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

Non-intrusive flow measurement with clamp-on ultrasonic technology 4

### Transmitters
- Portable flowmeters – for non-explosive areas 6
- Portable flowmeters – for potentially explosive areas 8
- Stationary measuring transmitters - for non-explosive areas 10
- Stationary measuring transmitters - for potentially explosive areas 12

### Transducers
- For liquid flow measurement 14
- For gas flow measurement 15
- Portable and permanent transducer mounting fixtures 16

### Real-time process analytics
- PIOX® S ultrasonic process analyser 20
- PIOX® R inline process refractometer 22
Measurement technology made in Berlin – used worldwide

FLEXIM develops, manufactures, and sells advanced process measuring devices for industrial applications. For more than 25 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.
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.
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.
FLUXUS® F401 (Water) 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.

- **Measurement uncertainty (volumetric flow rate):** ±2 % of reading ±0.01 m/s
- **Transmitter:**
- **Explosion protection:** –
- **Power supply:** Power supply unit 100 ... 230 V AC / 50 ... 60 Hz, 12 V DC [socket at transmitter] integrated battery Li-Ion, > 25 h operating time
- **Outputs:** 4 - 20 mA passive, pulse / frequency / binary
- **Inputs:** –
- **Digital communication:** –
- **Available transducers:**
- **Pipe size range (inner diameter):** 40 mm ... 4700 mm
- **Temperature range (pipe wall):** -40 °C ... +100 °C

FLUXUS® F601 (Liquids) The portable FLUXUS® F601 Energy is the ideal metering solution for flexible operation during temporary control and service tasks on all liquid filled pipes independent of the flowing medium.

- **Measurement uncertainty (volumetric flow rate):** ±1 % of reading ±0.005 m/s
- **Transmitter:**
- **Explosion protection:** –
- **Power supply:** Power supply unit 100 ... 230 V AC / 50 ... 60 Hz, 12 V DC [socket at transmitter] integrated battery Li-Ion, > 25 h operating time
- **Outputs:** 4 - 20 mA passive, pulse / frequency / binary
- **Inputs:** –
- **Digital communication:** Modbus RTU
- **Available transducers:**
- **Pipe size range (inner diameter):** 6 mm ... 6500 mm
- **Temperature range (pipe wall):** -40 °C ... +200 °C / WI: -200 °C ... + 600 °C

FLUXUS® F601 Energy (Liquids & Thermal Energy) The portable FLUXUS® F601 Energy is the ideal solution for flexible operation during thermal energy as well as liquid flow metering and associated service tasks.

- **Measurement uncertainty (volumetric flow rate):** ±1 % of reading ±0.005 m/s
- **Transmitter:**
- **Explosion protection:** –
- **Power supply:** Power supply unit 100 ... 230 V AC / 50 ... 60 Hz, 12 V DC [socket at transmitter] integrated battery Li-Ion, > 25 h operating time
- **Outputs:** 4 - 20 mA active / passive, pulse / frequency / binary
- **Inputs:** Pt100 / Pt1000, 4 - 20 mA passive
- **Digital communication:** Modbus RTU
- **Available transducers:**
- **Pipe size range (inner diameter):** 6 mm ... 6500 mm
- **Temperature range (pipe wall):** -40 °C ... +200 °C / WI: -200 °C ... + 600 °C
### FLUXUS® G601 (Gases & Liquids)

The portable FLUXUS® G601 is the ideal metering solution for flexible operation during temporary control and service tasks on gas filled pipes. It also allows the measurement at liquid filled pipes.

<table>
<thead>
<tr>
<th>Measurement uncertainty (volumetric flow rate):</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquids</td>
<td>± 1% of reading ± 0.005 m/s</td>
</tr>
<tr>
<td>Gases</td>
<td>±1...3 % of reading ±0.005 m/s, depending on application</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transmitter:</th>
<th>Standard</th>
<th>Multifunctional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explosion protection:</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Power supply:</td>
<td>Power supply unit 100 ... 230 V AC / 50 ... 60 Hz, 12 V DC [socket at transmitter] integrated battery Li-Ion, &gt; 25 h operating time</td>
<td></td>
</tr>
<tr>
<td>Outputs:</td>
<td>4 - 20 mA active / passive, pulse / frequency / binary</td>
<td></td>
</tr>
<tr>
<td>Inputs:</td>
<td>–</td>
<td>Pt100 / Pt1000, 4 - 20 mA passive</td>
</tr>
<tr>
<td>Digital communication:</td>
<td>Modbus RTU</td>
<td></td>
</tr>
<tr>
<td>Available transducers:</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Pipe size range (inner diameter):</td>
<td>Liquids 6 mm ... 6500 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gases 7 mm ... 1600 mm</td>
<td></td>
</tr>
<tr>
<td>Temperature range (pipe wall):</td>
<td>Liquids -40 °C ... +200 °C / WI: -200 °C ... + 600 °C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gases -40 °C ... +200 °C</td>
<td></td>
</tr>
</tbody>
</table>

### FLUXUS® G601 CA Energy (Gases, Compressed Air, Liquids & Thermal 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.

