FM, CSA, GOST, NEPSI, NACE, EHEDG, type-tested to meet NAMUR
- Communication: HART, PROFIBUS, FOUNDATION Fieldbus
- SIL assessed

## Measuring gases with Sensyflow flowmeters

For gaseous media, ABB offers its intelligent thermal gas-mass flowmeters in the Sensyflow series. Using a thermal measuring process (hot film anemometer), the mass flow of all technical gases such as nitrogen, oxygen, hydrogen, etc., and gas mixtures (natural gas, biogas, compressed air) can be measured directly. The thermal measuring principle works without additional pressure or temperature compensation.

The Sensyflow series features special units for process gas measurements, boiler control, biogas measurements, compressed air accounting as well as measurements in pharmaceuticals, pneumatics and the food and beverage industry. Test benches for combustion engines and vehicle components, in addition to paint robots, can be specially equipped with high-performance device designs.

- Extremely short response times
- Negligible pressure loss
- Sturdy design without movable parts
- High measuring accuracy and dynamics
- Additional measuring range
- Approvals: ATEX, CSA, DVGW, ASAM, FML Weihenstephan
- Communication: HART, PROFIBUS
- SIL assessed

## Precisely calibrated and certified

The high accuracy of the measuring systems is a result of the highest precision during calibration. Every transmitter is subjected to extensive tests, including aging and a careful calibration procedure. State-of-the-art testing facilities are available for these purposes.

The calibration facilities are associated with the German Calibration Service (DKD-K-05701) and accredited by the German national metrology institute (PTB). A flowrate calibration facility for process gases that is unique worldwide further expands the offering of calibration services. Under actual operating conditions, flowmeters can be calibrated precisely with a variety of gases and gas mixtures.



### Measuring saturated steam with FV4000 (vortex) and FS4000 (swirl) flowmeters

The vortex and swirl flowmeters present a convincing financial solution for measuring saturated steam in mass flow units, based on their integrated temperature measurement. These meters are used when a constant accuracy is required, for instance, when larger measuring spans with a more constant accuracy are required than with delta P and orifice.

- Highly accurate even for short inflow/outflow sections.
- No expendable parts, no maintenance – no movable parts
- Large measuring span
- Lowest installation costs as result of 2-conductor technology
- Variety of process connections
- Remote versions
- Approvals: ATEX, FM, CSA
- Communication: HART, PROFIBUS PA 3.0, FOUNDATION Fieldbus
- SIL assessed

### Measuring fluids, steam and gases with 2600T pressure transmitters

A conventional and proven method for determining flowrate of fluids, gases or steam is to measure differential pressure. The drop in pressure of a medium flowing at a cross-sectional narrowing is taken as a measurement value.

The mass flow is measured using a multivariable transmitter. It measures the pressure drop at a differential flow sensor as well as the static pressure and process temperature via directly connected temperature sensor (PT100). Based on these parameters, the unit calculates the mass flow for steam or the standard volume flow of gases, using the dynamic compensation function with continuous calculation of Reynolds number and flow coefficient. Transmitter and differential sensor, e.g., venturi tube, standard orifice or pitot tube, are calibrated precisely to the measuring task to ensure the best possible accuracy.

- Ideal for high static pressures (up to 400 bar)
- High media temperatures
- Approvals: ATEX, FM, CSA, SIL
- Communication: HART, PROFIBUS, FOUNDATION Fieldbus, Modbus
- SIL2 classified

ABB is a leader in power and automation technologies that enable utility and industry customers to improve performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries and employs about 108,000 people.

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