FLEXIM

FLEXIM - Flexible Industrial Measurement

PRODUCT CATALOGUE

Clamp-on ultrasonic flow measurement and process analytics

Non-intrusive flow measurement with FLUXUS®

- → Liquids
- → Gases
- → Thermal energy

Non-intrusive process analytics with PIOX® S

- → Concentration
- → Density
- → Mass flow rate

PIOX® R process refractometer

- → Concentration
- → Density
- → ° Brix etc.

Contents

FLEXIM

FLEXIM

Flexible Industrial Measurement Technology

Measurement technology made in Berlin – used worldwide

FLEXIM develops, manufactures, and sells advanced process measuring devices for industrial applications. For more than 20 years, non-intrusive ultrasonic flow measurement has its name: FLUXUS®. The name PIOX® stands for process analytics – non-intrusive with the PIOX® S ultrasonic analyser, wetted with the PIOX® R transmitted light refractometer.

If it flows, FLUXUS® will measure it.

FLEXIM's FLUXUS® ultrasonic flowmeters are used wherever something flows. Non-intrusive clamp-on ultrasonic technology opens up an unrivalled wide range of applications. FLUXUS® reliably measures on very small tubes (e.g. DN 6 tubes in paint finishing systems) and very large pipes (e.g. DN 6500 downpipes in hydropower plants).

The field of application is not only limited to liquids. FLEXIM is also particularly proud of its pioneering work carried out in transferring ultrasonic technology to the non-intrusive flow measurement of gases. Clamp-on measuring technology also covers an extraordinary range of applications in this area – from the recording of quantities drawn off by individual pneumatic consumers in a compressed air network, to the non-intrusive measurement of gas quantities conveyed in a gas transmission pipeline.

Progressive process analytics with PIOX®

Clamp-on ultrasonic technology can also be used for process analytics through non-intrusive determination of the acoustic velocity in the medium. PIOX® S ultrasonic systems really stand the test in applications where wetted measuring equipment is subject to considerable wear and tear, for example during concentration and mass flow measurements of acids.

Measurement of light refraction is a proven method for determining concentrations. Laboratory accuracy is ensured in the process with the patented PIOX® R transmitted light refractometer.

If both measuring methods are combined, multi-component mixtures can also be analysed accurately and reliably.

FLUXUS®

Non-intrusive flow measurement with clamp-on ultrasonic technology

FLUXUS® measures flow rates non-intrusively with ultrasound. Clamp-on ultrasonic transducers are simply mounted on the outside of the pipe. The practical advantages are obvious: no wear and tear by the medium flowing inside the pipe, no risk of liquid leakage or fugitive gas emissions, no pressure loss and, above all, unlimited plant availability.

FLUXUS® measures the difference

FLUXUS® clamp-on ultrasonic systems determine the volume flow according to the transit-time difference method: since the ultrasonic signal that is injected into the pipe is carried by the medium flowing inside, a time delay occurs between the acoustic transit time both with and against the flow direction. This time delay can be measured very accurately. The measuring transmitter calculates the volume flow rate based on the parameters input for the pipe geometry and the physical properties of the medium stored in the internal database.

FLUXUS® clamp-on ultrasonic systems allow for the flow measurement of almost all liquid and gaseous media – even those with increased inputs of solids and gas (<10%) or even wet gas (LVF <5%).

Versatile clamp-on solution

The non-intrusive acoustic measuring method is inertia-free and is characterised by very high measuring dynamics in both flow directions. When combined with density measurement, the transit-time difference measurement is suitable for determining the volume flow rate and mass flow rate of liquids. When combined with pressure measurement, it is suitable for determining the standard volume flow of gases. A particularly practical use for the non-intrusive measuring technique is the fact that the current power of liquid-based thermal consumers, e.g. heating or cooling systems, can be easily recorded.

As a technology leader in clamp-on ultrasonic systems, FLEXIM has developed two sensor technologies for non-intrusive flow measurement: shear wave transducers for the flow measurement of liquids and Lamb wave transducers for the flow measurement of gases. By means of these two technologies and the internal, automatic compensation of varying ambient temperatures, FLEXIM ensures maximum measuring accuracy and reliability, even under difficult conditions.

FLEXIM

FLEXIM

Flexible Industrial Measurement

Fundamentally flexible

Non-intrusive clamp-on technology offers maximum flexibility and the sophisticated electronics of FLUXUS® ensure the highest degree of reliability. The measuring system, which consists of a transmitter and VARIOFIX transducer system, can be adapted optimally to specific requirements.

The product range of the FLUXUS® series covers a wide spectrum of various measuring transmitters and transducers, from basic devices for standard applications to measuring systems for usage offshore. It goes without saying; this also includes transmitters and transducers which can be used in potentially explosive areas as well as in applications where a SIL2 qualification is needed.

Proven accuracy

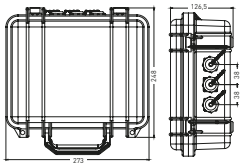
The reliability and accuracy of measuring systems depend on the quality of their manufacturing and calibration. Consistent quality management according to DIN ISO 9001 is absolutely essential for FLEXIM. From the moment the goods arrive at the warehouse to the moment the finished measuring system is shipped, operational checks are carried out at every single production stage and everything is documented. Paired transducers ensure high measuring accuracy of the measuring systems.

Calibration is carried out on individual calibration equipment according to national standards. FLEXIM calibrates pairs of transducers and measuring transmitters independently of one another so that the narrowly defined measurement uncertainties are always observed, regardless of which transducers are used with which measuring transmitters.

Portable Flow Meters FLUXUS® F401 and F601

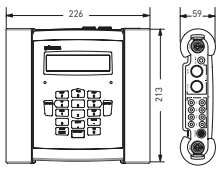
Liquids & Thermal Energy

FLUXUS® F401	The portable FLUXUS® F401 is a single channel meter for the flow measurement of water and wastewater streams (<6 % of solid / gas content by volume). It is equipped with IP68 transducers and housed in an IP67 enclosure for long term remote measurements outdoor.
Calibrated accuracy:	± 2.0 % of rd. ± 0.01 m/s
Operating temp.:	-10 °C ... +50 °C (Transmitter)
Pipe wall temp.:	-40 °C ... +100 °C
Pipe size (ID):	25 ... 3100 mm



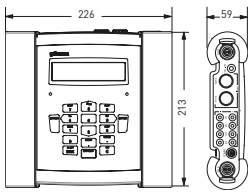
Inputs:	--
Outputs:	1x Current, 1x Binary
Battery life:	>24 hrs. battery supplied measurement, with add. battery suitcase >1 week
Flow velocity:	0.01 m/s ... 25 m/s
Degree of protection:	IP67 (Transmitter), IP68 (Transducers)

FLUXUS® F601	The portable FLUXUS® F601 is the ideal metering solution for flexible operation during temporary control and service tasks on all liquid filled pipes independent of the flowing medium.
Accuracy:	± 1.2 % of rd. ± 0.01 m/s, ± 0.5 % of rd. ± 0.01 m/s (process calibrated)
Operating temp.:	-10 °C ... +60 °C (Transmitter)
Pipe wall temp.:	-40 °C ... +200 °C (-190 °C ... +600 °C with WaveInjector®)
Pipe size (ID):	6 mm ... 6500 mm



Inputs:	-
Outputs:	2x Current, 2x Binary
Battery life:	> 17 hrs. battery supplied measurement
Flow velocity:	0.01 m/s ... 25 m/s
Degree of protection:	IP65 (Transmitter), Transducers up to IP68