<table>
<thead>
<tr>
<th>Measurement uncertainty (volumetric flow rate):</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquids</td>
<td>± 1% of reading ± 0.005 m/s</td>
</tr>
<tr>
<td>Gases</td>
<td>±1...3 % of reading ±0.005 m/s, depending on application</td>
</tr>
</tbody>
</table>

| Transmitter:  | –                  |
| Explosion protection: | –                  |
| Power supply: | Power supply unit 100 ... 230 V AC / 50 ... 60 Hz, 12 V DC [socket at transmitter] integrated battery Li-Ion, > 25 h operating time |
| Outputs:      | 4 - 20 mA active / passive, pulse / frequency / binary |
| Inputs:       | Pt100 / Pt1000, 4 - 20 mA passive |
| Digital communication: | Modbus RTU |
| Available transducers: | –                  | –               |
| Pipe size range (inner diameter): | Liquids 6 mm ... 6500 mm |
|            | Gases 7 mm ... 1600 mm |
| Temperature range (pipe wall): | Liquids -40 °C ... +200 °C / WI: -200 °C ... + 600 °C |
|            | Gases -40 °C ... +200 °C |
**FLUXUS® F608**

**[Liquids]**

- **Measurement uncertainty (volumetric flow rate):** ±1 % of reading ±0.005 m/s
- **Transmitter:**
- **Explosion protection:** ATEX/IECEx zone 2, FM Class I, Div. 2
- **Power supply:** Power supply unit 100 ... 230 V AC / 50 ... 60 Hz, only for use in non-ex areas 12 V DC (socket at transmitter) integrated battery Li-Ion, > 25 h operating time
- **Outputs:** 4 - 20 mA active / passive, pulse / frequency / binary
- **Inputs:** –
- **Digital communication:** –
- **Available transducers:** –
- **Pipe size range (inner diameter):** 6 mm ... 6500 mm
- **Temperature range (pipe wall):** -40 °C ... +200 °C / WI: -200 °C ... + 600 °C

**FLUXUS® F608 Energy**

**[Liquids & Thermal Energy]**

- **Measurement uncertainty (volumetric flow rate):** ±1 % of reading ±0.005 m/s
- **Transmitter:**
- **Explosion protection:** ATEX/IECEx zone 2, FM Class I, Div. 2
- **Power supply:** Power supply unit 100 ... 230 V AC / 50 ... 60 Hz, only for use in non-ex areas 12 V DC (socket at transmitter) integrated battery Li-Ion, > 25 h operating time
- **Outputs:** 4 - 20 mA active / passive, pulse / frequency / binary
- **Inputs:** Pt100 / Pt1000
- **Digital communication:** –
- **Available transducers:** –
- **Pipe size range (inner diameter):** 6 mm ... 6500 mm
- **Temperature range (pipe wall):** -40 °C ... +200 °C / WI: -200 °C ... + 600 °C
FLUXUS® G608
(Gases & Liquids)

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. It also allows the measurement at liquid filled pipes.

**Measurement uncertainty (volumetric flow rate):**

<table>
<thead>
<tr>
<th></th>
<th>Liquids</th>
<th>Gases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>± 1% of reading ± 0.005 m/s</td>
<td>±1...3 % of reading ±0.005 m/s, depending on application</td>
</tr>
</tbody>
</table>

**Transmitter:**

**Explosion protection:** ATEX/IECEx zone 2, FM Class I, Div. 2

**Power supply:** Power supply unit 100 ... 230 V AC / 50 ... 60 Hz, only for use in non-ex areas 12 V DC [socket at transmitter] integrated battery Li-Ion, > 25 h operating time

**Outputs:**

4 - 20 mA active / passive, pulse / frequency / binary [only available for ATEX/IECEx Zone 2 approved version]

--

FLUXUS® G608
CA Energy
(Gases, Compressed Air, Liquids & Thermal 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.

**Measurement uncertainty (volumetric flow rate):**

<table>
<thead>
<tr>
<th></th>
<th>Liquids</th>
<th>Gases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>± 1% of reading ± 0.005 m/s</td>
<td>±1...3 % of reading ±0.005 m/s, depending on application</td>
</tr>
</tbody>
</table>

**Transmitter:**

**Explosion protection:** ATEX/IECEx zone 1 / zone 2, FM Class I, Div. 2

**Power supply:** Power supply unit 100 ... 230 V AC / 50 ... 60 Hz, only for use in non-ex areas 12 V DC [socket at transmitter] integrated battery Li-Ion, > 25 h operating time

**Outputs:**

4 - 20 mA active / passive, pulse / frequency / binary

Inputs: Pt100 / Pt1000

Available transducers:

--

Pipe size range (inner diameter):

<table>
<thead>
<tr>
<th></th>
<th>Liquids</th>
<th>Gases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6 mm ... 6500 mm</td>
<td>7 mm ... 1600 mm</td>
</tr>
</tbody>
</table>

Temperature range (pipe wall):

<table>
<thead>
<tr>
<th></th>
<th>Liquids</th>
<th>Gases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-40 °C ... +200 °C / WI: -200 °C ... + 600 °C</td>
<td>-40 °C ... +200 °C</td>
</tr>
</tbody>
</table>

**FLUXUS® G608 CA Energy**

(Gases, Compressed Air, Liquids & Thermal 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.

