Optiflux 1000
Electromagnetic flow sensor in sandwich design

- Lightweight and compact
- Excellent price to performance ratio
- Quick and easy to install
Reliable and cost-effective solution

The flangeless OPTIFLUX 1000 electromagnetic flow sensor is compact and lightweight. The design is robust with the highly chemically resistant PTFE liner.

This device is a cost-effective and reliable solution for a wide range of applications and industries varying from water and wastewater, agriculture, utilities and from fire-fighting to machine building.

Highlights
- Sandwich design
- Compact and ease of installation
- Excellent price to performance ratio
- No moving parts, no maintenance
- Bidirectional flow measurement

Industries and applications
- Machine building - mixing, batching, pump control, dosing and filtration systems
- Energy, HVAC - water flow monitoring
- Water and Waste water - distribution lines and treatment plants
- Effluent treatment plants - measurement of water, chemicals, effluent
- Process industries - measurement of water, chemicals, effluent
- Food and Beverages - measurement of milk, juices, concentrates, water etc.

Measuring Principle – Faraday’s law

An electrically conductive fluid flows inside an electrically insulated pipe through a magnetic field. This magnetic field is generated by a current, flowing through a pair of field coils. Inside the fluid, a voltage $U$ is generated:

$$U = V \cdot K \cdot B \cdot D$$

Where

$V$ = Mean flow velocity

$K$ = Meter constant / correction factor for geometry

$B$ = Magnetic field strength

$D$ = Inner diameter of flowmeter

The signal voltage $U$ is picked up by electrodes and is directly proportional to the mean flow velocity $V$ and thus the flow rate $Q$. The generated signal voltage is very low.

Signal converter is used to amplify this signal voltage, filter it [separate from noise] and convert it into signals for totaling, recording and processing the output.

1. Voltage (induced voltage is directly proportional to flow velocity)
2. Electrodes
3. Magnetic field
4. Field coils
## Technical data

### Measuring system

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring principle</td>
<td>Faraday's law of electromagnetic induction</td>
</tr>
<tr>
<td>Application range</td>
<td>Electrically conductive fluids</td>
</tr>
<tr>
<td>Measured value</td>
<td>Volumetric flow and Velocity</td>
</tr>
</tbody>
</table>

### Design

<table>
<thead>
<tr>
<th>Features</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Features</td>
<td>Sandwich design</td>
</tr>
<tr>
<td>PTFE liner</td>
<td>Other liners available optionally</td>
</tr>
<tr>
<td>Light weight</td>
<td>Compact design</td>
</tr>
<tr>
<td>Modular construction</td>
<td>The measurement system, consisting of a flow sensor and a signal converter, is available in compact or separate version. More information about the signal converter can be found in the technical data sheet of the signal converter.</td>
</tr>
</tbody>
</table>

| Nominal diameter              | 1" .... 6" / DN 25 .... DN 150                                              |
| Measurement range             | -12...12 m/s / -40...40 ft/s                                                |

### Measuring accuracy

<table>
<thead>
<tr>
<th>Measuring error (with signal converter)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFC 050 converter – DN 25 ... DN 150</td>
<td>±0.5% of mv</td>
</tr>
<tr>
<td>IFC 100 converter – DN 25 ... DN 150</td>
<td>±0.5% of mv</td>
</tr>
<tr>
<td>IFC 300 converter – DN 25 ... DN 150</td>
<td>±0.3% of mv + 1mm/s</td>
</tr>
<tr>
<td>Special calibration</td>
<td>Higher accuracy available on request</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±0.1% of mv</td>
</tr>
</tbody>
</table>

### Operating conditions

#### Temperature

| Process temperature             | PTFE: -40...+180°C / -40...+356°F for remote version                      |
|                                | PTFE: -40...+90°C / -46...+194°F for compact version                      |

#### Pressure

| Operating pressure             | Up to 16 Bar / 230 psi                                                   |
|                               | Mating flanges: ANSI 150, ANSI 300, PN40, PN16                           |
| Pressure loss                  | Negligible                                                               |

#### Chemical properties

| Physical condition             | Liquids                                                                   |
|                                | Water ≥ 20 µS/cm                                                          |
|                                | Process fluids ≥ 5 µS/cm                                                  |
| Electrical conductivity        |                                                                          |
| Permissible gas content        | ≤ 5% by volume                                                           |
| Permissible solid content      | ≤ 10% by volume                                                          |

### Installation conditions

| Installation                  | Take care that flow sensor is fully filled                                |
| Flow direction                 | Forward and reverse                                                       |
| Arrow on flow sensor           | Indicates positive flow direction                                         |
| Inlet straight run             | ≥ 5 DN                                                                   |
| Outlet straight run            | ≥ 2 DN                                                                   |
Materials

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring tube</td>
<td>SS 304</td>
</tr>
<tr>
<td>Liner</td>
<td>PTFE for 1” … 6” / DN 25 … DN 150</td>
</tr>
<tr>
<td>Other liners available on request</td>
<td></td>
</tr>
<tr>
<td>Sensor housing</td>
<td>SS316 PU painted</td>
</tr>
<tr>
<td>Process connection</td>
<td>For installation between ANSI 150, ANSI 300, DIN flanges</td>
</tr>
<tr>
<td>Measuring electrodes</td>
<td>Hastelloy C, SS316, SS316L</td>
</tr>
<tr>
<td>Grounding rings</td>
<td>SS 316</td>
</tr>
<tr>
<td>Optional: SS 316L, Hastelloy C</td>
<td></td>
</tr>
<tr>
<td>Connection box (only for remote versions)</td>
<td>Standard: Die-cast Aluminum PU painted</td>
</tr>
<tr>
<td>Optional: Stainless steel</td>
<td></td>
</tr>
<tr>
<td>Cable entry</td>
<td>M 20 x 1.5, fitted with blind plugs</td>
</tr>
</tbody>
</table>

Electrical connections

<table>
<thead>
<tr>
<th>Component</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal Cable</td>
<td>Only for remote versions</td>
</tr>
<tr>
<td>Type DS</td>
<td>Standard cable: Double shielded</td>
</tr>
<tr>
<td></td>
<td>Standard length: 10 m</td>
</tr>
<tr>
<td></td>
<td>Maximum: 150 m / 495ft (depending on electrical conductivity)</td>
</tr>
</tbody>
</table>

Approvals and Certifications

<table>
<thead>
<tr>
<th>Protection category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>according to IEC 529/EN 60529</td>
<td>Standard: IP 66 / 67 (NEMA 4 / 4X)</td>
</tr>
<tr>
<td>Optional: IP 68 / NEMA 6P</td>
<td></td>
</tr>
</tbody>
</table>

Dimensions and weights

<table>
<thead>
<tr>
<th>Meter size: 1” / DN25 and 1 ½” / DN40</th>
<th>Meter size: 2” to 6” / DN50 to DN 150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter size</td>
<td>E</td>
</tr>
<tr>
<td>DN25</td>
<td>115</td>
</tr>
<tr>
<td>DN40</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use 1 ½”, 2” and 2 ½” flanges to install flowmeter size 1”, 1 ½” and 2” respectively.

Note: The subject flow meters cannot be used as a weight or measures under the Legal Metrology Act.
Specifications subject to changes without prior notice.

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