FLUXUS® F601 Energy	The portable FLUXUS® F601 Energy is the ideal metering solution for flexible operation during temporary control of liquid flows, associated service tasks as well as thermal energy measurements.		
Product variant:	Energy	Double Energy	Multifunctional
Accuracy:	± 1.2 % of rd. ± 0.01 m/s; ± 0.5 % of rd. ± 0.01 m/s (process calibrated)		
Operating temp.:	-10 °C ... +60 °C (Transmitter)		
Pipe wall temp.:	-40 °C ... +200 °C (-190 °C ... +600 °C with WaveInjector®)		
Pipe size (ID):	6 mm ... 6500 mm		



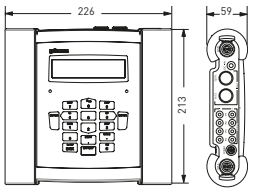
Inputs:	2x Temperature	4x Temperature	2x Temperature, 2x Current
Outputs:	2x Current, 2x Binary	2x Current, 2x Binary	4x Current, 2x Binary
Battery life:	> 17 hrs. battery supplied measurement		
Flow velocity:	0.01 m/s ... 25 m/s		
Degree of protection:	IP65 (Transmitter), Transducers up to IP68		

* with WaveInjector®

Portable Flow Meters FLUXUS® G601

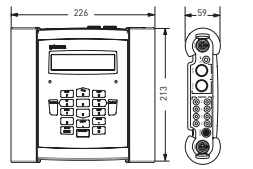
Gases & Thermal Energy

FLUXUS® G601	The portable FLUXUS® G601 is the ideal metering solution for flexible operation during temporary control and service tasks on gas filled pipes.	
Product variant:	(Extended) Standard	Multifunctional
Accuracy:	± 1 ... 3 % of rd. ± 0.01 m/s (application dependent), ± 0.5 % of rd. ± 0.01 m/s (process calibrated)	
Operating temp.:	-10 °C ... +60 °C (Transmitter)	
Pipe wall temp.:	-40 °C ... +80 °C	
Pipe size (ID):	7 mm ... 1600 mm for gases	



Inputs:	(2x Current)	1x Temp., 2x Current, 1x Voltage
Outputs:	2x Current, (1) 2x Binary, 1x Frequency	2x Current, 2x Binary, 1x Frequency
Battery life:	> 17 hrs battery supplied measurement	
Flow velocity:	0.01 m/s ... 35 m/s	
Degree of protection:	IP65 (Transmitter), Transducers up to IP68	

FLUXUS® G601 CA Energy	The portable FLUXUS® G601 CA Energy is the ideal metering solution for flexible operation during temporary control and service tasks. It allows the measurement of liquids, gases (incl. compressed air) and thermal energy quantities combined in one device.
Accuracy: **Liquids:** **Gases:**	 ± 1.2 % of rd. ± 0.01 m/s; ± 0.5 % of rd. ± 0.01 m/s (process calibr.) ± 1 ... 3 % of rd. ± 0.01 m/s (appl.); ± 0.5 % of rd. ± 0.01 m/s (process calibr.)
Operating temp.:	-10 °C ... +60 °C (Transmitter)
Pipe wall temp.:	-40 °C ... +80 °C for gases, -40 °C ... +200 °C (-190 °C ... +600 °C)* for liquids
Pipe size (ID):	7 mm ... 1600 mm for gases; 6 mm ... 6500 mm for liquids

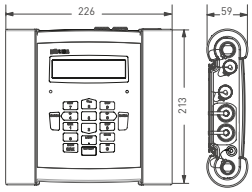


Inputs:	2x Temp., 2x Current
Outputs:	2x Current, 2x Binary
Battery life:	> 17 hrs battery supplied measurement
Flow velocity:	0.01 m/s ... 35 m/s for gases, 0.01 m/s ... 25 m/s for liquids
Degree of protection:	IP65 (Transmitter), Transducers up to IP68

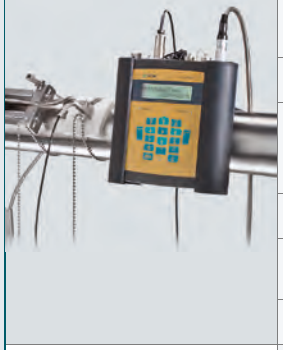
Portable Flow Meter FLUXUS® F608

Liquids & Thermal Energy
ATEX (IECEx) Zone 2, FM Class I, Div. 2 certified
(Transducers certified for ATEX (IECEx) Zones 1 and 2, FM Class I, Div. 2)

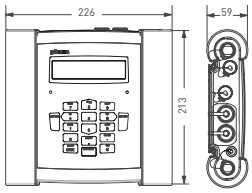
FLUXUS® F608	The portable FLUXUS® F608 is the ideal metering solution for flow measurements on liquid filled pipes located in hazardous areas being ATEX (IECEx) Zone 2 and FM Class I, Div. 2 certified.
Accuracy:	±1.2 % of rd. ± 0.01 m/s, ±0.5 % of rd. ± 0.01 m/s (process calibrated)
Operating temp.:	-10 °C ... +60 °C (Transmitter)
Pipe wall temp.:	-40 °C ... +200 °C (-190 °C ... +600 °C with WaveInjector®)
Pipe size (ID):	6 mm ... 6500 mm



Inputs:	-
Outputs:	2x Current, 2x Binary (only available for ATEX / IECEx Zone 2 approved version)
Battery life:	> 17 hrs. battery supplied measurement
Flow velocity:	0.01 m/s ... 25 m/s
Degree of protection:	IP65, Transducers up to IP68 / ATEX (IECEx) Zone 2, FM Class I, Div. 2



FLUXUS® F608 Energy	The portable FLUXUS® F608 Energy is the ideal liquid flow as well as thermal energy metering solution for applications located in hazardous areas being ATEX (IECEx) Zone 2 and FM Class I, Div. 2 certified.	
Product variant:	Energy	Double Energy
Accuracy:	±1.2 % of rd. ± 0.01 m/s, ±0.5 % of rd. ± 0.01 m/s (process calibrated)	
Operating temp.:	-10 °C ... +60 °C (Transmitter)	
Pipe wall temp.:	-40 °C ... +200 °C (-190 °C ... +600 °C with WaveInjector®)	
Pipe size (ID):	6 mm ... 6500 mm	

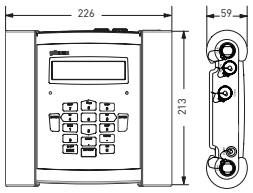


Inputs:	2x Temperature	4x Temperature
Outputs:	2x Current, 2x Binary (only available for ATEX / IECEx Zone 2 approved version)	
Battery life:	> 17 hrs. battery supplied measurement	
Flow velocity:	0.01 m/s ... 25 m/s	
Degree of protection:	IP65, Transducers up to IP68 / ATEX (IECEx) Zone 2, FM Class I, Div. 2	

Portable Flow Meters FLUXUS® G608

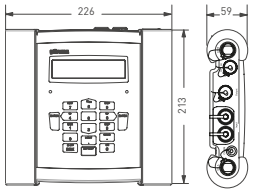
Gases & Thermal Energy
ATEX (IECEx) Zone 2, FM Class I, Div. 2 certified
(Transducers certified for ATEX (IECEx) Zones 1 and 2, FM Class I, Div. 2)

