Intrinsically safe submersible pressure transmitter
For applications in hazardous areas
Model IL-10

for further approvals
see page 4

Applications

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

Special features

- Suitable for all level measurements in hazardous areas
- Explosion protection in accordance with ATEX, FM and CSA
- Shipbuilding approval in accordance with GL
- Ingress protection IP 68 up to 984 ft (300 m) immersion depth

Intrinsically safe submersible pressure transmitter model IL-10

Description

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

Especially noteworthy are the outstanding approval-related characteristics (CENELEC approval per ATEX). In addition, the model IL-10 has the North-American approvals FM (USA) and CSA (Canada).

Design
A hermetically sealed and robust stainless steel case with an ingress protection IP 68 enables immersion depths of up to 984 ft (300 m).

The submersible pressure transmitter is supplied with a power supply of DC 10 ... 40 V via a suitable isolated barrier and provides an output signal of 4 ... 20 mA, 2-wire.

Data sheets showing similar products:
Submersible pressure transmitter; model LS-10; see data sheet PE 81.09
High-performance submersible pressure transmitter; model LH-20; see data sheet PE 81.56

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	1.5	2	2	3
	Measuring range	**0 ... 1**	**0 ... 1.6**	**0 ... 2.5**	**0 ... 4**	**0 ... 6**
	Overpressure limit	5	8	8	10	10
	Measuring range	**0 ... 10**	**0 ... 16**	**0 ... 25**		
	Overpressure limit	10	16	25		
inWC	**Measuring range**	**0 ... 50**	**0 ... 100**	**0 ... 150**	**0 ... 250**	
	Overpressure limit	750	750	750	1,100	
psi	**Measuring range**	**0 ... 5**	**0 ... 10**	**0 ... 15**	**0 ... 25**	**0 ... 50**
	Overpressure limit	30	45	70	120	150
	Measuring range	**0 ... 100**	**0 ... 160**	**0 ... 200**	**0 ... 300**	
	Overpressure limit	150	160	200	300	
mH_2O	**Measuring range**	**0 ... 1**	**0 ... 1.6**	**0 ... 2.5**	**0 ... 4**	**0 ...6**
	Overpressure limit	10	15	20	20	30
	Measuring range	**0 ... 10**	**0 ... 16**	**0 ... 25**	**0 .. 40**	**0 ... 60**
	Overpressure limit	50	80	80	100	100
	Measuring range	**0 ... 100**	**0 ... 160**	**0 ... 250**		
	Overpressure limit	100	160	250		

When choosing the FEP cable, measuring ranges up to and including 0 ...10 bar, 0 ... 150 psi and 0 ... 100 mH_2O 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 data

Accuracy at reference conditions
Measuring ranges < 0.25 bar (3.6 psi): ≤ ±0.50 % of span
Measuring ranges ≥ 0.25 bar (3.6 psi): ≤ ±0.25 % of span

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 32 ... 122 °F (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)
IP 68

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 (0.054 lbs/ft)

Maximum tensile force of the cable
FEP cable: up to 350 N without strain relief
up to 500 N with strain relief
PUR cable: up to 350 N without strain relief
up to 1,000 N with strain relief

Permissible temperature ranges
Medium: see table
Storage: -10 ... +60 °C (14 ... 140 °F)

Cable material	Category	Additional marking	Ambient and medium temperature (°C)
PUR	1G 2G	EEx ia IIA	-10 ≤ Ta ≤ +60 (T6) -10 ≤ Ta ≤ +60 (T5) -10 ≤ Ta ≤ +60 (T4)
	1D 2D	IP 65 T80 °C	-10 ≤ Ta ≤ +60
	M1	EEx ia I	-10 ≤ Ta ≤ +60
FEP	1G 2G	EEx ia IIA	-10 ≤ Ta ≤ +60 (T6) -10 ≤ Ta ≤ +80 (T5) -10 ≤ Ta ≤ +85 (T4)
	1D 2D	IP 65 T80 °C	-10 ≤ Ta ≤ +85
	M1	EEx ia I	-10 ≤ Ta ≤ +85

Explosion protection

Ignition protection types ATEX
II 1G EEx ia IIA T4/T5/T6
II 2G EEx ia IIA T4/T5/T6
II 1D IP 65 T80 °C
II 2D IP 65 T80 °C
I M1 EEx ia I

