Pressure transmitter with flameproof enclosure
For applications in explosion-protected areas
Models E-10 and E-11

for further approvals see page 6

Applications

- Borehole monitoring
- Refineries and petrochemical industry
- Drilling platforms and pipelines
- Gas compressors

Special features

- CSA and FM approved as “explosionproof” for class I, div. 1 hazardous areas
- ATEX and IECEx approved as “flameproof enclosure” for II 2G Ex db IIC T6...T1 Gb
- Current or voltage output
- Designed for harsh ambient conditions
- Low-power version available as an option

Fig. left: **Model E-10, standard version (ATEX, IECEx)**
Fig. centre: **Model E-10, standard version (FM, CSA)**
Fig. right: **Model E-11, with flush diaphragm (FM, CSA)**

Description

The model E-10 and E-11 flameproof pressure transmitters have been designed specifically for the high demands of industrial oil and gas applications.

These pressure transmitters can be delivered with various analogue signals from 4 ... 20 mA to a low-power version with DC 1 ... 5 V.
They feature an exceptionally high resistance to vibration, pressure spikes and moisture ingress. Furthermore, these pressure transmitters fulfil IP67 (NEMA 4x) ingress protection.

On each individual instrument a comprehensive quality control and calibration is performed, so that an accuracy of ≤ 0.5 % can be ensured. Temperature compensation guarantees accuracy and long-term stability, even with strong fluctuations in the ambient temperature.

The models E-10 and E-11 are suitable for sour gas applications and feature particularly high resistance against sulphide stress cracking when in contact with sulphurous gases.

The pressure transmitters are approved as “explosionproof” for class I, II, III, div. 1 hazardous areas to FM and CSA as well as “flameproof” for II 2G Ex db IIC T6...T1 Gb to ATEX and IECEx.

Data sheets showing similar products:
High-quality pressure transmitter for general industrial applications; model S-20; see data sheet PE 81.61
Pressure transmitter for viscous and particle-laden media; model S-11; see data sheet PE 81.02
Intrinsically safe pressure transmitter; model IS-2x; see data sheet PE 81.50
Non-incendive pressure transmitter; model N-1x; see data sheet PE 81.26

Measuring ranges

Gauge pressure							
bar	**Measuring range**	**0 ... 0.4**	**0 ... 0.6**	**0 ... 1**	**0 ... 1.6**	**0 ... 2.5**	**0 ... 4**
	Overpressure limit	3.1	3.1	3.1	6.2	6.2	14
	Measuring range	**0 ... 6**	**0 ... 10**	**0 ... 16**	**0 ... 25**	**0 ... 40**	**0 ... 60**
	Overpressure limit	31	31	62	62	80	120
	Measuring range	**0 ... 100**	**0 ... 160**	**0 ... 250**	**0 ... 400**	**0 ... 600** [2]	**0 ... 1,000** [1]
	Overpressure limit	200	320	500	800	1,200	1,500
psi	**Measuring range**	**0 ... 5**	**0 ... 10**	**0 ... 15**	**0 ... 25**	**0 ... 30**	**0 ... 60**
	Overpressure limit	45	45	45	89	89	203
	Measuring range	**0 ... 100**	**0 .. 160**	**0 ... 200**	**0 ... 250**	**0 ... 300**	**0 ... 500**
	Overpressure limit	449	899	899	899	899	1,160
	Measuring range	**0 ... 600**	**0 ... 750**	**0 ... 1,000**	**0 ... 1,500**	**0 ... 2,000**	**0 ... 3,000**
	Overpressure limit	1,160	1,740	1,740	2,900	4,600	7,200
	Measuring range	**0 ... 5,000**	**0 ... 8,000** [2]	**0 ... 10,000** [1]	**0 ... 15,000** [1]		
	Overpressure limit	11,600	17,400	17,400	21,750		

1) Measuring range not for model E-11.
2) Measuring range not for model E-11 with FM and CSA approval

Absolute pressure						
bar	**Measuring range**	**0 ... 0.4**	**0 ... 0.6**	**0 ... 1**	**0 ... 1.6**	**0 ... 2.5**
	Overpressure limit	2	4	5	10	10
	Measuring range	**0 ... 4**	**0 ... 6**	**0 ... 10**	**0 ... 16**	
	Overpressure limit	17	35	35	80	
psi	**Measuring range**	**0 ... 15**	**0 ... 25**	**0 ... 30**	**0 ... 60**	**0 ... 100**
	Overpressure limit	72	145	145	240	500

Vacuum and +/- measuring range						
bar	**Measuring range**	**-1 ... 0**	**-1 ... +0.6**	**-1 ... +1.5**	**-1 ... +3**	**-1 ... +5**
	Overpressure limit	2	4	5	10	17
	Measuring range	**-1 ... +9**	**-1 ... +15**	**-1 ... +25**		
	Overpressure limit	35	35	50		
psi	**Measuring range**	**-30 inHg ... 0**	**-30 inHg ... +30**	**-30 inHg ... +60**	**-30 inHg ... +100**	**-30 inHg ... +200**
	Overpressure limit	29	145	240	500	1,160
	Measuring range	**-30 inHg ... +300**				
	Overpressure limit	1,160				

The given measuring ranges are also available in mbar, MPa, kPa, kg/cm^2 and further units.

