

### Intrinsically Safe Pressure Transmitter for applications in hazardous environments Model IS-10, standard version / IS-11, flush diaphragm

WIKA Data Sheet PE 81.22



#### Applications

- Chemical, Petrochemical
- Oil and gas refining
- Food & Beverage
- Mechanical engineering

#### Special Features

- Pressure ranges from 0 ... 0.1 bar to 0 ... 4,000 bar
- Ex- protection EEx ia I/II C T6 according to ATEX for:
  - Gases, vapours and mist: Zone 0, Zone 1 and Zone 2
  - Mining: Category M1 and M2
- FM, CSA approval for:
  - Intrinsically safe Class I, Division 1, Group A, B, C, D
  - Class I, Zone 0, AEx ia II C
- Special versions for oxygen application



Fig. left: Pressure transmitter IS-10  
Fig. right: Pressure transmitter IS-11

## Description

### Hazardous environments

The intrinsically safe pressure transmitters have been specially designed to comply with the most difficult requirements of industrial applications and represent an ideal solution for almost any task in hazardous environments.

The most important features are the wide ranging certifications for hazardous applications (CENELEC certificate complying with ATEX).

Furthermore this IS pressure transmitter also has FM (USA) and CSA (Canada) approvals.

A stock program ensures short delivery times.

### Structure

All wetted parts are made of stainless steel and are completely welded. Therefore there are no restrictions of the sealing material based on the pressure medium.

The compact case is also made of stainless steel and provides at least IP 65 ingress protection (special versions up to IP 68).

The transmitters are supplied via appropriate intrinsically safe line transformers, or via typical zener diode barriers with an input power of 10 ... 30 V. The output signal is 4 ... 20 mA, 2-wire.

An oxygen version is available for the pressure ranges from 0 ... 0.25 bar up to 0 ... 1600 bar.

