System: SONOCONTROL 15, SONOCONTROL 15 Ex

Function: Non-intrusive full/empty limit switch at pipes with smaller nominal diameters (DN8 ... DN50)
Application examples:
- Low level control in chromatography plant systems (HPLC)
- Protection against dry running for ultrapure / deionized water supply
- Overflow indication at ultrafiltration systems

Measuring principle: Ultrasound through the pipe wall, detected is the complete filling with liquids in the sensor axis; no direct contact between sensor and liquids; no need for constructional changes mounting the sensor at the pipe.

Material of the sensor: Stainless steel 1.4301, PEEK

Mounting: PVDF-clamp, coupling medium

Liquids: Water and watery liquids, liquids of low viscosity; Less suitable for emulsions, dispersions, suspensions, liquids with a lot of bubbles or solids

Material of the pipe: Steel, Stainless steel, plastics, glass, ceramics

Coatings of the pipe: Without coating, galvanized, lacquering, plastic coating, and the like

Teach-in: The sensor takes the characteristics of the pipe in the empty and in the filled condition (in this order), triggered by an operating magnet.

Mounting at the pipe / dimensions: Together with a coupling medium the sensor is mounted laterally at the pipe. The fastening element consists of two parts. Together with the coupling medium, the sensor forms a complex connection around the pipe.

The sensor is available in 4 sizes, which correspond to the different outer pipe diameters. The pipe clamp is delivered in a customized version adapted to the outer pipe diameter (when ordering quote the exact diameter). The given dimension \( L_{\text{max}} \) applies for the corresponding maximum possible pipe diameter.

<table>
<thead>
<tr>
<th>Size</th>
<th>Outer pipe diameter</th>
<th>Dimensions of the PVDF-fastening element ( L_{\text{max}} \times W \times H )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10 mm ... 23 mm</td>
<td>42 x 50 x 40 mm</td>
</tr>
<tr>
<td>2</td>
<td>&gt; 23 mm ... 36 mm</td>
<td>58 x 65 x 40 mm</td>
</tr>
<tr>
<td>3</td>
<td>&gt; 36 mm ... 54 mm</td>
<td>77 x 80 x 40 mm</td>
</tr>
<tr>
<td>4</td>
<td>&gt; 54 mm ... 63,5 mm</td>
<td>82 x 86 x 40 mm</td>
</tr>
</tbody>
</table>

Temperature range:
- Storage temperature: -40 ... 85 °C
- Pipe temperature: -40 ... 140 °C
- Ambient temperature: -40 ... 80 °C

The acceptable pipe temperature and ambient temperature are interdependent.

Time response / switching delay:
- Full \( \rightarrow \) empty: 0,5 s
- Empty \( \rightarrow \) full: 0,5 s
### Connection / power supply

- 4-pole M12 sensor connector (2 contacts connected)
- Direct current 12 - 40 V (non-Ex), 12 - 33 V (Ex)
- Ripple max. 5 % (peak value: min. 12 V, max. 40V (non-Ex), 33 V (Ex))

### Output / switching display

- 2-wire system (4...20 mA concept)
- The switching status is represented by the current consumption of the sensor. There is no additional switching output.
- Current consumption:
  - empty: 8 mA ± 2 %
  - full: 16 mA ± 2 %
  - error: approx. 22 mA
  - failed teach-in: approx. 0.2 mA
- Display: 2 LED (operating state, switching status)

### Explosion protection

II2G Ex ib IIC T6 Gb

### Scope of delivery

- SONOCONTROL 15
- Operating manual
- Magnet

### Accessories

- Sensor connector M12x1
- Mounting set (coupling medium included)