**Measurement uncertainty (volumetric flow rate):**

<table>
<thead>
<tr>
<th></th>
<th>Liquids</th>
<th>Gases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>± 1% of reading ± 0.005 m/s</td>
<td>±1...3 % of reading ±0.005 m/s, depending on application</td>
</tr>
</tbody>
</table>

**Transmitter:**

**Explosion protection:** ATEX/IECEx zone 1 / zone 2, FM Class I, Div. 2

**Power supply:** Power supply unit 100 ... 230 V AC / 50 ... 60 Hz, only for use in non-ex areas 12 V DC [socket at transmitter] integrated battery Li-Ion, > 25 h operating time

**Outputs:**

4 - 20 mA active / passive, pulse / frequency / binary

Inputs: Pt100 / Pt1000

Available transducers:

--

Pipe size range (inner diameter):

<table>
<thead>
<tr>
<th></th>
<th>Liquids</th>
<th>Gases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6 mm ... 6500 mm</td>
<td>7 mm ... 1600 mm</td>
</tr>
</tbody>
</table>

Temperature range (pipe wall):

<table>
<thead>
<tr>
<th></th>
<th>Liquids</th>
<th>Gases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-40 °C ... +200 °C / WI: -200 °C ... + 600 °C</td>
<td>-40 °C ... +200 °C</td>
</tr>
</tbody>
</table>
Stationary Transmitters

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

**SIL2 approved products are available**

### FLUXUS® F50X

**Water & Thermal Energy**

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 / glycol applications, in connection with IP68 rated transducers allowing for measurements at buried water supply lines.

#### Measurement uncertainty (volumetric flow rate):

<table>
<thead>
<tr>
<th>Transmitter</th>
<th>F501</th>
<th>F502 TE – Thermal Energy (Water only)</th>
<th>F501 Semiconductor for liquids in tubes</th>
</tr>
</thead>
<tbody>
<tr>
<td>± 1.5% of reading ± 0.01 m/s</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Explosion protection:

- 

#### Power supply:

100 ... 230 V AC / 50 ... 60 Hz, 12 / 24 V DC

#### Outputs:

4 - 20 mA active, pulse / binary

#### Inputs:

- Pt100 / Pt1000

#### Digital communication:

Modbus RTU, BACnet, MS/TP, M-Bus

#### Available transducers:

- 

#### Pipe size range (inner diameter):

10 mm ... 2400 mm

#### Temperature range (pipe wall):

-40 °C ... +100 °C

### FLUXUS® F706

**Liquids**

The non-invasive FLUXUS® F706 ultrasonic liquid flow meter is setting standards in terms of measurement performance. In conjunction with the F704 TE for thermal energy metering, they are the state-of-the-art meters in terms of accuracy and reliability.

#### Measurement uncertainty (volumetric flow rate):

± 1% of reading ± 0.005 m/s

#### Transmitter:

F721

#### Power supply:

100 ... 230 V AC / 50 ... 60 Hz, 12 / 24 V DC

#### Outputs:

4 - 20 mA active / passive, pulse / frequency / binary

#### Inputs:

Pt100 / Pt1000, 4 - 20 mA active / passive, binary

#### Digital communication:

Modbus RTU/TCP, BACnet MSTP/IP, M-Bus, Profibus PA, Foundation Fieldbus

#### Available transducers:

- 

#### Pipe size range (inner diameter):

6 mm ... 6500 mm

#### Temperature range (pipe wall):

-40 °C ... +240 °C / Wi: -200 °C ... +600 °C

### FLUXUS® F704 TE

**Liquids & Thermal Energy**

The non-invasive FLUXUS® F704 TE ultrasonic liquid & thermal energy flow meter is setting standards in terms of measurement performance. In conjunction with the F706 for liquid applications, they are the state-of-the-art meters in terms of accuracy and reliability.

#### Measurement uncertainty (volumetric flow rate):

± 1% of reading ± 0.005 m/s

#### Transmitter:

F721

#### Power supply:

100 ... 230 V AC / 50 ... 60 Hz, 12 / 24 V DC

#### Outputs:

4 - 20 mA active / passive, pulse / frequency / binary

#### Inputs:

Pt100 / Pt1000, 4 - 20 mA active / passive, binary

#### Digital communication:

Modbus RTU, HART, BACnet MS/TP, M-Bus

#### Available transducers:

- 

#### Pipe size range (inner diameter):

6 mm ... 6500 mm

#### Temperature range (pipe wall):

-40 °C ... +240 °C / Wi: -200 °C ... +600 °C

### FLUXUS® F721

**Liquids**

The non-invasive FLUXUS® F721 ultrasonic liquid flow meter is setting standards in terms of measurement performance. In conjunction with the F704 TE for thermal energy metering, they are the state-of-the-art meters in terms of accuracy and reliability.