**Specifications****Model IS-10, IS-11****Specifications without model designation apply for all models.**

Pressure ranges *)		0.1	0.16	0.25	0.4	0.6	1	1.6	2.5
Over pressure safety		1	1.5	2	2	4	5	10	10
Burst pressure		2	2	2.4	2.4	4.8	6	12	12
Pressure ranges *)		4	6	10	16	25	40	60	100
Over pressure safety		17	35	35	80	50	80	120	200
Burst pressure		20.5	42	42	96	96	400	550	800
Pressure ranges *)		160	250	400	600	1000 <sup>1)</sup>	1600 <sup>1)</sup>	2500 <sup>1)</sup>	4000 <sup>1)</sup>
Over pressure safety		320	500	800	1200	1500	2000	3000	4400
Burst pressure		1000	1200	1700 <sup>2)</sup>	2400 <sup>2)</sup>	3000	4000	5000	7000
{Vacuum, gauge pressure, compound range, absolute pressure are available}									
<sup>1)</sup> Only model IS-10.									
<sup>2)</sup> For model IS-11: the value specified in the table applies only when sealing is realised with the sealing ring underneath the hex. Otherwise max. 1500 bar applies.									
Materials									
■ Wetted part									
» Model IS-10		Stainless steel							
» Model IS-11		Stainless steel                      O-ring: NBR {FPM/FKM or EPDM}							
■ Case		Stainless steel							
■ Internal transmission fluid <sup>3)</sup>		Synthetic oil {Halocarbon oil for oxygen applications}							
<sup>3)</sup> Not for IS-10 with pressure ranges > 25 bar									
Power supply UB	UB in VDC	10 < UB ≤ 30							
Signal output and maximum ohmic load R <sub>A</sub>		4 ... 20 mA, 2-wire							
Adjustability zero/span	R <sub>A</sub> in Ohm	R <sub>A</sub> ≤ (UB - 10 V) / 0.02 A - (length of flying leads in m x 0.14 Ohm)							
Response time (10 ... 90 %)	%	± 5 using potentiometers inside the instrument							
Dielectric strength	ms	≤ 1							
Accuracy	% of span	≤ 0.25 {0.125} <sup>4)</sup> (BFSL)							
	% of span	≤ 0.5 {0.25} <sup>4) 5)</sup>							
<sup>4)</sup> Accuracy { } for pressure ranges ≥ 0.25 bar									
<sup>5)</sup> Including non-linearity, hysteresis, zero point and full scale error (corresponds to error of measurement per IEC 61298-2)									
Adjusted in vertical mounting position with lower pressure connection									
Non-linearity	% of span	≤ 0.2                      (BFSL) according to IEC 61298-2							
Non-repeatability	% of span	≤ 0.1							
1-year stability	% of span	≤ 0.2                      (at reference conditions)							
Permissible temperature of									
■ Medium <sup>6) 7) 8) 9) *)</sup>		-30 ... +105 °C				-22 ... +221 °F			
■ Ambience <sup>6) 7) 9)</sup>		-30 ... +105 °C				-22 ... +221 °F			
■ Storage <sup>6)</sup>		-30 ... +105 °C				-22 ... +221 °F			
<sup>6)</sup> Also complies with EN 50178, Tab. 7, Operation (C) 4K4H, Storage (D) 1K4, Transport (E) 2K3									
<sup>7)</sup> Other temperature ranges are possible, depending on the electrical connection; see EC-type examination certificate, e.g. -30 ... +105 °C / -22 ... +221 °F and table page 4.									
<sup>8)</sup> Response time IS-10: 10 ms at medium temp. below -30 °C for pressure ranges up to 25 bar. Response time IS-11: 10 ms at medium temp. below -30 °C.									
Compensated temp. range		0 ... +80 °C				32 ... +176 °F			
Temperature coefficients within compensated temp range									
■ Mean TC of zero	% of span	≤ 0.2 / 10 K (< 0.4 for pressure ranges ≤ 0.25 bar)							
■ Mean TC of range	% of span	≤ 0.2 / 10 K							
CE-conformity									
■ Pressure equipment directive		97/23/EC							
■ EMC directive		89/336/EEC emission (class B) and immunity according to EN 61 326							
■ Directive ATEX of equipment intended for use in potentially explosive atmospheres		94/9/EC							
Ex-protection	ATEX	Category <sup>9)</sup> 2G {M1, M2, 1/2G}							

**Specifications**

**Model IS-10, IS-11**

Ignition protection type		EEx ia I/II C T4, EEx ia I/II C T5, EEx ia I/II C T6
		<sup>9)</sup> <b>Read the operating conditions and safety-relevant data in the EC-type examination certificate in any case (DMT 00 ATEX E 045 X)</b>
Ex-protection	FM, CSA	Class I, II and III
Ignition protection type		Intrinsic safe Class I, Division 1, Group A, B, C, D and Class I, Zone 0 AEx ia II C
HF-immunity BURST	V/m KV	10 {30} 4
Shock resistance	g	1000 according to IEC 60068-2-27 (mechanical shock)
Vibration resistance	g	20 according to IEC 60068-2-6 (vibration under resonance)
Wiring protection		
■ Short-circuit proofness		Sig+ towards UB-
■ Reverse polarity protection		UB+ towards UB-
Weight	kg	Approx. 0,2

<sup>9)</sup> In an oxygen version model IS-21 is not available. In an oxygen version model IS-20 is only available in gauge pressure ranges  $\geq 0.25$  bar with media temperatures between  $-20 \dots +60$  °C /  $-4 \dots +140$  °F and using stainless steel or Elgilloy® wetted parts. Cannot be manufactured for absolute pressure ranges  $< 1$  bar abs.

{ } Items in curved brackets are optional extras for additional price.

**Dimensions in mm**

Ingress Protection IP per IEC 60529. The ingress protection classes specified only apply while the pressure transmitter is connected with female connectors that provide the corresponding ingress protection.

Permissible temperature ranges depending on electrical connections; see table page 4.