Ignition protection types FM
Intrinsically safe class I, II and III, division 1, groups A, B, C, D, E, F and G
Class I, zone 0, AEx ia IIC dust ignitionproof for class II, III division 1, groups E, F and G

Ignition protection types CSA
Class I, groups A, B, C and D; class II, groups E, F and G; class III
Class I, zone 0; Ex ia; IIC; IP65; DIP A20

Safety-related maximum values for 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): 22 nF + 0.2 nF/m

Effective internal inductance L_i
(dependent on cable length): 100 µH + 2 µH/m

For further operating conditions and safety-related data, please refer to the EC-type examination certificate at www.wika.com

Electrical connection

Reverse polarity protection
U+ vs. U-

Insulation voltage
DC 500 V

Cable lengths

Available cable lengths					
Meter (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				

Connection diagrams

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

Standard	Thread size
-	G ½ B
-	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

CE conformity

EMC directive
2004/108/EC, EN 61326 emission (group 1, class B) and interference immunity (industrial application)

ATEX directive
94/9/EC

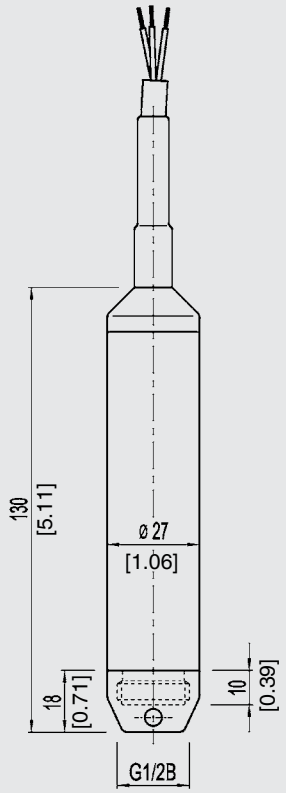
Approvals

- **FM,** ignition protection type “i” - intrinsic safety, USA
- **cCSAus,** ignition protection type “i” - intrinsic safety, North America
- **GL,** ships, shipbuilding, (e.g. offshore) environmental category C, F, EMC 1, Germany
- **GOST-R**, import certificate, Russia
- **CRN**, safety (e.g. electr. safety, overpressure, ...), Canada

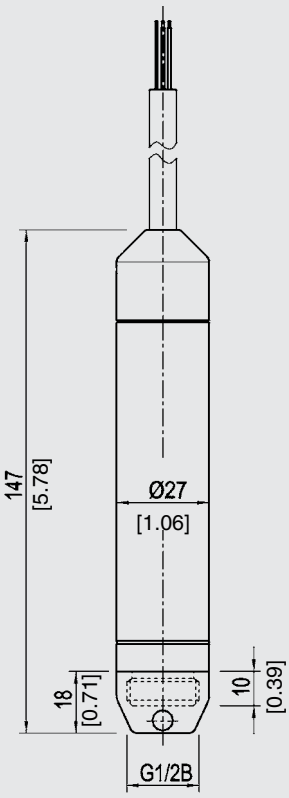
Approvals and certificates, see website

Dimensions in mm [inch]