Vacuum tightness
Yes

Output signals

Signal type	Signal
Current (2-wire)	4 ... 20 mA
Voltage (3-wire)	DC 0 ... 5 V
	DC 0.5 ... 4.5 V
	DC 1 ... 5 V (low power)
	DC 0 ... 10 V

Load in Ω

4 ... 20 mA: ≤ (power supply - 10 V) / 0.02 A
DC 0 ... 5 V: > maximum output signal / 1 mA
DC 0.5 ... 4.5 V: > 100k
DC 1 ... 5 V > 100k
DC 0 ... 10 V: > maximum output signal / 1 mA

Voltage supply

Power supply
The power supply depends on the selected output signal.

4 ... 20 mA: DC 10 ... 30 V
DC 0 ... 5 V: DC 10 ... 30 V
DC 0.5 ... 4.5 V: DC 5 ... 30 V
DC 1 ... 5 V: DC 6 ... 30 V
DC 0 ... 10 V: DC 14 ... 30 V

Max. power consumption
1 W

Reference conditions (per IEC 61298-1)

Temperature
15 ... 25 °C [59 ... 77 °F]

Atmospheric pressure
860 ... 1,060 mbar

Humidity
45 ... 75 % r. h.

Power supply
DC 24 V

Mounting position
Calibrated in vertical mounting position with process connection facing downwards.

Accuracy specifications

Accuracy at reference conditions
0.5 % 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 (BFSL)

Non-repeatability
≤ 0.1 % of span

Temperature error in range 0 ... 80 °C [32 ... 176 °F]
Mean temperature coefficient of zero point:
≤ 0.2 % of span/10 K

Mean temperature coefficient of span:
≤ 0.2 % of span/10 K

Settling time
≤ 2 ms
≤ 10 ms (at medium temperature < -30 °C [-22 °F] and measuring range ≤ 0 ... 25 bar; for model E-11)

Long-term stability
≤ 0.2 % of span/year

For the use in in hydrogen applications, please observe technical information IN 00.40 on www.wika.com regarding long-term stability.

Operating conditions

Ingress protection (per IEC 60529)
IP67 (NEMA 4x)

Vibration resistance (per IEC 60068-2-6)
20 g
10 g (for variant ½ NPT male conduit, with potted cable outlet)

Shock resistance (per IEC 60068-2-27)
1,000 g (mechanical shock)
100 g (for variant ½ NPT male conduit, with potted cable outlet)

Permissible temperature ranges

- **for instruments per ATEX and IECEx**

  Ambient and medium:

T6: -40 ... +60 °C	T6: -40 ... +140 °F
T5: -40 ... +75 °C	T5: -40 ... +167 °F
T4: -40 ... +102 °C	T4: -40 ... +215 °F

  Storage:
  -40 ... +102 °C -40 ... +215 °F

  -40 °C [-40 °F] only valid when no sealing is used.
  Sealings from NBR only admissible to -30 °C [-22 °F].
  Sealings from FPM/FKM only admissible to -15 °C [5 °F].

- **for instruments per FM, CSA**

  Ambient and medium:

T6: -40 ... +60 °C	T6: -40 ... +140 °F
T4: -40 ... +105 °C	T4: -40 ... +221 °F

  Storage:
  -40 ... +105 °C -40 ... +221 °F

  -40 °C [-40 °F] only valid when no sealing is used.
  Sealings from NBR only admissible to -30 °C [-22 °F].
  Sealings from FPM/FKM only admissible to -15 °C [5 °F].

Explosion protection

ATEX and IECEx
II 2G Ex db IIC T6...T1 Gb (KEMA 05 ATEX 2240 X)
Ex db IIC T6...T1 Gb (IECEx DEK 15.0048X)

FM
XP / I / 1ABCD / T6, T4
DIP / II, III / 1 EFG / T6, T4 type 4

CSA
Class I, division 1, groups A, B, C and D
Class II, division 1, groups E, F and G
Class III, division 1
Type 4X

Process connections

Process connections for model E-10

Process connection per	Thread size
DIN 3852-E [1]	G ¼ A
EN 837	G ¼ B
	G ¼ female
	G ½ B
ANSI/ASME B1.20.1	⅛ NPT
	¼ NPT
	¼ NPT female
	½ NPT

