

# Intrinsically safe submersible pressure transmitter

## For applications in hazardous areas

### Model IL-10

WIKA data sheet PE 81.23



for further approvals  
see page 6

#### Applications

- Wastewater treatment and biogas production
- Brackish water and fuel tanks in shipbuilding
- Oil and fuel storage tanks
- Mining and gas extraction

#### Special features

- Suitable for all level measurements in hazardous areas
- Explosion protection in accordance with IECEX, ATEX and CSA
- Shipbuilding approval in accordance with GL
- Ingress protection IP68 up to 300 m immersion depth



#### Intrinsically safe submersible pressure transmitter model IL-10

#### Description

##### For the highest demands

The intrinsically safe model IL-10 submersible pressure transmitter has been designed for the highest requirements of level measurement. Owing to its high accuracy, reliability and its excellent media resistance, it is the ideal solution for almost all level measurements in hazardous areas.

Especially noteworthy are the outstanding approval-related characteristics (IECEX and ATEX). In addition, the IL-10 has the North-American approval CSA.

##### Design

A hermetically sealed and robust stainless steel case with ingress protection IP68 enables immersion depths of up to 300 m.

The submersible pressure transmitter is supplied with a power supply of DC 10 ... 30 V via a suitable isolated barrier and provides an output signal of 4 ... 20 mA, 2-wire.

## Measuring ranges

| Gauge pressure    |                    |           |            |            |           |           |
|-------------------|--------------------|-----------|------------|------------|-----------|-----------|
| bar               | Measuring range    | 0 ... 0.1 | 0 ... 0.16 | 0 ... 0.25 | 0 ... 0.4 | 0 ... 0.6 |
|                   | Overpressure limit | 1         | 1          | 1          | 4         | 4         |
|                   | Measuring range    | 0 ... 1   | 0 ... 1.6  | 0 ... 2.5  | 0 ... 4   | 0 ... 6   |
|                   | Overpressure limit | 4         | 8          | 8          | 19        | 25        |
|                   | Measuring range    | 0 ... 10  | 0 ... 16   | 0 ... 25   |           |           |
|                   | Overpressure limit | 25        | 25         | 30         |           |           |
| inWC              | Measuring range    | 0 ... 50  | 0 ... 100  | 0 ... 150  | 0 ... 250 |           |
|                   | Overpressure limit | 400       | 400        | 1,600      | 1,600     |           |
| psi               | Measuring range    | 0 ... 5   | 0 ... 10   | 0 ... 15   | 0 ... 25  | 0 ... 50  |
|                   | Overpressure limit | 55        | 55         | 55         | 115       | 275       |
|                   | Measuring range    | 0 ... 100 | 0 ... 160  | 0 ... 200  | 0 ... 300 |           |
|                   | Overpressure limit | 360       | 360        | 360        | 360       |           |
| mH <sub>2</sub> O | Measuring range    | 0 ... 1   | 0 ... 1.6  | 0 ... 2.5  | 0 ... 4   | 0 ... 6   |
|                   | Overpressure limit | 10        | 10         | 10         | 40        | 40        |
|                   | Measuring range    | 0 ... 10  | 0 ... 16   | 0 ... 25   | 0 ... 40  | 0 ... 60  |
|                   | Overpressure limit | 40        | 80         | 80         | 190       | 250       |
|                   | Measuring range    | 0 ... 100 | 0 ... 160  | 0 ... 250  |           |           |
|                   | Overpressure limit | 250       | 250        | 300        |           |           |

When choosing the FEP cable, measuring ranges up to and including 0 ... 10 bar, 0 ... 150 psi and 0 ... 100 mH<sub>2</sub>O are available. The given measuring ranges are also available in mbar, kPa and MPa.

## Output signal

### Signal

4 ... 20 mA, 2-wire

### Load in Ω

≤ (power supply - 10 V) / 0.02 A - (cable length in m x 0.14 Ω)

## Voltage supply

### Power supply

DC 10 ... 30 V

## Reference conditions

Temperature: 15 ... 25 °C [59 ... 77 °F]  
 Atmospheric pressure: 860 ... 1,060 mbar [12.5 ... 15.4 psi]  
 Humidity: 45 ... 75 % r. h.  
 Mounting position: Calibrated in vertical mounting position with process connection facing downwards.  
 Power supply: DC 24 V

## Accuracy specifications

### Accuracy at reference conditions

#### Selectable versions

|          |                                 |
|----------|---------------------------------|
| Standard | ≤ ±0.50 % of span               |
| Option   | ≤ ±0.25 % of span <sup>1)</sup> |

<sup>1)</sup> Only for measuring ranges ≥ 0.25 bar (3.6 psi)

Including non-linearity, hysteresis, zero offset and end value deviation (corresponds to measured error per IEC 61298-2).