**Electrical connections**

DIN 175301-803 A

L-connector

for conductor cross section

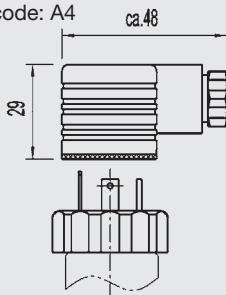
up to max.  $1.5 \text{ mm}^2$ ,

conductor outer diameter

6-8 mm

IP 65

Order code: A4



M 12x1

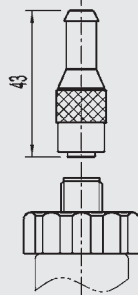
Circular connector

4-pin

IP 67

Order code: M4

\*)



Flying leads

for conductor cross section

$0.5 \text{ mm}^2$ , AWG 20 with end

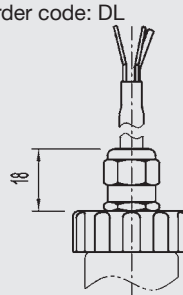
splices, conductor outer

diameter 6.8 mm,

PUR

IP 67

Order code: DL



Flying leads

zero/span not adjustable,

for conductor cross section up

to max.  $0.5 \text{ mm}^2$ , AWG 20 with

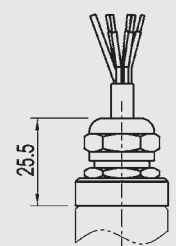
end splices, conductor outer

diameter 6.8 mm,

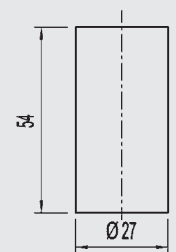
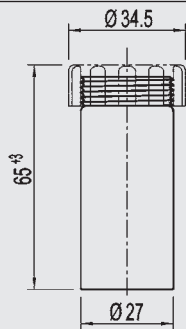
PUR

IP 68

Order code: EM



**Case**

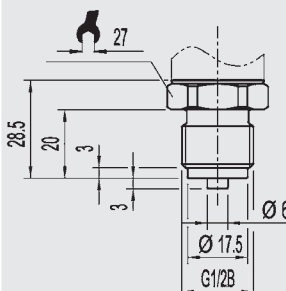


**Pressure connections IS-10**

G 1/2

EN 837

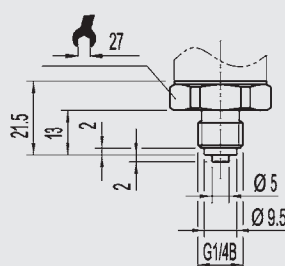
Order code: GD



G 1/4

EN 837

Order code: GB



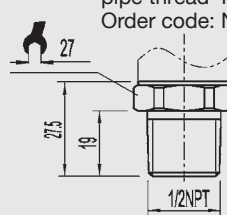
1/2 NPT

per „Nominal size for

US standard tapered

pipe thread NPT“

Order code: ND



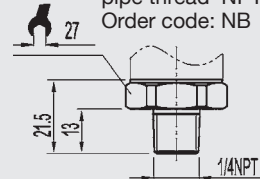
1/4 NPT

per „Nominal size for

US standard tapered

pipe thread NPT“

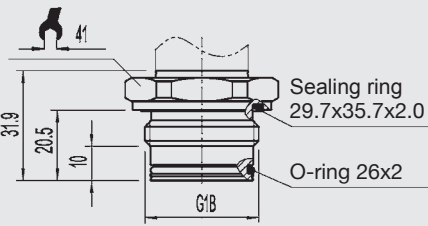
Order code: NB



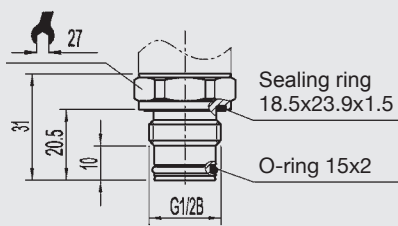
\*) Connectors are not included in delivery.