1) Max. ambient and medium temperature range, sealing for process connection: -30 ... +100 °C

Process connections for model E-11
For the flush process connections there is a limited selection of measuring ranges

Process connection per	Thread size	Available for measuring ranges
-	G ½ B flush	0 ... 2.5 to 0 ... 600 bar
-	G 1 B flush	0 ... 0.4 to 0 ... 1.6 bar

Sealing for model E-11

Sealing for model E-11	
Standard	NBR
Option 1	FPM/FKM
Option 2	EPDM

Sealing material restrictions for G ½ B flush process connection

Material	Max. measuring range			
	T = -40 °C [-40°F]	T = -30 °C [-22 °F]	T = -15 °C [5 °F]	T = 105 °C [221 °F]
NBR	-	600 bar	600 bar	600 bar
FPM/FKM	-	-	400 bar	400 bar
EPDM	200 bar	200 bar	200 bar	200 bar

T = ambient and medium temperature

Materials

Wetted parts

- Stainless steel (additionally Elgiloy® for model E-10 with measuring range > 0 ... 25 bar, NACE-compliant)
- For sealing materials see “Process connections”

Where the medium is hydrogen, contact the manufacturer.

Non-wetted parts

Case from stainless steel
For cable see “Electrical connections”

Internal pressure transmission medium

Synthetic oil (no pressure transmission medium for model E-10 with measuring range > 0 ... 25 bar)

For other materials see WIKA diaphragm seal programme

Electrical connections

Electrical connection	Wire cross-section	Cable diameter	Cable lengths	Material
½ NPT male conduit, with potted cable outlet (ATEX and IECEx approval)	3 x 0.5 mm² AWG20	6.8 mm [0.27 in]	2 m [6.6 ft] 5 m [16.4 ft]	Polyolefin copolymer
½ NPT conduit male, with cable outlet (FM and CSA approval)	3 x 0.56 mm² AWG20	5.4 mm [0.21 in]	up to 9 m [29.5 ft]	PVC
½ NPT male conduit with potted cable leads (FM and CSA approval)	3 x 0.5 mm² AWG20	3 x 2.6 mm [3 x 0.10 in]	up to 9 m [29.5 ft]	Polyolefin

Short-circuit resistance

S_+ vs. U-

Reverse polarity protection

U_+ vs. U-

Insulation voltage

DC 500 V

Connection diagrams

½ NPT male conduit, with potted cable outlet (ATEX and IECEx approval)			
		2-wire	3-wire
	U+	red	red
	U-	black	black
	S+	-	brown
	Shield	Shield connected to case	

½ NPT male conduit with potted cable leads (FM and CSA approval)			
		2-wire	3-wire
	U+	red	red
	U-	black	black
	S+	-	brown
	Shield	green	green

½ NPT conduit male, with cable outlet (FM and CSA approval)			
		2-wire	3-wire
	U+	red	red
	U-	black	black
	S+	-	brown
	Shield	Shield connected to case	

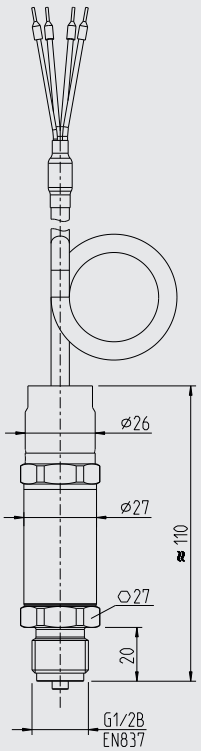
Approvals (option)

Logo	Description	Country
CE Ex	**EC declaration of conformity** ■ EMC directive EN 61326 emission (group 1, class B) and interference immunity (industrial application) ■ Pressure equipment directive ■ ATEX directive, flameproof (Ex d), EN 60079-0, EN 60079-1, EU	European Community
IEC IECEx	**IECEx** Hazardous areas flameproof (Ex d), IEC 60079-0, IEC 60079-1	IECEx member states
FM APPROVED	**FM** Hazardous areas Explosionproof class 3600, class 3615, class 3810, NEMA-250	USA
c SP us	**CSA** ■ Safety (e.g. electr. safety, overpressure, ...) ■ Hazardous areas Class 2258 02, class 2258 82	USA and Canada
EAC Ex	**EAC** ■ Electromagnetic compatibility ■ Hazardous areas	Eurasian Economic Community
	CRN Safety (e.g. electr. safety, overpressure, ...)	Canada

