Ultrasonic Flowmeters

Electromagnetic flowmeters
Variable area flowmeters
Vortex flowmeters
Flow controllers

Ultrasonic flowmeters
Mass flowmeters
Level measuring instruments
Pressure and temperature
Heat metering
Communications technology
Switches, counters, displays and recorders
Engineering systems & solutions
Ultrasonic Flowmeters

**ALTOSONIC flowmeters**

for custody transfer

With the introduction 10 years ago of the ALTOSONIC 5-beam flow meter for custody transfer of multiphase hydrocarbons, KROHNE introduced the technology that will replace mechanical meters such as turbines, PD's and venturis. In 2004 the American Petroleum Institute (API) finally endorsed ultrasonic inline flowmetering as a technology for the oil and gas industry. Calibrated and certified to OIML R-117 they offer:

- High-accuracy, long-term repeatability
- Negligible pressure loss
- No periodic recalibration
- No moving parts, no wear and tear
- Zero maintenance - no strainers needed
- Most economical cost of ownership

**ALTOSONIC V**

5-Beam multiproduct ultrasonic flowmeter for oil and oil products consisting of flowmeter body and comprehensive flow processor system with AltoSuite software

Superior performance

- Highest accuracy (0.15%) and repeatability (0.04%)
- Viscosity independent (Q/v = 1:1000)
- Negligible effect of distorted flow profiles and swirl
- High dynamic range
- Multiple parameter outputs
- Bi-directional flow measurement

Superior reliability

- Multiple beams ensure redundancy and validation of results
- Redundant electronics
- Internal diagnostics
- System includes meter body and flow processor

**ALTOSONIC III**

3-Beam ultrasonic flowmeter for light liquid hydrocarbons, the successor to the standard turbine for single products

- Non-intrusive
- No wear and tear
- No periodic maintenance
- Compensates for laminar and turbulent flow

**ALTOSONIC IV**

4-Beam ultrasonic flowmeter for gasses

- 3D overall length only
- Low power consumption < 1W, suitable for solar power
- All metal cast iron construction
- No pressure loss
- Complies with AGA-9 custody-transfer requirements
Process meters (non-custody transfer)

**UFM 3030 3-Beam Flowmeter for liquids**

The meter to replace turbines, pd’s, venturis and in some cases even Coriolis meters for the measurement of liquid hydrocarbons in the process industry.

- Metering of low-conductivity liquids, including solvents and raw materials
- Metering of cooling water
- Metering of demineralized water
- Inline flow measurement in pipelines for oil and gas products
- High dynamic range
- Multiple parameter outputs
- Bi-directional flow measurement

Advantages over mechanical meters:
- Long term stability and high reliability
- Lower operational and maintenance costs
- At an attractive price

**GFM 700 flowmeter for gas**

This gas meter is available in sizes suitable for the process industry with meter sizes starting at 2 inch (DN 50).

The meter offers all the cost, performance and handling features of its liquid counterparts.

**Why 3 beams are better than 1 or 2 beams for liquids**

With 1 beam (C) the flow near the center of the pipe is measured. The flow near the wall of the tube is not measured. Laminar flow is not considered.

With 2 beams (A + B) the flow nearer the outside is measured. Differences between A and B beams indicate sedimentation, but again laminar flow is not considered.

With 3 beams (A + B + C) the flow in the middle and near the walls is measured. Differences between C and B or C and A can be used to compensate for the flow profile between laminar and turbulent flow.

**Wide range of application**

The large range of products that can be measured accurately and easily make this a truly universal device. Just a few examples:

- Natural gas
- Air
- Methane
- Nitrogen
- Determination of the molecular weight of gases
- Measurement in hazardous locations, Zones 1 and 2

**Custody Transfer**

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<th>Liquid</th>
<th>Gas</th>
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<td>Single</td>
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**Non-Custody Transfer**

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<tr>
<th></th>
<th>Liquid</th>
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<td>UFM 3030</td>
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**Coming soon!**

**OPTISONIC 1060/2060**

Single and dual beam gas flowmeters for the process industry.

- Higher accuracy for more demanding applications
- Improved signal processing
- Wider application range to replace mechanical gas flow meters and even better cost of ownership
Special meters

UFM 610 P Clamp-on meter
Efficient flowmetering and volume measurement of clean, homogeneous liquids with low gas and solids contents.
This portable, low-power consumption meter is easy to attach, non-contact, and does not require process turn-down.
- Demineralized water for cooling purposes
- Boiler feedwater in power stations
- Pretreated wastewater in sewage plants
- Checking other flowmeters
- Oil, acids, alkaline solutions

UFM 800 W
weld-on sensors
This product is ideal for retrofitting ultrasonic sensors for measurement in already installed pipelines. The quality of the sensors is the same as the used in all KROHNE ultrasonic flowmeters. Channel-mount UFM 800 C is also available.
- Long working life
- Over 30,000 sensor pairs in everyday use
- Suitable for non-interuptive retrofitting using hot-tapping

Hot-Tapping with UFM 800 W
- Attach hot-tap valve to pipeline
- Fit hot tap drilling unit
- Open valve, bore through pipe, pressure fit the sensor, remove the drilling unit and wire up.

KROHNE Calibration
All KROHNE flowmeters are wet-calibrated. We set the highest standard in quality control, reliability, accuracy and reproducibility. The result is a guarantee for excellent measuring results with each and every KROHNE flowmeter.
All KROHNE production facilities worldwide have calibration stands that fulfill international industrial standards.

Coming soon!
OPTIPHASE
Sonar-based clamp-on flowmeter

OPTIPHASE 1000
Flowspeed monitoring system
OPTIPHASE 2000
Gas volume fraction monitoring system
OPTIPHASE 3000
Combined flow speed and gas volume fraction monitoring system.
- All the advantages of an ultrasonic clamp-on flowmeter
- With less surface preparation
- Higher accuracy from dedicated pipe diameter body