### Non-linearity (per IEC 61298-2)

≤ ±0.2 % of span

### Non-repeatability

≤ 0.1 % of span

### Temperature error at 0 ... 50 °C

- Mean temperature coefficient of zero point  
 Measuring ranges ≤ 0.25 bar [3.6 psi]: ≤ ±0.4 % of span/10 K  
 Measuring ranges > 0.25 bar [3.6 psi]: ≤ ±0.2 % of span/10 K
- Mean temperature coefficient of span  
 ≤ ±0.2 % of span/10 K

### Long-term stability at reference conditions

≤ ±0.2 % of span/year

## Operating conditions

### Ingress protection (per IEC 60529)

IP68

### Immersion depths

Submersible pressure transmitter with FEP cable: up to 100 m [328 ft]

Submersible pressure transmitter with PUR cable: up to 300 m [984 ft]

### Weight

Submersible pressure transmitter: approx. 200 g [0.44 lbs]

Cable: approx. 80 g/m [0.18 lbs]

### Maximum tensile force of the cable

FEP cable: 350 N without strain relief

500 N with strain relief

PUR cable: 350 N without strain relief

1,000 N with strain relief

### Permissible temperature ranges

Safe use: see page 4

Operation in accordance with the -10 ... +60 °C (-10 ... +85 °C with FEP cable)

data sheet specifications: 14 ... 140 °F (14 ... 185 °F with FEP cable)

Storage: -10 ... +60 °C [14 ... 140 °F]

### Safety-related maximum values for IECEx and ATEX

Voltage  $U_i$ : DC 30 V

Current  $I_i$ : 100 mA

Power  $P_i$ : 1 W

Signal current  $I_i$ : 4 ... 20 mA

Effective internal capacitance  $C_i$

(dependent on cable length): 16.5 nF + 0.1 nF/m

Effective internal inductance  $L_i$

(dependent on cable length): 0  $\mu$ H + 1  $\mu$ H/m

For further operating conditions and safety-related data, please refer to the EC-type examination certificate at [www.wika.com](http://www.wika.com)

## Ambient temperature range, correlation to the instrument category, temperature class (ATEX and IECEx)

| Model                       | EPL           | Ambient and medium temperature <sup>1)</sup> | Temperature class, surface temperature |
|-----------------------------|---------------|--|--|
| Model IL-10, with PUR cable | Ma            | -30 ... +80 °C                               | not applicable                         |
|                             | Ga, Ga/Gb, Gb | -30 ... +60 °C                               | T6                                     |
|                             |               | -30 ... +80 °C                               | T5                                     |
|                             |               | -30 ... +80 °C                               | T4                                     |
|                             | Da            | -30 ... +40 °C (750 mW)                      | 120 °C                                 |
|                             |               | -30 ... +70 °C (650 mW)                      | 120 °C                                 |
|                             |               | -30 ... +80 °C (550 mW)                      | 120 °C                                 |
| Model IL-10, with FEP cable | Ma            | -30 ... +105 °C                              | not applicable                         |
|                             | Ga, Ga/Gb, Gb | -30 ... +60 °C                               | T6                                     |
|                             |               | -30 ... +80 °C                               | T5                                     |
|                             |               | -30 ... +105 °C                              | T4                                     |
|                             | Da            | -30 ... +40 °C (750 mW)                      | 120 °C                                 |
|                             |               | -30 ... +70 °C (650 mW)                      | 120 °C                                 |
|                             |               | -30 ... +100 °C (550 mW)                     | 120 °C                                 |

1) The respective ambient and medium temperatures are limited by:

- The maximum permissible surface temperature, valid for applications that require EPL Ma (150 °C)
- Temperature class assignment, valid for gas applications that require EPL Ga or Gb (maximum ambient temperature)
- The permissible power, Pi, valid for dust applications that require EPL Da or Db (maximum ambient temperature)
- Cable properties (minimum and maximum ambient temperature)

## Temperature range (CSA)

| Model                | Ambient and medium temperature | Temperature class |
|----------------------|--------------------------------|-------------------|
| IL-10 with PUR cable | -20 ... +60 °C                 | T6                |
|                      | -20 ... +80 °C                 | T5                |
|                      | -20 ... +80 °C                 | T4                |
| IL-10 with FEP cable | -20 ... +60 °C                 | T6                |
|                      | -20 ... +80 °C                 | T5                |
|                      | -20 ... +105 °C                | T4                |