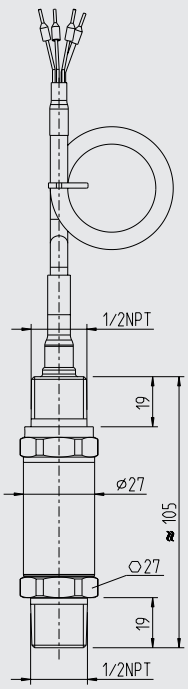
Approvals and certificates, see website

Dimensions in mm

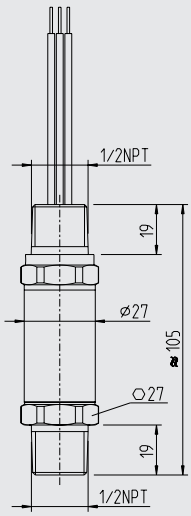
½ NPT male conduit with potted cable outlet (ATEX and IECEx approval)



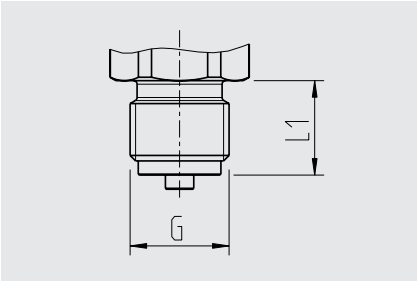
½ NPT male conduit with cable outlet (FM and CSA approval)



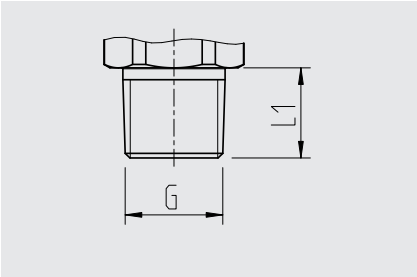
½ NPT male conduit with potted cable leads (FM and CSA approval)



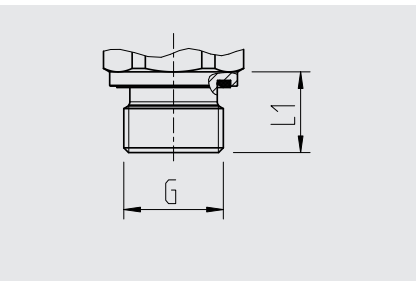
Process connections model E-10



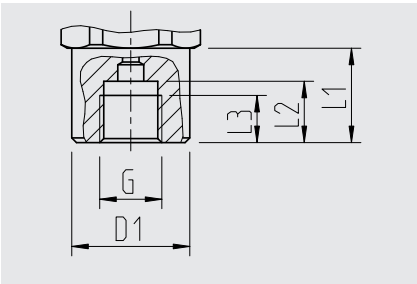
G	L1
G ¼ B	13 [0.51]
G ½ B	20 [0.79]



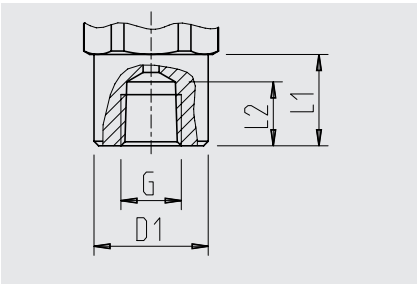
G	L1
⅛ NPT	10 [0.39]
¼ NPT	13 [0.51]
½ NPT	19 [0.75]



G	L1
G ¼ A	14 [0.55]

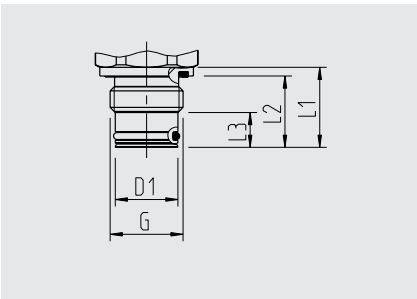


G	L1	L2	L3	D1
G ¼ female	19.5 [0.77]	13 [0.51]	10 [0.39]	Ø17.5 [0.69]

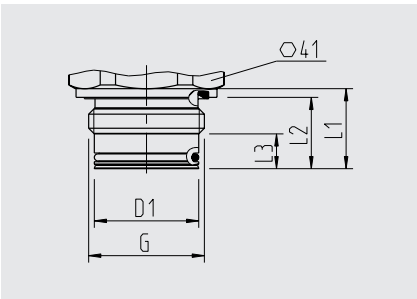


G	L1	L2	D1
¼ NPT female	20 [0.79]	14 [0.55]	Ø 26.5 [1.04]

Process connections model E-11



G	L1	L2	L3	D1
G ½ B	23 [0.90]	20.5 [0.81]	10 [0.39]	Ø 18 [0.71]



G1	L1	L2	L3	D1
G 1 B	23 [0.90]	20,5 [0.81]	10 [0.39]	30 [1.18]

For information on tapped holes and welding sockets, see Technical information IN 00.14 at www.wika.com

Ordering information

Model / Measuring range / Output signal / Electrical connection / Process connection / Sealing

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