#### Measurement uncertainty (volumetric flow rate):

± 1% of reading ± 0.005 m/s

#### Transmitter:

F721

#### Power supply:

100 ... 230 V AC / 50 ... 60 Hz, 12 / 24 V DC

#### Outputs:

4 - 20 mA active / passive, pulse / frequency / binary

#### Inputs:

Pt100 / Pt1000, 4 - 20 mA active / passive, binary

#### Digital communication:

Modbus RTU/TCP, BACnet MSTP/IP, M-Bus, Profibus PA, Foundation Fieldbus

#### Available transducers:

- 

#### Pipe size range (inner diameter):

6 mm ... 6500 mm

#### Temperature range (pipe wall):

-40 °C ... +240 °C / Wi: -200 °C ... +600 °C
### Stationary Transmitters

**Water (WD) and Gases (G & CA)**

Non-ex and ATEX (IECEx) Zone 2, FM Class I, Div. 2 certified

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FLUXUS® F721WD</strong> (Water)</td>
<td>The FLUXUS® F721WD is the ideal flow metering solution for water suppliers. They are IP68 rated to work even in poor conditions.</td>
<td>Measurement uncertainty (volumetric flow rate): ± 1% of reading ± 0.005 m/s.</td>
</tr>
<tr>
<td></td>
<td>Transmitter: 4 - 20 mA active/passive, 4 - 20 mA HART active/passive, pulse/frequency/binary.</td>
<td>Outputs: 4 - 20 mA active/passive, 4 - 20 mA HART active/passive, pulse/frequency/binary.</td>
</tr>
<tr>
<td></td>
<td>Explosion protection: ATEX/IECEx Zone 2, FM Class I, Div. 2.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Power supply: 100 ... 230 V AC / 50 ... 60 Hz, 12 / 24 V DC.</td>
<td></td>
</tr>
<tr>
<td><strong>FLUXUS® G721</strong> (Gases)</td>
<td>The non-invasive FLUXUS® G721 ultrasonic flow meter is designed for highest precision under all circumstances.</td>
<td>Measurement uncertainty (volumetric flow rate): ±1...3 % of reading ±0.005 m/s, depending on application.</td>
</tr>
<tr>
<td><strong>FLUXUS® G704CA</strong> (Compressed Air)</td>
<td>The non-invasive FLUXUS® G704CA ultrasonic gas flow meter is designed for compressed air and industrial gases.</td>
<td></td>
</tr>
<tr>
<td><strong>FLUXUS® G706</strong> (Gases)</td>
<td>The non-invasive 4-Channel ultrasonic gas flow meter FLUXUS® G706 offers highest precision and is used for control and redundancy measurements.</td>
<td></td>
</tr>
</tbody>
</table>

**Inputs:**

- 4 - 20 mA active/passive, 4 - 20 mA HART active/passive, pulse/frequency/binary.
- Pt100 / Pt1000.
- Modbus RTU/TCP, BACnet MSTP/IP, M-Bus, Profibus PA, Foundation Fieldbus.

**Available transducers:**

- ATEX/IECEx Zone 1 / Zone 2, FM Class I / Div 2.
- Pipe size range (inner diameter): 7 mm ... 1600 mm.
- Temperature range (pipe wall): -40 °C ... +240 °C.
FLUXUS® F809
(Liquids)  The FLUXUS® F809 is an ATEX (IECEx) zone 1 and FM Class I, div. 1 approved dual channel liquid flow meter for any industrial environment. It can even be employed at extreme temperatures ranging from -190 °C up to +600 °C.

| Measurement uncertainty (volumetric flow rate): | ± 1% of reading ± 0.005 m/s |
| Transmitter: | ATEX/IECEx zone 1, FM Class I / Div 1 |
| Power supply: | 100 ... 230 V AC / 50 ... 60 Hz, 24 V DC |
| Outputs: | 4-20 mA active / passive, 4-20 mA HART active / passive, 4 - 20 mA HART passive intrinsic safety, pulse / frequency / binary |
| Inputs: | – |
| Digital communication: | Modbus RTU |

Available transducers:

Explosion protection: ATEX/IECEx zone 1 / FM Class I / Div 1
Pipe size range (inner diameter): 6 mm ... 6500 mm
Temperature range (pipe wall): -40 °C ... +240 °C / WI: -200 °C ... +600 °C

FLUXUS® F801
(Liquids)  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).

| Measurement uncertainty (volumetric flow rate): | ± 1% of reading ± 0.005 m/s |
| Transmitter: | ATEX/IECEx zone 1 |
| Power supply: | 100 ... 230 V AC / 50 ... 60 Hz, 24 V DC |
| Outputs: | 4-20 mA active / passive, 4-20 mA HART active / passive, 4 - 20 mA passive intrinsic safety, pulse / frequency / binary |
| Inputs: | – |
| Digital communication: | Modbus RTU |

