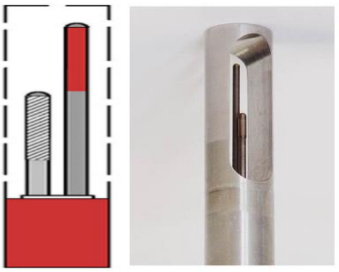
Monitoring the flow of gases, liquids, vapors and powders

The ECM Group, in cooperation with partner organizations, provides solutions, supplies, installation, service and consulting in the field of flow measurement of gases, liquids, vapors and solids. To ensure reliable solutions, our partners are the world's leading manufacturers of measuring technology. To cover the widest possible industrial area, our portfolio includes devices with different measuring principles. We offer non-invasive measurement of process media and in-situ measurements, according to the suitability for a specific application and customer needs.

In our portfolio we offer reliable instruments from our partners. Kurz for measuring flow of liquids and gases, Esters for measuring gases, Promecon for measuring flow of polluted hot gases. Dyna Instruments supplies state-of-the-art instruments for measuring bulk materials. We represent Sommer and Hydreka to monitor river flow and water flow in open systems.

Kurz Flowmeters

Thermal conductivity flowmeters are suitable solution for many applications. This type of device is offered by our partner Kurz. Kurz thermal conductivity flowmeters can be used to advantage for many applications where it is necessary to accurately measure the flow rate of gaseous media. The main advantages are direct mass flow measurement, high measurement sensitivity even at very low speeds, large dynamic range (up to 1000: 1), low pressure drop and pollution resistance. Conventional thermal conductivity flowmeters use the constant energy method and their use is limited in many applications by a significant dependence on the humidity of the monitored gas. Kurz flow meters work on the principle of constant temperature, when the sensor is kept at a temperature that significantly exceeds the temperature of the monitored gas. The flowing gas draws energy from the sensor surface, which the electronics then compensates for with increased heating input. This power input is directly proportional to the gas flow rate. The sensor response is very fast. As can be seen in the figure, the sensor consists of a probe for monitoring the process gas temperature and a heated probe which is maintained at the set temperature. The orientation of the pair of probes in the flow direction is not critical.



The advantages of the flow meter are: robust construction, almost linear characteristics, response within one second, vibration resistance, temperature range up to 600° C, self-cleaning, independence of moisture content and high resistance to abrasive influences. The manufacturer provides a standard 3-year warranty on the flowmeters.

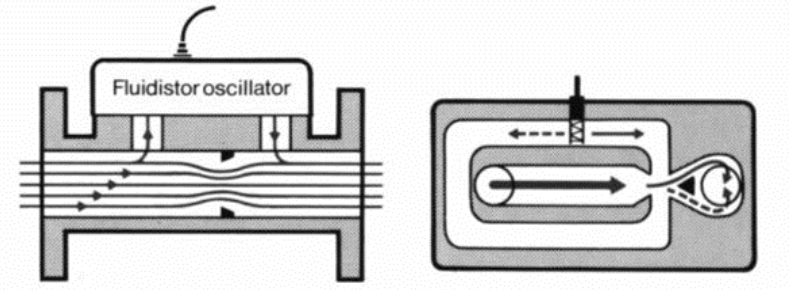
Flow meters are available in versions:

- Portable,
- In-line for small diameter,
- Pointed out,
- Multipoint, larger average, turbulent flow.

There is also a version for measuring explosive gases and in potentially explosive atmospheres.

Esters Flowmeters

Esters flowmeters are a suitable solution for monitoring the volume flow of slow-flowing wet gases as well as hydrogen. Esters volumetric flowmeters operate on the principle of a "fluidistor oscillator". It consists of two chambers and a connecting part in which metastable pressure conditions are created.



As a result, the flow direction changes. The alternation period is proportional to the gas flow rate and is sensed by a thermal conductivity sensor. For small diameters (DN15) the gas flows through the fluidistor directly, for larger diameters (up to DN600) the fluidistor is connected to the flow module of the required diameter. The flow meter is ideal for slow-flowing gases, which can be heavily polluted and with variable humidity up to saturation. Accuracy is 1.5% of the measured value from 0.25 m/s.

The dynamic range is 1: 100. The sensor responds very fast, T90 is below 50 ms. The medium pressure can be up to 40 bar, the maximum temperature is 120 ° C (for the ATEX version it is limited to 85 ° C). Repeatability is 0.1%, V4 steel construction guarantees corrosion resistance.

The flowmeter requires almost no maintenance. If, in extreme cases, the fluidist nevertheless becomes contaminated, it is sufficient to open it, clean e.g. steam and reseal. Calibration is not required, accuracy is guaranteed by the robust steel design. Particularly advantageous applications are biogas from anaerobic WWTP stages and various biofermeters, as well as waste gases from chemical, refinery and metallurgical production.

Contaminated hot gas flow meters McONAir

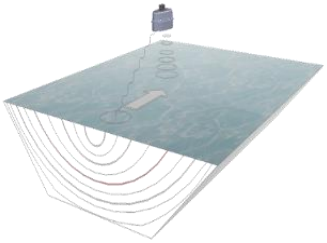
The McONAir device from Promecon is designed for monitoring the flow of gases that contain abrasive particles of carbon ash or zinc ash with a temperature of up to 1000°C. This is usually the combustion air supplied to the burners.

The principle of the measurement is that a pair of triboelectric sensors made of hardened material is placed in the pipe at a distance of 350 mm from each other. The impact of the particles in the flowing air generates an electrical signal, and the resulting flow is quantified based on the time it takes for the particles to fly this distance between the sensors. This phenomenon allows accurate measurement of the flow of such a "problematic medium".

Flow measurement in rivers and channels

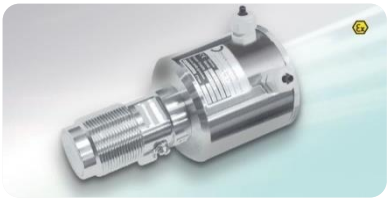
To measure the flow, it is possible to use a monitor located above the surface, which is equipped with a radar or ultrasonic level meter, or Doppler radar to determine the speed of water flow. It is possible to enter a channel profile or a riverbed into the monitor. The monitor then makes it possible to monitor the volume flow of water, taking into account the flow characteristics in the cross section of the profile.

The second option is to place the sensor on the bottom or on walls of the channel profile. Ultrasonic sensors use the Doppler effect to measure the speed of water flow. The level is measured either by a built-in pressure level or by an external sensor. After entering the profile, the device evaluates the flow of water.



Flow of bulk materials and granules

Electronic motion and mass flow sensors for bulk materials and granules can be elegantly determined with **Dyna Instruments** devices.
These are devices that work on the capacitive or microwave principle and monitor the speed of movement, density and mass flow of material in the pipeline.



For special applications, it is also possible to use sensors based on gamma radiation or mass discontinuity.
This technology replaces unreliable mechanical solutions and allows you to implement continuous unattended operation.

For detailed information on any solutions of your interest we are gladly available on our below contact:

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