FLUXUS® G608	The portable FLUXUS® G608 is the ideal metering solution for flow measurements on gas pipes located in hazardous areas being ATEX (IECEx) Zone 2 and FM Class I, Div. 2 certified.
Accuracy:	±1 ... 3 % of rd. ± 0.01 m/s (application dependent), ± 0.5 % of rd. ± 0.01 m/s (process calibrated)
Operating temp.:	-10 °C ... +60 °C (Transmitter)
Pipe wall temp.:	-40 °C ... +80 °C
Pipe size (ID):	7 mm ... 1600 mm



Inputs:	-
Outputs:	2x Current, 2x Binary (only available for ATEX / IECEx Zone 2 approved version)
Battery life:	> 17 hrs. battery supplied measurement
Flow velocity:	0.01 m/s ... 35 m/s
Degree of protection:	IP65, Transducers up to IP68 / ATEX (IECEx) Zone 2, FM Class I, Div. 2

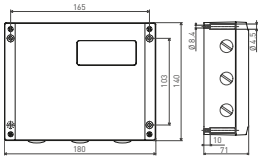
FLUXUS® G608 CA Energy	The portable FLUXUS® G608 CA Energy is a meter that can measure liquid and gas (incl. compressed air) flow rates as well as quantify thermal energy flows. It is specifically designed for use in hazardous areas and thus ATEX (IECEx) Zone 2 and FM Class I, Div. 2 certified.
Accuracy Liquids: Gases:	 ± 1.2 % of rd. ± 0,01 m/s; ± 0,5 % of rd. ± 0.01 m/s (process calibrated) ± 1 ... 3 % of rd. ± 0,01 m/s (appl.); ± 0.5 % of rd. ± 0,01 m/s (process calibr.)
Operating temp.:	-10 °C ... +60 °C (Transmitter)
Pipe wall temp.:	-40 °C ... +200 °C (-190 °C ... +600 °C with WaveInjector®) for liquids -40 °C ... +80 °C for gases
Pipe size (ID):	6 mm ... 6500 mm for liquids; 7 mm ... 1600 mm for gases



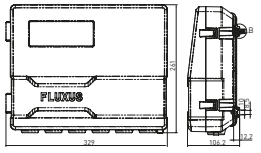
Inputs:	4x Temperature
Outputs:	2x Current, 2x Binary (Outputs only available for ATEX / IECEx Zone 2 approved version)
Battery life:	> 17 hrs. battery supplied measurement
Flow velocity:	0.01 m/s ... 25 m/s (for liquids); 0.01 m/s ... 35 m/s (for gases)
Degree of protection:	IP65, Transducers up to IP68 / ATEX (IECEx) Zone 2, FM Class I, Div. 2

Stationary Transmitters

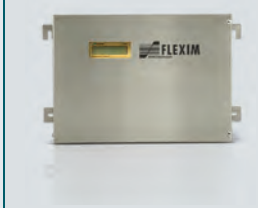
Liquids (F) and Thermal Energy (F BTU, F Energy)
Non-ex and ATEX (IECEx) Zone 2, FM Class I, Div. 2 approved

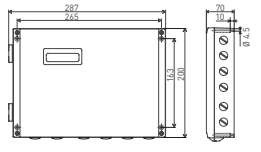


FLUXUS® F50X	The FLUXUS® F50X is a basic meter available in dedicated solution packages for water, thermal energy and flexible tubing applications. The basic meter FLUXUS® F501 is designed for water and water / glycol applications.		
Product variant:	F501 IP (buried water pipes)	F502 BTU (thermal energy meter)	F501 Semiconductor (for liquids in tubes)
Accuracy:	± 1.6 % of rd. ± 0.01 m/s	±2 % of rd. ± 0.01 m/s	± 2 % of rd. ± 0.01 m/s
Operating temp.:	-10 °C ... +60 °C		
Pipe wall temp.:	-40 °C ... +100 °C		
Pipe size (ID):	25 mm ... 3100 mm	10 mm ... 2500 mm	OD: 3/8", 1/2", 3/4", 1", 1,25"
Inputs:	-	2x Temperature	-
Outputs:	1x Current, 2x Binary	2x Current, 2x Binary	2x Current, 2x Binary
Power supply:	100 V ... 240V / 50 ... 60 Hz or 20 ... 32 V DC		
Communication:	RS485 (emitter) or Modbus RTU or BACnet MS/TP or M-Bus (meter dependent)		
Flow velocity:	0.01 m/s ... 25 m/s		
Degree of protection:	IP 66 (Transducers IP68)	IP 66	IP 66



FLUXUS® F721 **FLUXUS® F721 Energy**	The non-intrusive FLUXUS® F721 ultrasonic flow meters are FLEXIM's most advanced liquid and thermal energy meters. Engineered for highly precise measurements under all circumstances, they are the state-of-the art flow meters.	
	FLUXUS® F721	FLUXUS® F721 Energy
Accuracy:	± 1.2 % of rd. ± 0.01 m/s, ± 0.5 % of rd. ± 0.01 m/s (field calibrated)	
Operating temp.:	-40 °C ... +60 °C	
Pipe wall temp.:	-40 °C ... +200 °C (-190 °C ... +600 °C)*	
Pipe size (ID):	6 mm ... 6500 mm	
Inputs:	maximum 4, possible are: Temp. (Pt 100/1000 4-Loop), Current, Voltage, Binary	
Outputs:	maximum 7, possible are: Current, Voltage, Frequency, Binary USB and Ethernet interfaces available	
Power supply:	100 ... 240 V / 50 ... 60 Hz or 20 ... 32 V DC	
Communication:	HART, Modbus, BACnet, Foundation Fieldbus, Profibus PA, RS485, (M-Bus)	
Flow velocity:	0.01 m/s ... 25 m/s	
Degree of protection:	IP66, ATEX (IECEx) Zone 2, FM Class I, Div. 2, Inmetro, EAC TR-TS optional (**)	





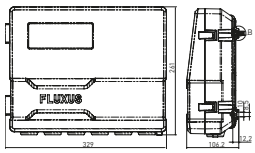
FLUXUS® F706	The non-intrusive 4 Beam ultrasonic liquid flow meter FLUXUS® F706 offers highest precision and is used for control and redundancy measurements of custody transfer meters or for usage in protective systems for leak detection.
Accuracy:	± 1 % of rd. ± 0.01 m/s, better than ± 0.5 % of rd. ± 0.01 m/s (field calibrated)
Operating temp.:	-40 °C ... +60 °C
Pipe wall temp.:	-40 °C ... +200 °C
Pipe size (ID):	6 mm ... 6500 mm
Inputs:	maximum 4, possible are: Temp. (Pt 100/1000 4-Loop), Current, Voltage
Outputs:	maximum 4, possible are: (active/passive) Current, Voltage, Frequency, Binary
Power supply:	100 ... 240 V / 50 ... 60 Hz or 20 ... 32 V DC
Communication:	HART, Modbus RTU, RS485
Flow velocity:	0.01 m/s ... 25 m/s
Degree of protection:	IP66, opt. ATEX (IECEx) Zone 2, FM Class I, Div. 2

* with WaveInjector®

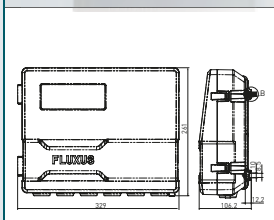
** SIL2 approved products are available®

Stationary Transmitters

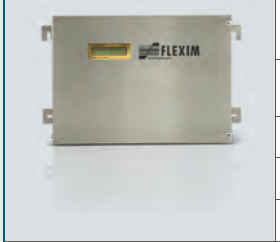
Water (WD) and Gases (G)
Non-ex and ATEX (IECEx) Zone 2, FM Class I, Div. 2 approved