Available transducers:

Explosion protection: ATEX/IECEx zone 1
Pipe size range (inner diameter): 6 mm ... 6500 mm
Temperature range (pipe wall): -40 °C ... +240 °C / WI: -200 °C ... +600 °C

FLUXUS® F808
(Liquids)
FLUXUS® F808LF
(Liquids, low flow product variant)  The FLUXUS® F808 is an ATEX (IECEx) zone 1 and FM Class I, div. 1 approved single channel liquid flow meter. As special product variant „FLUXUS® F808LF“, it is engineered to measure extremely low flows.

| Product variant: | FLUXUS® F808 | FLUXUS® F808LF |
| Measurement uncertainty (volumetric flow rate): | ± 1% of reading ± 0.005 m/s | ± 1,2 % of reading ± 0,08/(N*ID) with N = number of sound paths (e.g. ± 1,2 % of reading ± 0,001 m/s with ID = 10 mm, N = 8) |
| Transmitter: | ATEX/IECEx zone 1 |
| Power supply: | 100 ... 230 V AC / 50 ... 60 Hz, 24 V DC |
| Outputs: | 4-20 mA active / passive, 4-20 mA HART active / passive, pulse / frequency / binary |
| Inputs: | – |
| Digital communication: | Modbus RTU |

Available transducers:

Explosion protection: ATEX/IECEx zone 1
Pipe size range (inner diameter): 6 mm ... 6500 mm
Temperature range (pipe wall): -40 °C ... +240 °C / WI: -200 °C ... +600 °C
### Stationary Transmitters

**FLUXUS® G809 (Gases)**

The FLUXUS® G809 is an ATEX (IECEx) zone 1 and FM Class I, div. 1 approved dual channel gas flow meter for any industrial environment. It accurately and reliably measures any gaseous medium.

**Measurement uncertainty [volumetric flow rate]:**

±1...3 % of reading ±0.005 m/s, depending on application

**Transmitter:**

**Explosion protection:** ATEX/IECEx zone 1, FM Class I /Div 1

**Power supply:** 100 ... 230 V AC / 50 ... 60 Hz, 24 V DC

**Outputs:**

- 4 - 20 mA active / passive
- 4 - 20 mA HART active / passive
- 4 - 20 mA HART passive intrinsic safety
- pulse / frequency / binary

**Inputs:**

- Digital communication: Modbus RTU

**Available transducers:**

**Explosion protection:** ATEX/IECEx zone 1 / FM Class I / Div 1

**Pipe size range (inner diameter):** 7 mm ... 1600 mm

**Temperature range (pipe wall):** -40 °C ... +240 °C

---

### FLUXUS® G801 (Gases)

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).

**Measurement uncertainty [volumetric flow rate]:**

±1...3 % of reading ±0.005 m/s, depending on application

**Transmitter:**

**Explosion protection:** ATEX/IECEx zone 1

**Power supply:** 100 ... 230 V AC / 50 ... 60 Hz, 24 V DC

**Outputs:**

- 4 - 20 mA active / passive
- 4 - 20 mA HART active / passive
- 4 - 20 mA passive intrinsic safety
- pulse / frequency / binary

**Inputs:**

- Digital communication: Modbus RTU

**Available transducers:**

**Explosion protection:** ATEX/IECEx zone 1

**Pipe size range (inner diameter):** 7 mm ... 1600 mm

**Temperature range (pipe wall):** -40 °C ... +240 °C
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**

<table>
<thead>
<tr>
<th>Type</th>
<th>FSS</th>
<th>FSQ (also available as metal-free product variant)</th>
<th>FSP / FSM</th>
<th>FSK</th>
<th>FSG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Techn. drawing:</td>
<td><img src="image1" alt="FSS" /></td>
<td><img src="image2" alt="FSQ" /></td>
<td><img src="image3" alt="FSP_FSM" /></td>
<td><img src="image4" alt="FSK" /></td>
<td><img src="image5" alt="FSG" /></td>
</tr>
<tr>
<td>Dimensions of standard transducers in mm (l x w x h):</td>
<td>25 x 13 x 17</td>
<td>39 x 22 x 25.5</td>
<td>62.5 x 32 x 40.5</td>
<td>126.5 x 51 x 67.5</td>
<td>129.5 x 51 x 67</td>
</tr>
<tr>
<td>Operating temp. (ext. temp. area):</td>
<td>-30 °C ... +130 °C</td>
<td>-40 °C ... +130 °C (-30 °C ... +200 °C)</td>
<td>-40 °C ... +130 °C (-30 °C ... +200 °C)</td>
<td>-40 °C ... +130 °C</td>
<td>-40 °C ... +130 °C</td>
</tr>
<tr>
<td>Protection degree:</td>
<td>IP65</td>
<td>IP65, IP67 optional</td>
<td>IP65, IP68 optional</td>
<td>IP65, IP68 optional</td>
<td>IP65, IP68 optional</td>
</tr>
<tr>
<td>Hazardous area approval:</td>
<td>FM Class I, Div. 2</td>
<td>ATEX (IECEX) Zone 1 and 2 FM Class I, Div. 1/2</td>
<td>ATEX (IECEX) Zone 1 and 2 FM Class I, Div. 1/2</td>
<td>ATEX (IECEX) Zone 1 and 2 FM Class I, Div. 1/2</td>
<td>ATEX (IECEX) Zone 1 and 2 FM Class I, Div. 1/2</td>
</tr>
</tbody>
</table>