**Pressure connections IS-11, flush diaphragm**

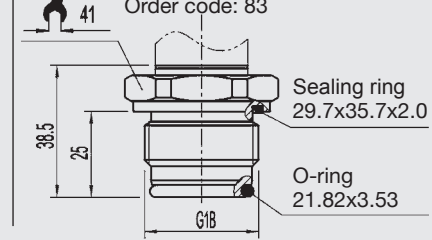
G 1  
0 ... 0.1 up to 0 ... 1.6 bar  
Order code: 85



G 1/2  
0 ... 2.5 up to 0 ... 600 bar  
Order code: 86



G 1  
acc. EHEDG \*\*)  
0 ... 0.1 up to 0 ... 16 bar  
Order code: 83



For installation and safety instructions see the operating instructions for this product.

For tapped holes and welding sockets please see Technical Information IN 00.14 for download at [www.wika.de](http://www.wika.de) -Service

\*\*) European Hygienic Equipment Design Group

**Permissible temperature ranges depending on electrical connections**

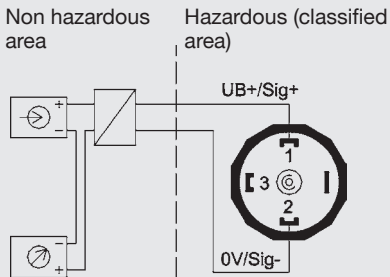
Electrical connections	Order-code	Category	Ambience-/ Medium temperature range	
DIN 175301-803 A L-Connector	A4	1/2 G <sup>*)</sup> , 2G (IIC)	-40 ... +105 °C (T4)	-40 ... +221 °F (T4)
		M1 <sup>*)</sup> , M2	-40 ... +105 °C	-40 ... +221 °F
M 12x1 Circular connector	M4	1/2 G <sup>*)</sup> , 2G (IIC)	-25 ... +90 °C (T4)	-13 ... +194 °F (T4)
		M1 <sup>*)</sup> , M2	-25 ... +90 °C	-13 ... +194 °F
Flying leads	DL	1/2 G <sup>*)</sup> , 2G (IIC)	-20 ... +80 °C (T4)	-4 ... +176 °F (T4)
		M1 <sup>*)</sup> , M2	-20 ... +80 °C	-4 ... +176 °F
Flying leads PUR zero/span not adjustable	EM	1/2 G <sup>*)</sup> , 2G (IIC)	-20 ... +80 °C (T5)	-4 ... +176 °F (T5)
		M1 <sup>*)</sup> , M2	-20 ... +80 °C	-4 ... +176 °F

\*) Pressure connection according to 4.5 EN 50284

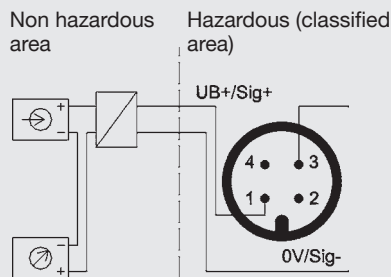
**Wiring details**

**2-wire**

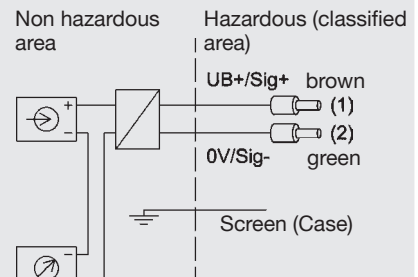
DIN 175301-803 A L-Connector



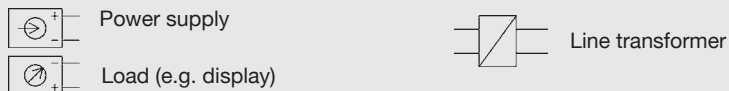
M 12x1, 4-pin Circular connector



Flying leads with 1.5 m of cable



**Legend:**



**Further information**

You can obtain further information (data sheets, instructions, etc.) via our internet address [www.wika.de](http://www.wika.de)

Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing. Modifications may take place and materials specified may be replaced by others without prior notice. dem derzeitigen Stand der Technik.



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