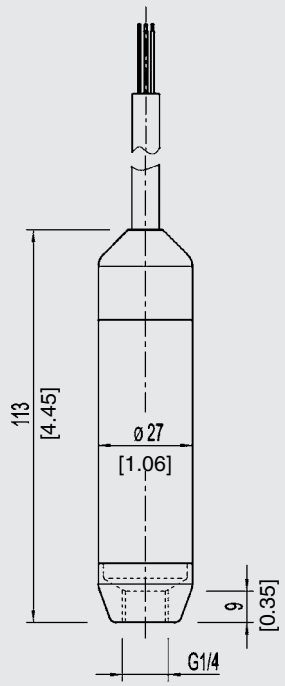
with PUR cable



with FEP cable



with FEP cable, G ¼ B, Hastelloy®



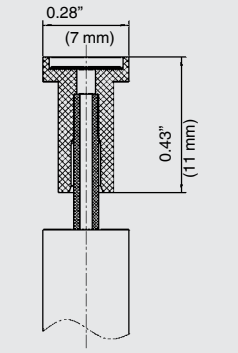
Accessories

	Description	Order no.
	**Additional weight** 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.	14052341 (stainless steel 316L)
	**Cable strain relief clamp** 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.	14052336
	**Filter element** The filter element prevents dirt and moisture from entering the venting tube. The watertight diaphragm also offers a reliable protection for the submersible pressure transmitter in the harshest environments.	14052344
	**Isolated barrier, model KFD2-STC-Ex1** Dimensions: 20 x 122 x 115 mm Input/Output signal: 4 ... 20 mA, 0 ... 20 mA Input voltage: DC 20 ... 35 V Transmitter power supply: max DC 25.4 V Ambient temperature: -20 ... +60 °C Ingress protection: IP 20 Mounting: Standard rail, wall in non-hazardous area Explosion protection: II (1) G [EEx ia] IIC	2341268

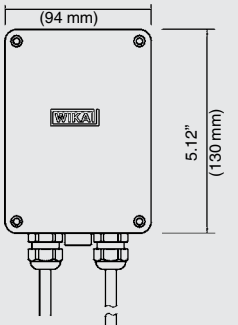
Ordering information
Model / Measuring range / Process connection / Cable length / Materials / Accessories

Accessories

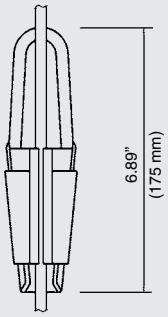
Dimensions in inches (mm)



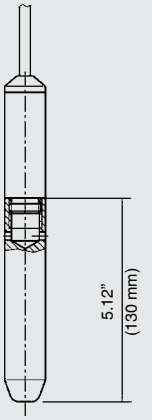
Vent tube filter
Part# 7193131
The optional Teflon® vent tube filter protects the vent opening and protects against the entry of dirt and moisture.



Cable junction box
Part# 2459686
The cable junction box is rated NEMA 4 / IP 67 and is suitable for mounting outside tanks or shafts or inside dry control boxes. Can be wall or DIN rail mounted.

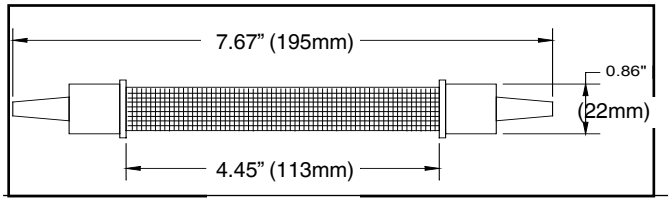


Cable clamp
Part# 2074257
The cable clamp secures the cable without bending or kinking that can damage the cable vent tube or outer jacket.

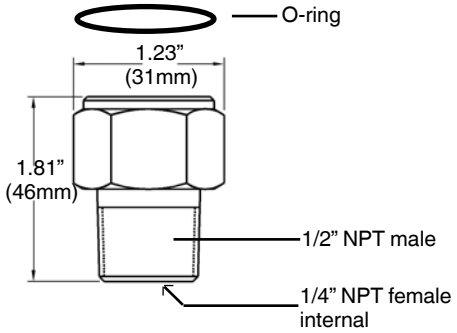


Additional weight
Part# 1524399
The additional weight replaces the protective cap and helps to stabilize the transmitter in turbulent conditions. Weight: approximately 1.1 lb, 316 SS.

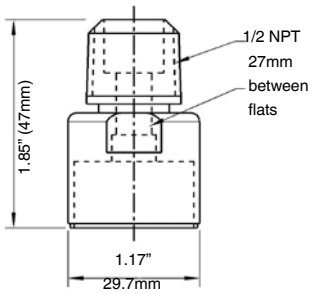
Desiccant drying cartridge part # 9836700
The desiccant drying cartridge helps prevent moisture buildup inside the vent tube.



NPT adapter Part# 1631322
The 316 SS G1/2 adapter replaces the removable protective cap and converts the threads to 1/2"NPT male external, 1/4" female internal threads. Includes O-ring.



Conduit adapter Part# 50476114
316 SS 1/2" NPT male cable conduit adapter.
Must be factory installed.



LevelGuard Anti-clog attachment Part # 50077091

The stainless steel LevelGuard attachment must be factory installed and calibrated.

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