## Electrical connection

### Reverse polarity protection

U<sub>+</sub> vs. U<sub>-</sub>

### Insulation voltage

DC 500 V

### Cable lengths

| Selectable versions |     |    |     |     |     |
|---------------------|-----|----|-----|-----|-----|
| Metres (m)          | 1.5 | 3  | 5   | 10  | 15  |
|                     | 20  | 25 | 30  | 40  | 50  |
|                     | 60  | 80 | 100 | 200 | 300 |
| Feet (ft)           | 5   | 10 | 20  | 30  | 40  |
|                     | 50  |    |     |     |     |

Other lengths on request.

### Connection diagram

| Cable outlet  |                |       |
|---|----------------|-------|
|  | U <sub>+</sub> | brown |
|   | U <sub>-</sub> | green |
|   | Shield         | grey  |

Transparent ventilation tube serves for pressure compensation between the interior of the instrument and the environment. Do not plug.

## Process connections

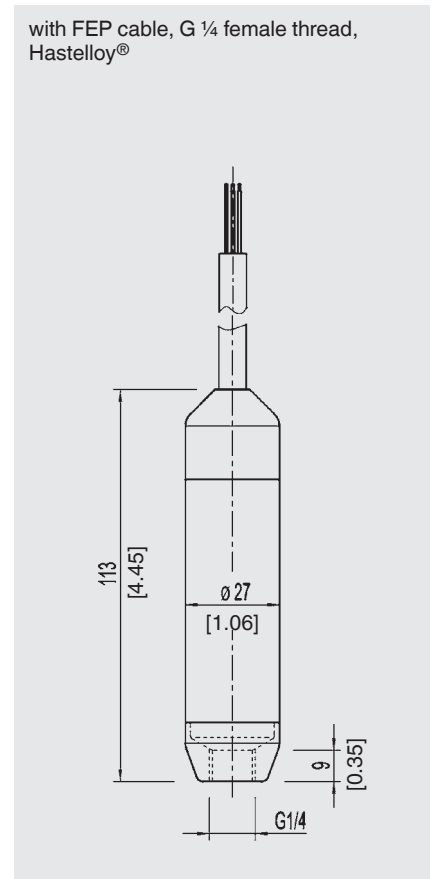
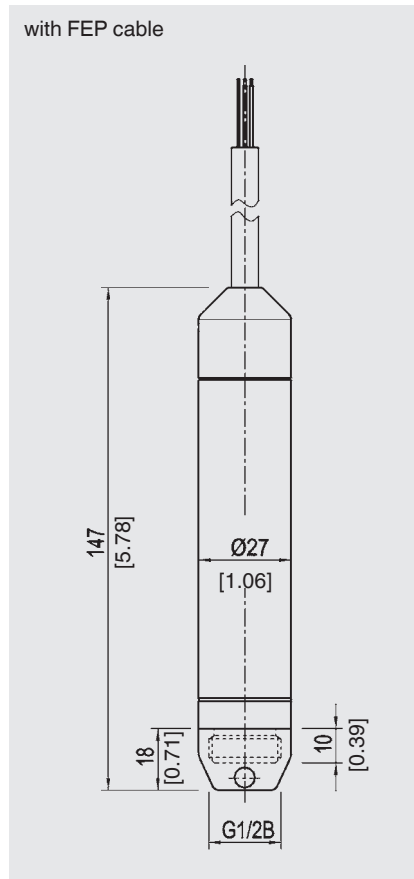
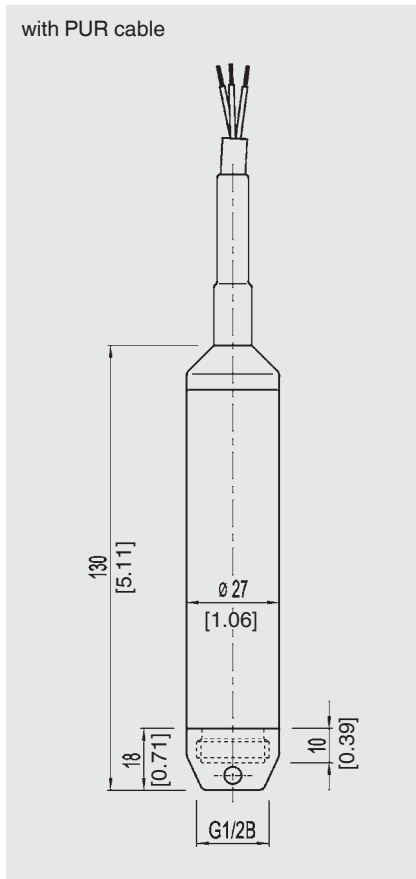
| Selectable versions |  |
|---------------------|--|
| Standard            | G ½ B                                  |
| Option              | G ¼ female thread (only in Hastelloy®) |