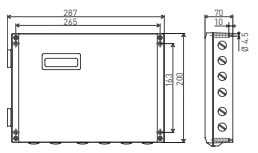


FLUXUS® WD	The FLUXUS® WD series is the ideal flow metering solution for water suppliers. With their IP68 rated transducers the measurement system can easily be buried underground and works on even the most difficult pipes.			
Product variant:	WD100 / WD200	WD400	WD1200	WD6500
Accuracy:	± 1.5 % of rd. ± 0.01 m/s	±1.2 % of rd. ± 0.01 m/s		
Operating temp.:	-10 °C ... +60 °C			
Pipe wall temp.:	-40 °C ... +100 °C			
Pipe size (ID):	50 ... 100 mm and 100 ... 200 mm	200 ... 400 mm	400 ... 1200 mm	1200 ... 6500 mm
Outputs:	1x Current, 2x Binary			
Power supply:	100 V ... 240V / 50 ... 60 Hz or 20 ... 32 V DC			
Communication:	RS485 or Modbus or BACnet or M-Bus or Profibus PA or Foundation Fieldbus			
Flow velocity:	0.01 m/s ... 25 m/s			
Degree of protection:	IP66 (Transducers IP68)			



FLUXUS® G721	The non-intrusive FLUXUS® G721 ultrasonic gas flow meter is FLEXIM's most advanced gas flow meter. Engineered for highly precise measurements under all circumstances, it is the state-of-the flow meter for any gaseous medium.
Accuracy:	± 1...3 % of rd. ± 0.01 m/s (application dependent), ± 0.5 % of rd. ± 0.01 m/s (field calibrated)
Operating temp.:	-40 °C ... +60 °C
Pipe wall temp.:	-40 °C ... +80 °C
Pipe size (ID):	7 mm ... 1600 mm
Inputs:	maximum 4, possible are: Temp. (Pt 100/1000 4-Loop), Current, Voltage, Binary
Outputs:	maximum 7, possible are: Current, Voltage, Frequency, Binary USB and Ethernet interfaces available
Power supply:	100 ... 240 V / 50 ... 60 Hz or 20 ... 32 V DC
Communication:	HART, Modbus, BACnet, Foundation Fieldbus, Profibus PA, RS485, (M-Bus)
Flow velocity:	0.01 m/s ... 35 m/s
Degree of protection:	IP66, ATEX (IECEx) Zone 2, FM Class I, Div. 2, Inmetro, EAC TR-TS optional (**)





FLUXUS® G706	The non-intrusive 4 Beam ultrasonic gas flow meter FLUXUS® G706 offers highest precision and is used for control and redundancy measurements of custody transfer meters or for usage in protective systems for leak detection.
Accuracy:	± 1 % ... 3% of rd. ± 0.01 m/s (application dependent), better than ± 0.5 % of rd. ± 0.01 m/s (field calibrated)
Operating temp.:	-40 °C ... +60 °C
Pipe wall temp.:	-40 °C ... +80 °C
Pipe size (ID):	7 mm ... 1600 mm
Inputs:	maximum 4, possible are: Temp. (Pt 100/1000), Current, Voltage
Outputs:	maximum 4, possible are: (active/passive) Current, Voltage, Frequency, Binary
Power supply:	100 ... 240 V / 50 ... 60 Hz or 20 ... 32 V DC
Communication:	HART, Modbus RTU, RS485
Flow velocity:	0.01 m/s ... 35 m/s
Degree of protection:	IP66, opt. ATEX (IECEx) Zone 2, FM Class I, Div. 2

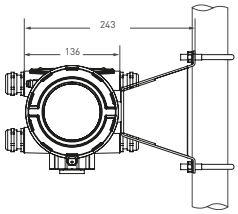
Stationary Transmitters

Liquids (F)
ATEX (IECEx) Zone 1, FM Class I, Div. 1 approved

FLUXUS® F808

The FLUXUS® F808 is an ATEX (IECEx) Zone1 and FM Class I, Div. 1 / 2 approved single channel liquid flow meter. As special product variant „FLUXUS® XLF", it is engineered to measure extremely low flows.

	FLUXUS® F808	FLUXUS® XLF
Accuracy:	± 1.2 % of rd. ± 0.01 m/s, ± 0.5 % of rd. ± 0.01 m/s (field calibr.)	± 10 % of reading and better for volume flow rates down to and below 3 l/h
Operating temp.:	-30 °C ... (+50) +60 °C	
Pipe wall temp.:	-40 °C ... +200 °C	
Pipe size (ID):	6 mm ... 6500 mm	10 mm to 50 mm

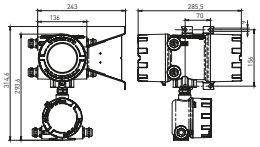


Inputs:	-
Outputs:	2 (various combinations between Current and Binary ouputs available)
Power supply:	100 ... 240 V / 50 ... 60 Hz or 20 ... 32 V DC
Communication:	HART, Modbus
Flow velocity:	0.01 m/s ... 25 m/s down to and below 3 l/h
Degree of protection:	IP66, ATEX (IECEx) Zone 1, FM Class I, Div. 1 / 2, (SIL2 with ADM8027)

FLUXUS® F809

The FLUXUS® F809 is an ATEX (IECEx) Zone1 and FM Class I, Div. 1 / 2 approved dual channel liquid flow meter for any industrial environment. It can even be empoyed at extreme from -190 °C up to +600°C.

Accuracy:	± 1.2 % of rd. ± 0.01 m/s, ± 0.5 % of rd. ± 0.01 m/s (field calibrated)
Operating temp.:	-30 °C ... (+50) +60 °C
Pipe wall temp.:	-40 °C ... +200 °C (-190 °C ... +600 °C)*
Pipe size (ID):	6 mm ... 6500 mm

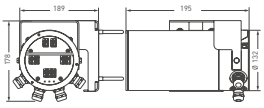


Inputs:	-
Outputs:	4 (various combinations between Current and Binary outputs available)
Power supply:	100 ... 240 V / 50 ... 60 Hz or 20 ... 32 (11 ... 16) V DC or (FLUXUS ADM 8027 / G800: 24 V DC ±10 % with outputs: increased safety)
Communication:	HART, Modbus
Flow velocity:	0.01 m/s ... 25 m/s
Degree of protection:	IP66, ATEX (IECEx) Zone 1, FM Class I, Div. 1 / 2 (SIL2 with ADM8027&G800))

FLUXUS® F801

The clamp-on ultrasonic liquid flow meters FLUXUS®F801 are, with their highly corrosion resistant stainless steel enclosures, the ideal meters for usage offshore (ATEX / IECEx Zone 1 certified).