**Clamp-On Ultrasonic Transducers**

For the flow measurement of liquids

<table>
<thead>
<tr>
<th>Inner pipe diameter in mm (no limitations by pipe wall thickness or pipe wall material)</th>
<th>5</th>
<th>10</th>
<th>50</th>
<th>100</th>
<th>500</th>
<th>1000</th>
<th>5000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inner pipe diameter in mm (no limitations by pipe wall thickness or pipe wall material)</td>
<td>5</td>
<td>10</td>
<td>50</td>
<td>100</td>
<td>500</td>
<td>1000</td>
<td>5000</td>
</tr>
</tbody>
</table>
Lamb wave Transducers

<table>
<thead>
<tr>
<th>Typ</th>
<th>Inner pipe diameter in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLF</td>
<td>5 - 10</td>
</tr>
<tr>
<td>GLG</td>
<td>10 - 50</td>
</tr>
<tr>
<td>GLH</td>
<td>50 - 100</td>
</tr>
<tr>
<td>GLK</td>
<td>100 - 500</td>
</tr>
<tr>
<td>GLM</td>
<td>500 - 2000</td>
</tr>
<tr>
<td>GLP</td>
<td>2000</td>
</tr>
<tr>
<td>GLQ</td>
<td>up to 35 mm</td>
</tr>
</tbody>
</table>

Shear wave Transducers*

<table>
<thead>
<tr>
<th>Typ</th>
<th>Inner pipe diameter in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSG</td>
<td>&gt; 0.4 mm Pipe wall thickness</td>
</tr>
<tr>
<td>GSK</td>
<td>&gt; 1 mm Pipe wall thickness</td>
</tr>
<tr>
<td>GSM</td>
<td>&gt; 2 mm Pipe wall thickness</td>
</tr>
<tr>
<td>GSP</td>
<td>&gt; 5 mm Pipe wall thickness</td>
</tr>
<tr>
<td>GSQ</td>
<td>&gt; 11 mm Pipe wall thickness</td>
</tr>
</tbody>
</table>

For the flow measurement of gases

**Lamb wave trans.**

- GLQ

**Shear wave transd.* for gases:**

- GLP / GLM
- GSP / GSM
- GLH / GLK
- GSK
- GLM

Techn. drawing:

Dimensions of standard transducers in mm (l x w x h):

- GLQ: 42 x 22 x 25.5
- GLP / GLM: 74 x 32 x 40.5
- GLH / GLK: 128.5 x 51 x 67.5
- GSK: 128.5 x 51 x 67.5
- GLM: 163 x 54 x 91.3

Operating temp.:

- GLQ: -40 °C ... +170 °C
- GLP / GLM: -40 °C ... +170 °C
- GLH / GLK: -40 °C ... +170 °C
- GSK: -40 °C ... +170 °C
- GLM: -40 °C ... +170 °C

Protection degree:

- GLQ: IP65, IP68 optional
- GLP / GLM: IP65, IP68 optional
- GLH / GLK: IP65, IP68 optional
- GSK: IP65, IP68 optional
- GLM: IP65

Hazardous area approval:

- GLQ: ATEX (IECEEx) Zone 1 and 2 FM Class I, Div. 1 / 2
- GLP / GLM: ATEX (IECEEx) Zone 1 and 2 FM Class I, Div. 1 / 2
- GLH / GLK: ATEX (IECEEx) Zone 1 and 2 FM Class I, Div. 1 / 2
- GSK: ATEX (IECEEx) Zone 1 and 2 FM Class I, Div. 1 / 2
- GLM: ATEX (IECEEx) 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

<table>
<thead>
<tr>
<th>Portable Mounting Fixtures:</th>
<th>Portable VarioFix (Chains / Magnets)</th>
<th>Fastening Shoes (FS) (Chains / Magnets)</th>
<th>Tension Belts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>The portable VarioFix is the standard mounting fixture for temporary measurements with M and K transducers.</td>
<td>The fastening shoes [FS] are used for temporary measurements with S, Q and M transducers.</td>
<td>The tension belts are used for temporary measurements with K and larger transducers at big pipe sizes.</td>
</tr>
<tr>
<td>Techn. drawing:</td>
<td><img src="image1" alt="Techn. drawing" /></td>
<td><img src="image2" alt="Techn. drawing" /></td>
<td><img src="image3" alt="Techn. drawing" /></td>
</tr>
<tr>
<td>Material:</td>
<td>Stainless Steel: 304 (1.4301), 301 (1.4310), 303 (1.4305)</td>
<td>Stainless Steel: 304 (1.4301), 301 (1.4310), 303 (1.4305)</td>
<td>Steel, powder coated and textile tension belt</td>
</tr>
<tr>
<td>Dimensions in mm (l x b x h):</td>
<td>414 x 94 x 76 (40)</td>
<td>210 x 32 x 44 for 5 transducers 420 x 48 x 58 for Q and M transducers</td>
<td>-</td>
</tr>
</tbody>
</table>
Transducer Mounting Fixtures