## Materials




### Wetted parts






|                                  | Standard             | Option     |
|----------------------------------|----------------------|------------|
| Case, sensor, process connection | Stainless steel 316L | Hastelloy® |
| Protection cap                   | Stainless steel 316L | -          |
| Cable                            | PUR                  | FEP        |

## Dimensions in mm [in]



## Approvals

| Logo   | Description   | Country                            |            |                               |  |                               |                                    |  |            |                               |  |              |                               |  |        |                   |                     |
|--|---|------------------------------------|------------|-------------------------------|--|-------------------------------|------------------------------------|--|------------|-------------------------------|--|--------------|-------------------------------|--|--------|-------------------|---------------------|
| <br> | <p><b>EU declaration of conformity</b></p> <ul style="list-style-type: none"> <li>EMC directive<br/>EN 61326 emission (group 1, class B) and interference immunity (industrial application)</li> </ul> <p>The existence of strong electromagnetic fields in a frequency range of &lt; 2.7 GHz can result in increased measuring errors up to 1 %. Do not install the instruments in the vicinity of strong electromagnetic sources of interference (e.g. transmitting devices, radio equipment), or use sheath current filters where applicable.</p> <ul style="list-style-type: none"> <li>RoHS directive</li> <li>ATEX directive           <table border="0" style="width: 100%;"> <tr> <td style="width: 30%;">Ex i</td> <td style="width: 40%;">Zone 1 gas</td> <td style="width: 30%;">[II 2G Ex ia IIC T4/T5/T6 Gb]</td> </tr> <tr> <td></td> <td>Zone 1 mounting to zone 0 gas</td> <td>[II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb]</td> </tr> <tr> <td></td> <td>Zone 0 gas</td> <td>[II 1G Ex ia IIA T4/T5/T6 Ga]</td> </tr> <tr> <td></td> <td>Zone 20 dust</td> <td>[II 1D Ex ia IIIC T120 °C Da]</td> </tr> <tr> <td></td> <td>Mining</td> <td>[I M1 Ex ia I Ma]</td> </tr> </table> </li> </ul> | Ex i                               | Zone 1 gas | [II 2G Ex ia IIC T4/T5/T6 Gb] |  | Zone 1 mounting to zone 0 gas | [II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb] |  | Zone 0 gas | [II 1G Ex ia IIA T4/T5/T6 Ga] |  | Zone 20 dust | [II 1D Ex ia IIIC T120 °C Da] |  | Mining | [I M1 Ex ia I Ma] | European Community  |
| Ex i   | Zone 1 gas  | [II 2G Ex ia IIC T4/T5/T6 Gb]      |            |                               |  |                               |                                    |  |            |                               |  |              |                               |  |        |                   |                     |
|  | Zone 1 mounting to zone 0 gas   | [II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb] |            |                               |  |                               |                                    |  |            |                               |  |              |                               |  |        |                   |                     |
|  | Zone 0 gas  | [II 1G Ex ia IIA T4/T5/T6 Ga]      |            |                               |  |                               |                                    |  |            |                               |  |              |                               |  |        |                   |                     |
|  | Zone 20 dust  | [II 1D Ex ia IIIC T120 °C Da]      |            |                               |  |                               |                                    |  |            |                               |  |              |                               |  |        |                   |                     |
|  | Mining  | [I M1 Ex ia I Ma]                  |            |                               |  |                               |                                    |  |            |                               |  |              |                               |  |        |                   |                     |
|   | <p><b>IECEx</b></p> <p>Hazardous areas</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 30%;">Ex i</td> <td style="width: 40%;">Zone 1 gas</td> <td style="width: 30%;">[Ex ia IIC T4/T5/T6 Gb]</td> </tr> <tr> <td></td> <td>Zone 1 mounting to zone 0 gas</td> <td>[Ex ia IIC T4/T5/T6 Ga/Gb]</td> </tr> <tr> <td></td> <td>Zone 0 gas</td> <td>[Ex ia IIA T4/T5/T6 Ga]</td> </tr> <tr> <td></td> <td>Zone 20 dust</td> <td>[Ex ia IIIC T120 °C Da]</td> </tr> <tr> <td></td> <td>Mining</td> <td>[Ex ia I Ma]</td> </tr> </table>  | Ex i                               | Zone 1 gas | [Ex ia IIC T4/T5/T6 Gb]       |  | Zone 1 mounting to zone 0 gas | [Ex ia IIC T4/T5/T6 Ga/Gb]         |  | Zone 0 gas | [Ex ia IIA T4/T5/T6 Ga]       |  | Zone 20 dust | [Ex ia IIIC T120 °C Da]       |  | Mining | [Ex ia I Ma]      | IECEx member states |
| Ex i   | Zone 1 gas  | [Ex ia IIC T4/T5/T6 Gb]            |            |                               |  |                               |                                    |  |            |                               |  |              |                               |  |        |                   |                     |
|  | Zone 1 mounting to zone 0 gas   | [Ex ia IIC T4/T5/T6 Ga/Gb]         |            |                               |  |                               |                                    |  |            |                               |  |              |                               |  |        |                   |                     |
|  | Zone 0 gas  | [Ex ia IIA T4/T5/T6 Ga]            |            |                               |  |                               |                                    |  |            |                               |  |              |                               |  |        |                   |                     |
|  | Zone 20 dust  | [Ex ia IIIC T120 °C Da]            |            |                               |  |                               |                                    |  |            |                               |  |              |                               |  |        |                   |                     |
|  | Mining  | [Ex ia I Ma]                       |            |                               |  |                               |                                    |  |            |                               |  |              |                               |  |        |                   |                     |