Accuracy:	± 1.2 % of rd. ± 0.01 m/s, ± 0.5 % of rd. ± 0.01 m/s (field calibrated)
Operating temp.:	-10 °C ... (+50) +60 °C
Pipe wall temp.:	-40 °C ... +200 °C (-190 °C ... +600 °C)*
Pipe size (ID):	6 mm ... 6500 mm



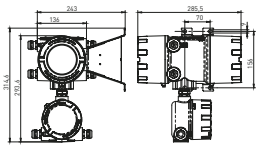
Inputs:	-
Outputs:	1 ... 2x Current, 1 ... 4x Binary, (1x Frequency)
Power supply:	100 ... 240 V / 50 ... 60 Hz oder 20 ... 32 V DC or 11 ... 16 V DC or 24 V DC ±10 % (with outputs: increased safety)
Communication:	HART, Modbus
Flow velocity:	0.01 m/s ... 25 m/s
Degree of protection:	IP66, ATEX (IECEx) Zone 1, SIL2

* with WaveInjector®

Stationary Transmitters

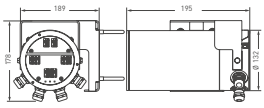
Gases (G)
ATEX (IECEx) Zone 1, FM Class I, Div. 1 approved

FLUXUS® G809	The FLUXUS® G809 is an ATEX (IECEx) Zone1 and FM Class I, Div. 1 / 2 approved dual channel gas flow meter for any industrial environment. It accurately and reliably measures any gaseous medium.
Accuracy:	± 1 ... 3 % of rd. ± 0.01 m/s (application dependent), ± 0.5 % of rd. ± 0.01 m/s (field calibrated)
Operating temp.:	-30 °C ... (+50) +60 °C
Pipe wall temp.:	-40 °C ... +80 °C
Pipe size (ID):	7 mm ... 1600 mm



Inputs:	-
Outputs:	4 (various combinations between Current and Binary outputs available)
Power supply:	100 ... 240 V / 50 ... 60 Hz or 20 ... 32 (11 ... 16) V DC or (FLUXUS ADM 8027 / G800: 24 V DC ±10 % with outputs: increased safety)
Communication:	HART, Modbus
Flow velocity:	0.01 m/s ... 35 m/s
Degree of protection:	IP66, ATEX (IECEx) Zone 1, FM Class I, Div. 1 / 2 (SIL2 with ADM8027&G800))

FLUXUS® G801	The clamp-on ultrasonic gas flow meters FLUXUS® G801 are, with their highly corrosion resistant stainless steel enclosures, the ideal meters for usage offshore (ATEX / IECEx Zone 1 certified).
Accuracy:	± 1 ... 3 % of rd. ± 0.01 m/s (application dependent), ± 0.5 % of rd. ± 0.01 m/s (field calibrated)
Operating temp.:	-10 °C ... (+50) +60 °C
Pipe wall temp.:	-40 °C ... +80 °C
Pipe size (ID):	7 mm ... 1600 mm



Inputs:	-
Outputs:	1 ... 2x Current, 1 ... 4x Binary, (1x Frequency)
Power supply:	100 ... 240 V / 50 ... 60 Hz oder 20 ... 32 V DC or 11 ... 16 V DC or 24 V DC ±10 % (with outputs: increased safety)
Communication:	HART, Modbus
Flow velocity:	0.01 m/s ... 35 m/s
Degree of protection:	IP66, ATEX (IECEx) Zone 1, SIL2

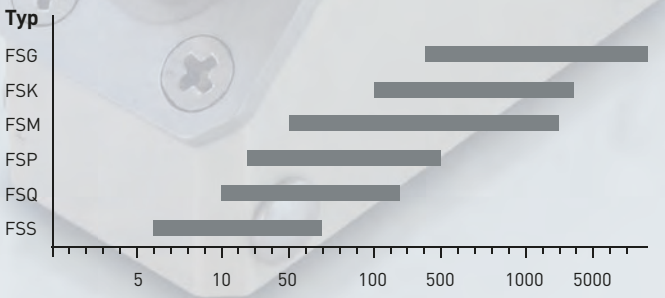
Clamp-On Ultrasonic Transducers

For the flow measurement of liquids

FLEXIM has developed two transducer technologies in order to ensure the highest possible measuring accuracy even in challenging environments: shear wave transducers with a focused signal insertion for measuring liquids and Lamb wave transducers with a wide signal insertion into the medium for measuring the flow of gases.

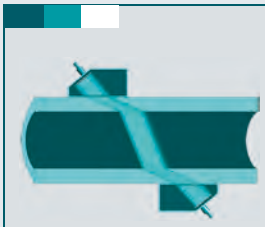
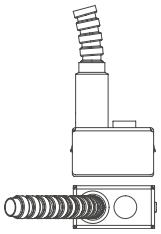
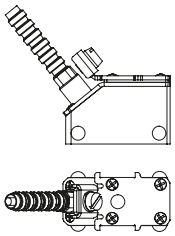
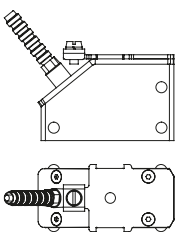
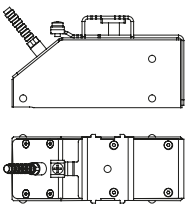
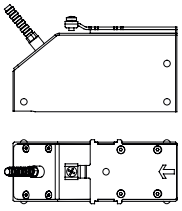
In order to guarantee measurements with long-term stability in harsh industrial environments, the transducers and cable connections are made of stainless steel and are available in explosion-proof designs.

Shear wave Transducers



Inner pipe diameter in mm

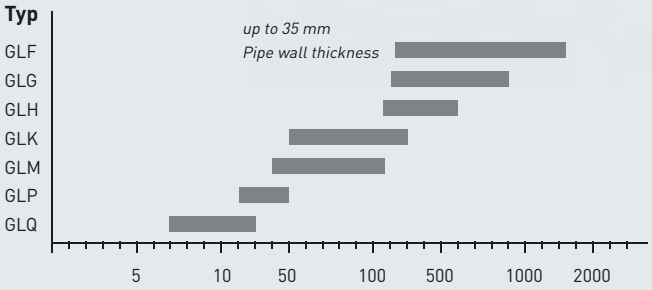
(no limitations by pipe wall thickness or pipe wall material)

					
Shear wave transducers for liquids:	**FSS**	**FSQ** (also available as metal free product variant)	**FSP / FSM**	**FSK**	**FSG**
Techn. drawing:					
Dimensions of standard transducers in mm (l x w x h):	25 x 13 x 17	39 x 22 x 25.5	62.5 x 32 x 40.5	126.5 x 51 x 67.5	129.5 x 51 x 67
Operating temp.: (ext. temp. area):	-30 °C ... +130 °C	-40 °C ... +130 °C (-30 °C ... +200 °C)	-40 °C ... +130 °C (-30 °C ... +200 °C)	-40 °C ... +130 °C	-40 °C ... +130 °C
Protection degree:	IP65	IP65, IP67 optional	IP65, IP68 optional	IP65, IP68 optional	IP65, IP68 optional
Hazardous area approval:	FM Class I, Div. 2	ATEX (IECEx) Zone 1 and 2 FM Class I, Div. 1 / 2	ATEX (IECEx) Zone 1 and 2 FM Class I, Div. 1 / 2	ATEX (IECEx) Zone 1 and 2 FM Class I, Div. 1/ 2	ATEX (IECEx) Zone 1 and 2 FM Class I, Div. 1 / 2