For permanent measurements

<table>
<thead>
<tr>
<th>Mounting Fixture</th>
<th>VARIOFIX L</th>
<th>VARIOFIX C</th>
<th>Block fastener</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>The VARIOFIX L is FLEXIM’s standard transducer mounting fixture and provides highest mechanical protection within all industrial environments.</td>
<td>The VARIOFIX C is FLEXIM’s mounting fixture for especially harsh and corrosive environments, e.g. offshore.</td>
<td>The block mounting fixture is completely metal free and designed for applications at flexible tubings, e.g. to be used in clean room environments.</td>
</tr>
<tr>
<td>Techn. drawing:</td>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td>Dimensions in mm (l x b x h):</td>
<td>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</td>
<td>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 VQ: 310 x 85 x 62</td>
<td>For outer pipe diameters: 3/8”, 1/2”, 3/4”, 1”, 1 1/4” (others on request)</td>
</tr>
</tbody>
</table>

Mounting Fixture PermaFix WavelInjector® WavelInjector® Cryo

| Description:     | The PermaFix fixture is designed for mounting of FM Class I, Div. 1 transducers and associated conduits. | The WavelInjector® is FLEXIM’s mounting fixture for extreme pipe wall temperatures for as low as -190 °C up to +600 °C. | The WavelInjector® Cryo (FLUXUS Cryo) is FLEXIM’s mounting fixture for pipe temperatures below 40 °C down to -190 °C |
| Techn. Drawing:  | ![Image](image4.png) | ![Image](image5.png) | ![Image](image6.png) |
| 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 + l0 (l = 273 mm) w = outer pipe diameter + 32 mm h = outer pipe diameter + 570 mm |
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
Mass flow, density and concentration measurement without media contact

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 PIOX® ID

#### Mass flow, density and concentration measurement - PIOX® S

PIOX® S can be used to determine the mass flow rate, density and concentration of many chemical media in real-time by determination of the acoustic velocity and internal offsetting of the medium temperature. The product variant PIOX® S721 – SA is a derivative of PIOX® S and engineered for concentration, density and mass flow measurement of Sulphuric Acid at 80 to 100% conc.

**Measurement uncertainty (volumetric flow rate):** ± 1% of reading ± 0.005 m/s

<table>
<thead>
<tr>
<th>Transmitter:</th>
<th>PIOX® S721</th>
<th>PIOX® S721 SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explosion protection:</td>
<td>ATEX/IECEx Zone 2, FM Class I / Div 2</td>
<td>–</td>
</tr>
<tr>
<td>Power supply:</td>
<td>100 ... 230 V AC / 50 ... 60 Hz, 12 / 24 V DC</td>
<td>–</td>
</tr>
<tr>
<td>Outputs:</td>
<td>4 - 20 mA active / passive, pulse / frequency / binary</td>
<td>–</td>
</tr>
<tr>
<td>Inputs:</td>
<td>Pt100 / Pt1000, 4 - 20 mA active / passive, binary</td>
<td>–</td>
</tr>
<tr>
<td>Digital communication:</td>
<td>Modbus RTU/TCP, BACnet MSTP/IP, Profinet PA, Foundation Fieldbus</td>
<td>–</td>
</tr>
</tbody>
</table>

#### PIOX® S721 / PIOX® S721 SA

Explosion protection: ATEX/IECEx Zone 2, FM Class I / Div 2

Power supply: 100 ... 230 V AC / 50 ... 60 Hz, 12 / 24 V DC

Outputs: 4 - 20 mA active / passive, pulse / frequency / binary

Inputs: Pt100 / Pt1000, 4 - 20 mA active / passive, binary

Digital communication: Modbus RTU/TCP, BACnet MSTP/IP, Profinet PA, Foundation Fieldbus

#### PIOX® S502 ID

PIOX® ID is a stationary ultrasonic measurement system for the non-invasive distinction of 2 fluids (standard version) or of one fluid from 5 fluids (extended version) during tank filling or transfer. On the basis of reliable fluid distinction by means of the PIOX® ID, misfuelling and thereby a hazardous mix-up of fluids can be prevented.