| Logo  | Description   | Country                     |
|---|---|-----------------------------|
|  | <b>CSA</b> <ul style="list-style-type: none"> <li>■ Safety (e.g. electr. safety, overpressure, ...)</li> <li>■ Hazardous areas</li> </ul> Class I, division 1, groups A, B, C and D<br>Class II, groups E, F and G<br>Class III<br>Canadian zone designation: Class I, zone 0; Ex ia; IIC; IP65; DIP A20<br>US zone designation: Class I, zone 0; AEx ia; IIC; IP65 | USA and Canada              |
|  | <b>EAC</b> <ul style="list-style-type: none"> <li>■ EMC directive</li> </ul>  | Eurasian Economic Community |
|  | <b>KazInMetr</b><br>Metrology, measurement technology   | Kazakhstan                  |
|  | <b>Uzstandard</b><br>Metrology, measurement technology  | Uzbekistan                  |
|  | <b>GL</b><br>Ships, shipbuilding (e.g. offshore)  | International               |
| -   | <b>CRN</b><br>Safety (e.g. electr. safety, overpressure, ...)   | Canada                      |

## Manufacturer's information and certificates

| Logo | Description          |
|------|----------------------|
| -    | China RoHS directive |

Approvals and certificates, see website

## Accessories

|   | Description   | Order number                    |
|---|---|---------------------------------|
|  | <p><b>Additional weight</b><br/>The additional weight increases the dead weight of the submersible pressure transmitter. It simplifies the lowering in monitoring wells, narrow shafts and deep wells. It effectively reduces negative environmental influences of the measuring medium (e.g. turbulent flows) on the measurement result.</p> | 14052341 (stainless steel 316L) |
|  | <p><b>Cable strain relief clamp</b><br/>The cable strain relief clamp ensures easy and secure mechanical fastening of the submersible pressure transmitter's cable. It serves to guide the cable to prevent mechanical damage and to reduce the action of tensile stresses.</p>   | 14052336                        |
|  | <p><b>Filter element</b><br/>The filter element prevents dirt and moisture from entering the venting tube. The waterproof diaphragm also offers a reliable protection for the submersible pressure transmitter in the harshest environments.</p>  | 14052344                        |
|  | <p><b>Intrinsically safe isolated barrier, model IS Barrier</b><br/>Input 0/4 ... 20 mA, supplying and non-supplying Bidirectional HART® signal transmission</p> <p>For details see data sheet AC 80.14</p>   | 14117118                        |

### Ordering information

Model / Measuring range / Accuracy / Process connection / Cable length / Materials / Accessories

© 07/1997 WIKA Alexander Wiegand SE & Co. KG, all rights reserved.  
The specifications given in this document represent the state of engineering at the time of publishing.  
We reserve the right to make modifications to the specifications and materials.