Clamp-On Ultrasonic Transducers

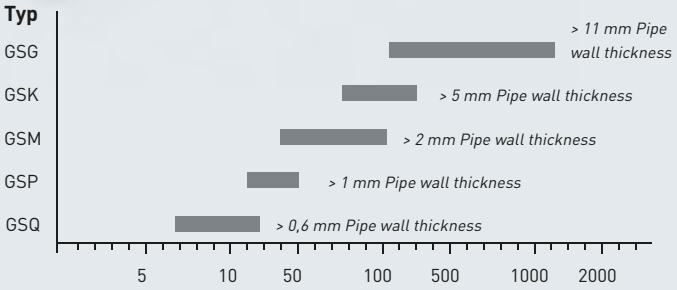
For the flow measurement of gases

Lamb wave Transducers



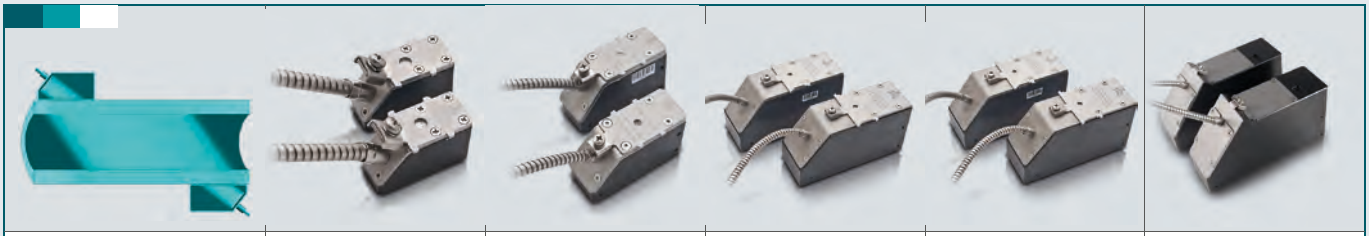
Inner pipe diameter in mm

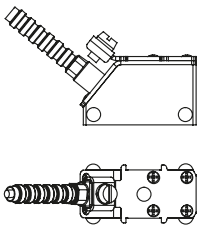
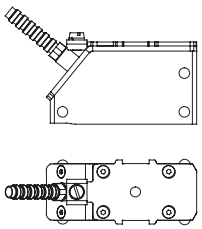
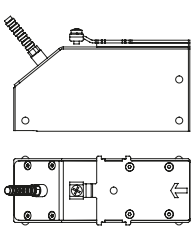
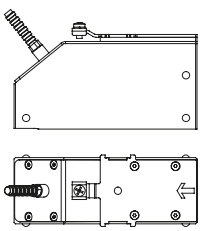
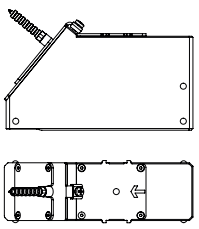
Shear wave Transducers*



Inner pipe diameter in mm

**Applications with pipe wall thicknesses that are not within the range of Lamb wave transducers*



Lamb wave transd. Shear wave transd.* for gases:	**GLQ -**	**GLP / GLM GSP / GSM**	**GLH / GLK GSK**	**GLG GSG**	**GLF -**
Techn. drawing:					
Dimensions of standard transducers in mm (l x w x h):	42 x 22 x 25.5	74 x 32 x 40.5	128.5 x 51 x 67.5	128.5 x 51 x 67.5	163 x 54 x 91.3
Operating temp.:	-40 °C ... +170 °C	-40 °C ... +170 °C	-40 °C ... +170 °C	-40 °C ... +170 °C	-40 °C ... +170 °C
Protection degree:	IP65, IP68 optional	IP65, IP68 optional	IP65, IP68 optional	IP65, IP68 optional	IP65
Hazardous area approval:	ATEX (IECEx) Zone 1 and 2 FM Class I, Div. 1 / 2	ATEX (IECEx) Zone 1 and 2 FM Class I, Div. 1 / 2	ATEX (IECEx) Zone 1 and 2 FM Class I, Div. 1 / 2	ATEX (IECEx) Zone 1 and 2 FM Class I, Div. 1 / 2	ATEX (IECEx) Zone 1 and 2 FM Class I, Div. 1 / 2

*** dimensions and design are varying to the Lamb wave transducers**

Transducer Mounting Fixtures

Whether for quick installations during temporary measurement or for permanent installations, whether for large pipes or small tubes: FLEXIM offers the right transducer mounting fixture for every application.

VARIOFIX transducer systems offer the best stability: the sturdy mounting devices permanently ensure the ultrasonic transducers are positioned precisely. Sophisticated, constructive details guarantee constantly high contact pressure even with high fluctuations in temperature thereby ensuring long-term stable high signal quality.

VARIOFIX L is the standard transducer mounting fixture for permanent installation. VARIOFIX C provides optimum protection even under the harshest conditions: below the stainless steel cover, the measuring point is permanently protected from external influences, from wind and weather as well as from mechanical damage.

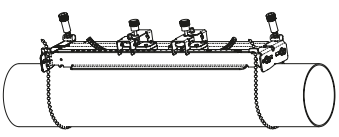
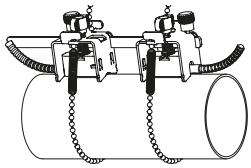
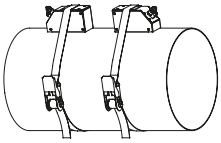
When the going gets tough

FLEXIM invented the WaveInjector® for extreme temperatures. The patented device separates the ultrasonic transducers thermally from the pipe thereby extending the application range of non-intrusive clamp-on ultrasonic technology to temperatures from -190 °C to 600 °C.

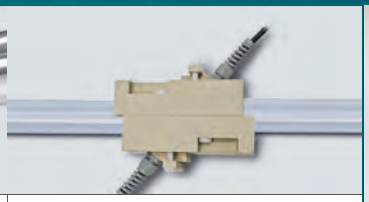
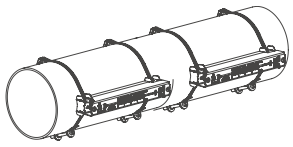
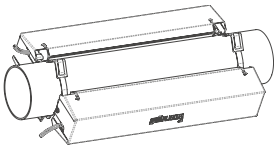
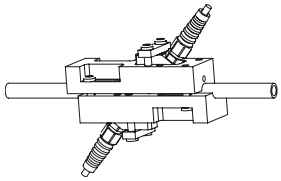
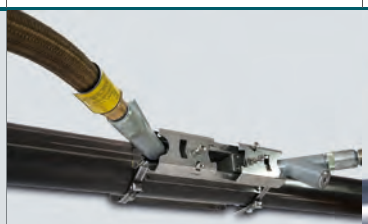
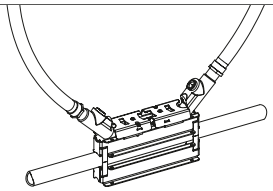
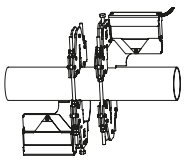
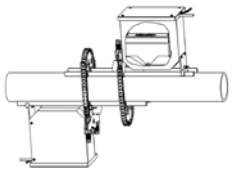
The WaveInjector® is a transducer mounting device and so much heat is radiated or absorbed via its metallic coupling plates that the temperature of the transducer clamping fixture lies within the working range of the ultrasonic transducers.

The WaveInjector® is also mounted on the outside of the pipe without having to open the pipeline. Since it is a purely mechanical arrangement, the WaveInjector® can also be used in hazardous areas.

