

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



American Petroleum Institute



Process meters (non-custody transfer)



Advantages over mechanical meters:

- Long term stability and high reliability
- Lower operational and maintenance costs
- At an attractive price



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

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.

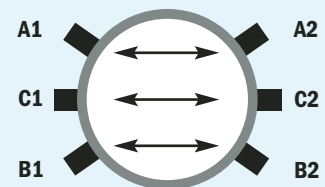
- Metering of low-conductivity liquids, including solvents and raw materials
- Metering of cooling water
- Metering of demineralized water
- Inline flow measurement in pipelines for oil and gas products
- High dynamic range
- Multiple parameter outputs
- Bi-directional flow measurement

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.



	Custody Transfer		
	Liquid Multi	Liquid Single	Gas Multi/Single
ALTOSONIC III		◆	
ALTOSONIC IV			◆
ALTOSONIC V	◆		
	Non-Custody Transfer		
	Liquid		Gas
UFM 3030	◆		
GFM 700			◆
UFM 610	◆		
UFM 800	◆		
OPTISONIC 1060			◆
OPTISONIC 2060			◆

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 800 W weld-on sensors

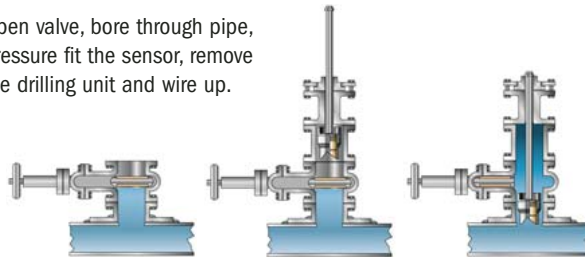
This product is ideal for retrofitting ultrasonic sensors for measurement in already installed pipelines. The quality of the sensors is the same as the used in all KROHNE ultrasonic flowmeters. Channel-mount UFM 800 C is also available.



- Long working life
- Over 30,000 sensor pairs in everyday use
- Suitable for non-interruptive 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.



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



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

United Kingdom

KROHNE Ltd.
Rutherford Drive, Park Farm Industrial Estate,
Wellingborough, Northants NN8 6AE, UK
TEL.: +44(0)19 33-408 500
FAX: +44(0)19 33-408 501
e-mail: info@krohne.co.uk

USA

KROHNE Inc.
7 Dearborn Road
Peabody, MA 01960
TEL.: +1-978 535 -6060
FAX: +1-978 535 -1720
e-mail: info@krohne.com

International

KROHNE Messtechnik GmbH & Co. KG
Ludwig-Krohne-Str. 5
D-47058 Duisburg
TEL.: +49(0)203-301-0
FAX: +49(0)203-301-389
e-mail: info@krohne.de

KROHNE