

# Submersible pressure sensor

## Intrinsic safety Ex ia

### 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	2	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	25	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 $\Omega$

$\leq (\text{power supply} - 10 \text{ V}) / 0.02 \text{ A} - (\text{cable length in m} \times 0.14 \Omega)$

## 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	$\leq \pm 0.50 \text{ % of span}$
Option	$\leq \pm 0.25 \text{ % of span}$ <sup>1)</sup>

1) Only for measuring ranges  $\geq 0.25 \text{ bar}$  (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)

$\leq \pm 0.2 \text{ % of span}$

### Non-repeatability

$\leq 0.1 \text{ % of span}$

### Temperature error at 0 ... 50 °C

■ Mean temperature coefficient of zero point

Measuring ranges  $\leq 0.25 \text{ bar}$  [3.6 psi]:  $\leq \pm 0.4 \text{ % of span/10 K}$

Measuring ranges  $> 0.25 \text{ bar}$  [3.6 psi]:  $\leq \pm 0.2 \text{ % of span/10 K}$

■ Mean temperature coefficient of span

$\leq \pm 0.2 \text{ % of span/10 K}$

### Long-term stability at reference conditions

$\leq \pm 0.2 \text{ % of span/year}$

## 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
	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

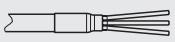
DC 500 V

### 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+	brown
	U-	green
	Shield	grey

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

## Process connections

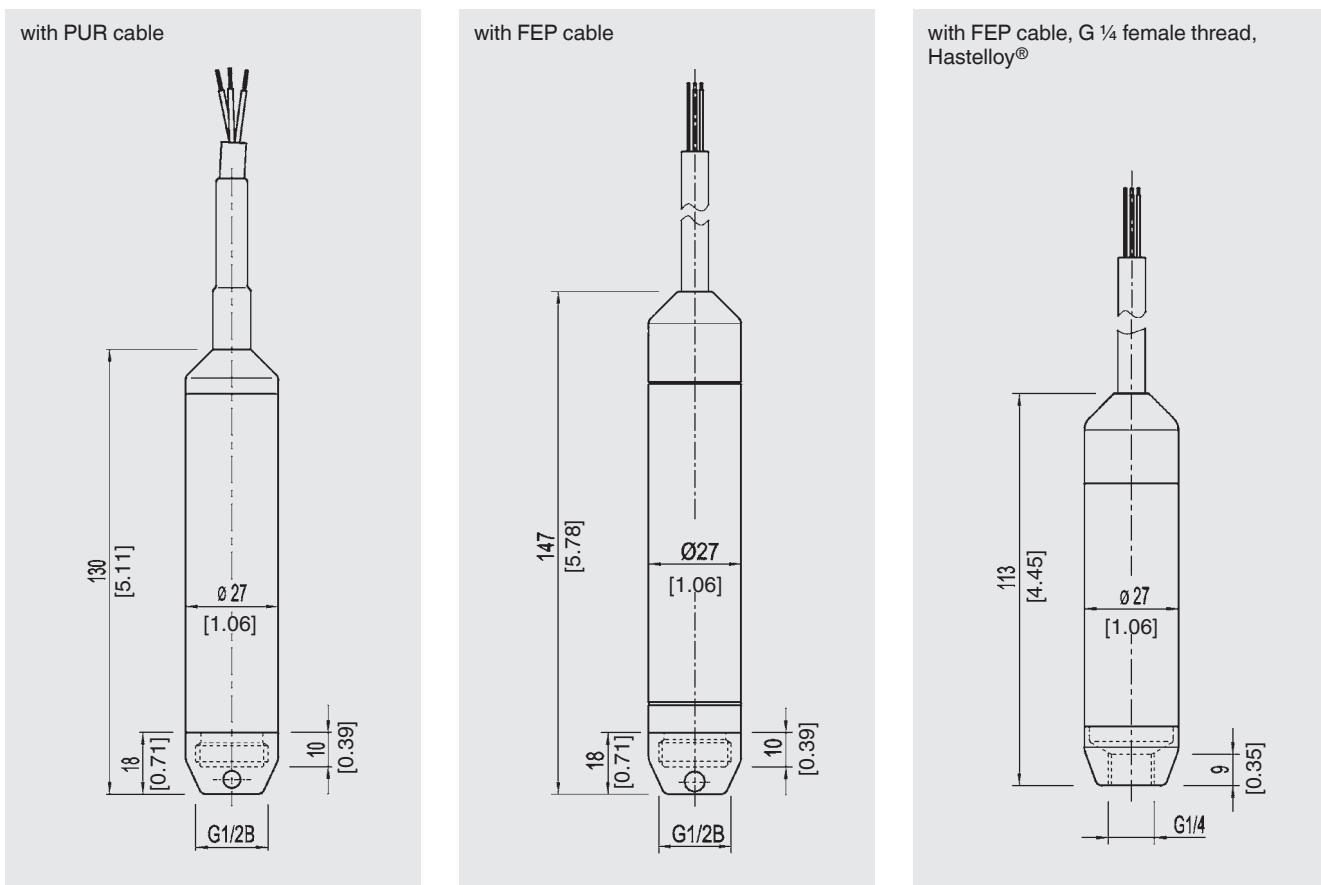
Selectable versions	
Standard	G 1/2 B
Option	G 1/4 female thread (only in Hastelloy®)

## 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															
	<p><b>EU declaration of conformity</b></p> <ul style="list-style-type: none"> <li>EMC directive</li> <li>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</li> </ul> <table> <tbody> <tr> <td>Ex i</td> <td>Zone 1 gas</td> <td>[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> </tbody> </table>	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
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	<p><b>IECEx</b></p> <p>Hazardous areas</p> <table> <tbody> <tr> <td>Ex i</td> <td>Zone 1 gas</td> <td>[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> </tbody> </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
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Logo	Description	Country
	<b>CSA</b> <ul style="list-style-type: none"> <li>■ Safety (e.g. electr. safety, overpressure, ...)</li> <li>■ Hazardous areas           <ul style="list-style-type: none"> <li>Class I, division 1, groups A, B, C and D</li> <li>Class II, groups E, F and G</li> <li>Class III</li> </ul> </li> </ul> Canadian zone designation: Class I, zone 0; Ex ia; IIC; IP65; DIP A20 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> Metrology, measurement technology	Kazakhstan
	<b>Uzstandard</b> Metrology, measurement technology	Uzbekistan
	<b>DNV</b> Ships, shipbuilding (e.g. offshore)	International
-	<b>CRN</b> Safety (e.g. electr. safety, overpressure, ...)	Canada

## Manufacturer's information and certificates

Logo	Description
-	China RoHS directive

Approvals and certificates, see website

## Accessories

Image	Description	Order number
	<p><b>Additional weight</b>            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>            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>            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>            Input 0/4 ... 20 mA, supplying and non-supplying            Bidirectional HART® signal transmission              For details see data sheet AC 80.14</p>	14117118

## Ordering information

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

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