For temporary measurements

Portable Mounting Fixtures:	**Portable VARIOFIX (Chains / Magnets)**	**Fastening Shoes (FS) (Chains / Magnets)**	**Tension Belts**
Description:	The portable VARIOFIX is the standard mounting fixture for temporary measurements with M and K transducers.	The fastening shoes (FS) are used for temporary measurements with S, Q and M transducers.	The tension belts are used for temporary measurements with K and larger transducers at big pipe sizes.
Techn. drawing:			
Material:	Stainless Steel: 304 (1.4301), 301 (1.4310), 303 (1.4305)	Stainless Steel: 304 (1.4301), 301 (1.4310), 303 (1.4305)	Steel, powder coated and textile tension belt
Dimensions in mm (l x b x h):	414 x 94 x 76 (40)	210 x 32 x 44 for S transducers 420 x 48 x 58 for Q and M transducers	-

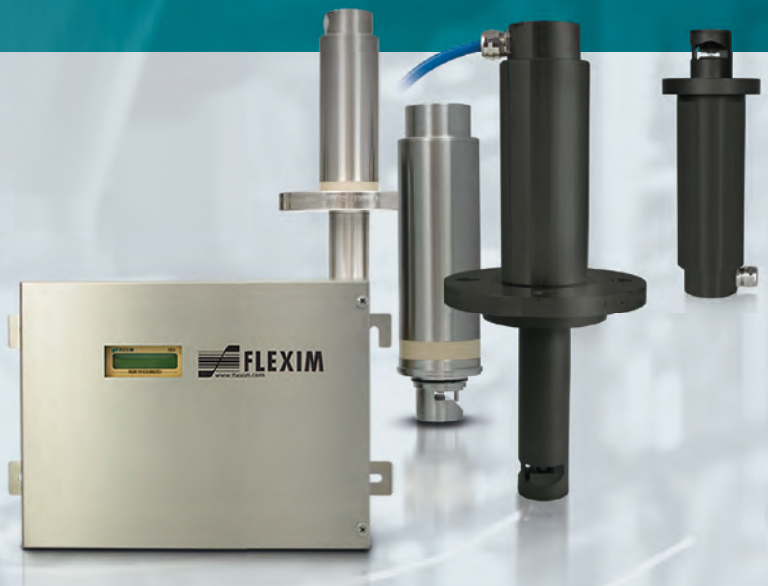
Transducer Mounting Fixtures

For permanent measurements			
			
Mounting Fixture	**VARIOFIX L**	**VARIOFIX C**	**Block fastener**
Description:	The VARIOFIX L is FLEXIM's standard transducer mounting fixture and provides highest mechanical protection within all industrial environments.	The VARIOFIX C is FLEXIM's mounting fixture for especially harsh and corrosive environments, e.g. offshore.	The block mounting fixture is completely metal free and designed for applications at flexible tubings, e.g. to be used in clean room environments.
Techn. drawing:			
Material Standard: Option Offshore:	Stainless Steel: 304 (1.4301), 301 (1.4310) Stainless Steel: 316 (1.4571), 316L (1.4404), 17-7PH (1.4568)	Stainless Steel: 304 (1.4301), 301 (1.4310) Stainless Steel: 316 (1.4571)	Polypropylene (PP)
Dimensions in mm (l x b x h):	VLK: 423 x 90 x 93 VLK opt. IP68: 443 x 94 x 105 VLM: 309 x 57 x 63 VLQ: 247 x 43 x 47	VCK-Large: 560 x 122 x 102 VCK-Large opt. IP68: 560 x 126 x 102 VCK-Small: 410 x 122 x 102 VCK-Small opt. IP68: 410 x 126 x 102 VCM: 460 x 96 x 80 VCQ: 310 x 85 x 62	For outer pipe diameters: 3/8", 1/2", 3/4", 1", 1 1/4" (others on request)
			
Mounting Fixture	**PermaFix**	**WaveInjector®**	**WaveInjector® Cryo**
Description:	The PermaFix fixture is designed for mounting of FM Class I, Div. 1 transducers and associated conduits.	The WaveInjector® is FLEXIM's mounting fixture for extreme pipe wall temperatures for as low as -190 °C up to +600 °C.	**The WaveInjector® Cryo (FLUXUS Cryo) is FLEXIM's mounting fixture for pipe temperatures below -40 °C down to -190 °C**
Techn. Drawing:			
Material:	Stainless Steel: 304 (1.4301), 316 (1.4571) optional	Stainless Steel: 304 (1.4301)	Stainless Steel: 304 (1.4301)
Pipe size:	-	40 mm ... 1000 mm	70 mm ... 1000 mm
Dimensions in mm (l x w x h):	PFK: 410 x 90 x 73 PFM: 310 x 68 x 44	WI-400K: l = 279 mm, h = 178 mm WI-400M, WI-400Q, WI-4001, WI-4004: l = 243 mm, h = 170 mm	l = 2 x l + l_{cp} (l = 273 mm) w = outer pipe diameter + 32 mm h = outer pipe diameter + 570 mm

FLEXIM

PIOX®

Process Analytics by means of Ultrasound and Refractometry



Product characteristics like concentration and density can be monitored continuously online using PIOX® process analysers: non-intrusively with PIOX® S clamp-on ultrasonic systems and wetted with the PIOX® R process refractometer.

PIOX® brings analytics into the process

Both the acoustic measuring method and optical transmitted light measurement basically involve velocities: PIOX® S ultrasonic systems measure the propagation velocity of sound in the medium – also non-intrusively and with the same clamp-on ultrasonic transducers as FLEXIM's FLUXUS® flowmeter.

Due to the fact that density and volume flow are measured simultaneously, PIOX® S ultrasonic systems are particularly suitable for non-intrusively measuring mass flow rates – especially where any leakage risk must absolutely be excluded.

Process insight through transmitted light

Refractometry – measurement of the refraction of light – is a long-established method for determining the concentration, density or purity of liquid media. Refraction results from the change in the propagation velocity of light as it passes from the medium to the measuring prism.

Unlike conventionally used lab instruments, the PIOX® R process refractometer does not determine the refractive index indirectly via the critical angle of the total reflection but directly measures the angle of refraction of two monochromatic beams of light as they pass through the sample stream. The patented differential measurement in the transmitted light method is resistant to the formation of deposits and therefore particularly reliable.

PIOX® S

Process analytics with clamp-on ultrasonic technology

Always on the safe side

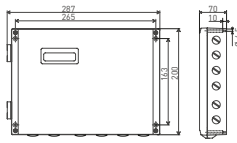
PIOX® S transfers the practical advantages of clamp-on ultrasonic technology to process analytical applications: since the transducers are simply mounted on the – safe – outside of the pipeline, they are not subject to any wear and tear by the medium flowing inside. As there is no need to open the pipe for installation, mounting and initial operation can usually be done during ongoing operation. Non-intrusive process analytics with PIOX® S proves to be just as versatile and flexible as non-intrusive flow measurement with FLUXUS®:

- For almost all pipe sizes and materials – whether it's steel, plastic, glass or special materials with inline or outer coatings, in a nominal size range of 6 mm to 6 m.
- For temperatures up to 400 °C
- For hazardous areas – transducers and transmitters are available in ATEX, IEC and FM-certified designs.

Non-intrusive online analytics with PIOX® S is the method of choice when materials and processes demand the highest levels of safety and reliability, e.g. in the case of corrosive media like acids or alkalis or even toxic compounds.