**Media Pairs:** NaClO/HCl, NaClO/HNO₃, NaClO/H₂SO₄, NaOH/HCl, NaOH/HNO₃, NaOH/H₂SO₄, H₂SO₄/HCl (others on request)

With the following concentrations:

- NaClO (Sodium Hypochlorite) 12 ... 16%
- NaOH (Sodium Hydroxide) 30 ... 50%
- H₂SO₄ (Sulphuric Acid) 93 ... 100%
- HCl (Hydrochloric Acid) 15 ... 37%
- HNO₃ (Nitric Acid) 50 ... 65%

**Transmitter:**

Explosion protection: –

Power supply: 100 ... 230 V AC / 50 ... 60 Hz, 24 V DC

Outputs: 4 - 20 mA active [status], binary [status]

Inputs: Pt100 / Pt1000

Digital communication: –

**Available transducers:**

Explosion protection: –

Pipe size range (inner diameter): DN25 ... DN65

Temperature range [pipe wall]: -40 °C ... +100 °C
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® R500-H for applications where hygiene is particularly important, e.g. in the pharmaceutical, food and drinks industries as well as the PIOX® R500-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® R500-H
Process refractometer for hygienic applications

PIOX® R500-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® R500-C
Process refractometer for chemical applications

PIOX® R500-C was developed especially for applications in the chemical industry. The sophisticated design and high-quality materials ensure operational safety even under challenging conditions, e.g. when measuring highly aggressive media as well as in potentially explosive areas.
PIOX® R721/R500
Hygienic design

The hygienic design of the PIOX® R721/R500 is the ideal process refractometer for applications in the pharmaceutical and food & beverages industry. The PIOX® R721/R500 offers maximum process reliability, the highest level of precision and is resistant to deposit formation.

<table>
<thead>
<tr>
<th>Measurement range:</th>
<th>nD: 1.3 ... 1.7, °Brix: 0 ... 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement uncertainty (volumetric flow rate):</td>
<td>nD: 0.0002 [corresponds to 0.1 °Brix, typical 0.1 wt%]</td>
</tr>
</tbody>
</table>

Transmitter (R721):

- Explosion protection: ATEX/IECEx zone 2, FM Class I /Div 2
- Power supply: 100 ... 230 V AC / 50 ... 60 Hz, 20 ... 32 V DC
- Outputs: 4 - 20 mA active / passive, pulse / frequency / binary
- Inputs: Pt100 / Pt1000, 4 - 20 mA active / passive / binary
- Digital communication: Modbus RTU/TCP, BACnet MSTP/IP, Profibus PA, Foundation Fieldbus

PIOX® R721/R500
Chemical design

The chemical design of the PIOX® R721/R500 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® R721/R500 ensures maximum process reliability even in the presence of corrosive and toxic media.

<table>
<thead>
<tr>
<th>Measurement range:</th>
<th>nD: 1.3 ... 1.7, °Brix: 0 ... 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement uncertainty (volumetric flow rate):</td>
<td>nD: 0.0002 [corresponds to 0.1 °Brix, typical 0.1 wt%]</td>
</tr>
</tbody>
</table>

Transmitter (R721):

- Explosion protection: ATEX/IECEx zone 2, FM Class I /Div 2
- Power supply: 100 ... 230 V AC / 50 ... 60 Hz, 20 ... 32 V DC
- Outputs: 4 - 20 mA active / passive, pulse / frequency / binary
- Inputs: Pt100 / Pt1000, 4 - 20 mA active / passive / binary
- Digital communication: Modbus RTU/TCP, BACnet MSTP/IP, Profibus PA, Foundation Fieldbus

Sensor (R500):

- Explosion protection: ATEX (IECEx) zone 0, 1, 2
- Temperature range: -20 °C ... +150 °C
- Pressure range: PN 10
- Process connection: Varivent (N) or Tri-Clamp 3" compatible process connections

PIOX® R721/R500
Chemical design

The chemical design of the PIOX® R721/R500 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® R721/R500 ensures maximum process reliability even in the presence of corrosive and toxic media.

<table>
<thead>
<tr>
<th>Measurement range:</th>
<th>nD: 1.3 ... 1.7, °Brix: 0 ... 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement uncertainty (volumetric flow rate):</td>
<td>nD: 0.0002 [corresponds to 0.1 °Brix, typical 0.1 wt%]</td>
</tr>
</tbody>
</table>

Transmitter (R721):

- Explosion protection: ATEX/IECEx zone 2, FM Class I /Div 2
- Power supply: 100 ... 230 V AC / 50 ... 60 Hz, 20 ... 32 V DC
- Outputs: 4 - 20 mA active / passive, pulse / frequency / binary
- Inputs: Pt100 / Pt1000, 4 - 20 mA active / passive / binary
- Digital communication: Modbus RTU/TCP, BACnet MSTP/IP, Profibus PA, Foundation Fieldbus

Sensor:

- Explosion protection: ATEX (IECEx) zone 0, 1, 2
- Temperature range: -20 °C ... +150 °C
- Pressure range: PN 10, PN 16, PN 40 (on request, depending on process connection)
- Process connection: DIN/ANSI flange, proprietary FLEXIM flow cell, standard sight glass fitting
In partnership

For almost three 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.