PIOX® S and FLUXUS® HPI

Ultrasonic process analysers and mass flow meters



PIOX® S (Mass Flow) **FLUXUS® HPI**	PIOX® S can be used to determine the concentration, density and mass flow rate of many chemical media real-time by determination of the acoustic velocity and internal offsetting of the medium temperature. When applying the specific product variant FLUXUS® HPI, it is possible to measure substance-specific data of various hydrocarbons such as the specific density or the API-gravity as well as the volume and mass flow rate. It also allows for direct recognition or differentiation of media which are successively transported through a pipeline.
Accuracy **Mass flow:** **Concentration:** **Density:**	 ± 1.2 % of rd. ± 0.01 m/s (ext. calibr.), ± 0.5 % of rd. ± 0.01 m/s (Process calibr.) up to 0.1 % of reading* up to 0.1 % of reading* *(dependent of medium, temperature and concentration range)
Operating temp. of Transmitter:	-20 °C ... +60 °C Transmitter PIOX® S704 / PIOX S709 -40 °C ... +60 °C Transmitter PIOX® S705 (316L / 1.4404 Stainless Steel enclosure)
Pipe wall temp.:	-40 °C ... +200 °C (-190 °C ... +400 °C with WaveInjector®)
Inputs:	maximum 4, possible are: Temp. (Pt 100/1000 4-Loop), Current, Voltage
Outputs:	Many combinations available, possible types: Current (0/4 mA ... 20 mA), Voltage, Frequency, Impulse, Alarm
Communication protocols:	HART, Modbus, Foundation Fieldbus
Degree of protection Transducers: **Degree of protection Transmitters:**	IP65 to IP68, optional ATEX, IECEx Zone 1 and 2 and FM Class I, Div. 1 / 2 PIOX® S704: IP65,ATEX (IECEx) Zone 2 optional PIOX® S705: IP66, ATEX (IECEx) Zone 2 as well as FM Class I, Div. 2 optional PIOX® S709: IP20,19" Transmitter for operation in racks

PIOX® R

Process analytics with the transmitted light refractometer

Laboratory accuracy in the process

Using PIOX® R, the well-tried transmitted light measurement as a laboratory practice is reliable in the process. Measurement via the patented transmitted light method ensures maximum reliability. Extremely high measuring accuracy is achieved by measuring the refraction of two monochromatic light beams and evaluating the difference.

The PIOX® R comes in two versions, tailored to the requirements of various industries: the PIOX® R400-H for applications where hygiene is particularly important, e.g. in the pharmaceutical, food and drinks industries as well as the PIOX® R400-C for applications in the chemical industry. Both versions are available in various designs, materials and with a variety of flange styles which cover a wide range of applications.

Our application engineers are eager to assist you.

PIOX® R400-H

Process refractometer for hygienic applications

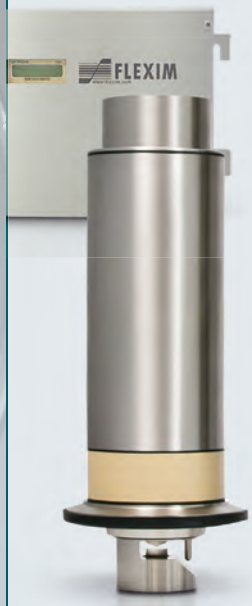
PIOX® R400-H was developed especially for applications which require the highest level of purity and hygiene. The sensor unit is characterised by its cavity-free design which effectively prevents impurities from accumulating.

PIOX® R400-C

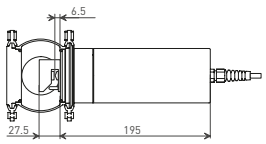
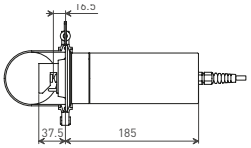
Process refractometer for chemical applications

PIOX® R400-C was developed especially for applications in the chemical industry. The sophisticated design and high-quality materials ensure operational safety even ander challenging conditions, e.g. when measuring highly aggressive media as well as in potentially explosive areas.

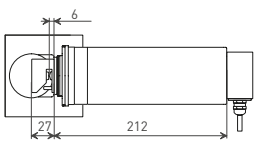
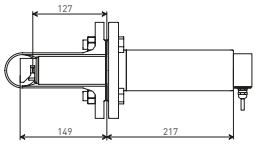
Process Refractometer for Chemical and Hygienic Applications



PIOX® R400 Hygienic design:	The hygienic design of the PIOX® R400 is the ideal process refractometer for applications in the pharmaceutical and food industry. The PIOX® R400 offers maximum process reliability, the highest level of precision and is resistant to deposit formation.
Measurement range:	nD: 1.3 ... 1.7, °Brix: 0 ...100
Accuracy:	nD: 0.0002 (corresponds to 0.1°Brix, typically 0.1 M%)
Temperature range:	-20 °C ... +150 °C
Pressure range:	PN10, PN 16, upon request PN 40 (dependent of the process connection)
Materials **wetted sensor:** **Enclosure:** **Process connection:**	 Stainless Steel 316L (1.4404), Optic: Sapphire Stainless Steel 304 (1.4301) Varivent or Tri-clamp compatible process connections
Degree of protection:	Sensor: IP67, ATEX (IECEx) Zone 0/1, 1, 2; C.R.N. registered 0F19201.5 Transmitter: PIOX® R704: IP65, ATEX (IECEx) Zone 2 PIOX® R705: IP66, 316L housing, ATEX (IECEx) Zone 2 PIOX® R709: IP20, 19 inch rack version

Model MH, Varivent-Flange N	**Model MH, Tri-clamp-Flange 3“**
	

PIOX® R400 Chemical design	The chemical design of the PIOX® R400 is the ideal process refractometer for applications in the chemical industry. Due to the special seal design and the fact that the measuring head is separated from the transducer equipment, the PIOX® R ensures maximum process reliability even in the presence of corrosive and toxic media.
Measurement range:	nD: 1.3 ... 1.7, °Brix: 0 ... 100
Accuracy:	nD: 0.0002 (typically 0.1 M%)
Temperature range:	-20 °C ... (+130 °C) +150 °C
Pressure range:	PN10, PN 16, upon request PN 40 (dependent on the process connection)
Materials **wetted sensor:** **Enclosure:** **Process connection:**	 Stainless Steel Version: 316Ti (1.4571), Optic: Sapphire PTFE Version: Completely carbon fibre reinforced PTFE, Optic: Sapphire Stainless Steel Version: 304 (1.4301) PTFE Version: PTFE powder coated Stainless Steel 304 (1.4301) DIN/ANSI compatible flange, FLEXIM flow chamber, Richter gauge-glass
Degree of protection:	Sensor: IP67, ATEX (IECEx) Zone 0/1, 1, 2; C.R.N. registered 0F19201.5 Transmitter: PIOX® R704: IP65, ATEX / IECEx Zone 2 PIOX® R705: IP66, 316L housing, ATEX (IECEx) Zone 2 PIOX® R709: IP20, 19 inch rack version

Model MC, FLEXIM-Flange	**Model LC, DIN- / ANSI-Flange**
	

FLEXIM

In partnership

For over two decades, FLEXIM has been leading the way nationally and internationally for process instrumentation in many areas of industry. As a technology leader and pioneer in the field of non-intrusive clamp-on ultrasonic flow measurement of liquids and gases, FLEXIM has repeatedly set standards. In addition to non-intrusive flow measurement, innovative process analytical methods using ultrasound or refractometry are another focal point of our program.

Permanently forward-looking

We're not resting on our laurels. Every year, we invest generously in research and development to further strengthen our position as a technological leader.
In addition to that, we maintain close contact with our customers. Innovative and reliable products that meet the requirements of end users are the result.

FLEXIM Measurement Services provides you with answers

In today's energy efficient and environmentally conscious environment, facility and plant metering must be verified and calibrated for accuracy to meet audit and regulatory demands. This is especially true for energy intensive industries such as Power Generation, Oil & Gas, Chemical and Processing industries.

We confirm and verify flow rates of existing volume and mass flow meters at your industry specific application.

We also offer complete thermal energy measurements that can help you to evaluate the performance of your plant and processes.

We provide formal reports and in-depth data by employing our traceable calibrated portable meters along with sophisticated diagnostic software.

Our products are hazardous area approved (ATEX (IECEx) Zone 2 (1) and FM Class I, Div. 2) and provide measurements in even the most demanding environments, e.g. Offshore Platforms, or Refineries at pipe temperatures up to +600 °C and beyond.

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