

Pressure transmitter with flameproof enclosure

For applications in hazardous areas

Models E-10 and E-11

WIKA data sheet PE 81.27



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

Description

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

These pressure transmitters are available with various analogue signals, from 4 ... 20 mA to battery-powered, low-power versions, e.g DC 1 ... 5 V.

They feature an exceptionally high resistance to vibration, pressure spikes and moisture ingress.

On each individual instrument a comprehensive quality control and calibration is performed, so that an accuracy of $\leq 0.5\%$ 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.



Fig. 1: Model E-10, ATEX, IECEx version

Fig. 2: Model E-11, FM, CSA version with potted cores

Standard
article



Specifications

Accuracy specifications	
Non-linearity per BFSL per IEC 61298-2	≤ 0.2 % of span
Accuracy	→ See “Max. measured error per IEC 61298-2”
Max. measured error per IEC 61298-2	0.5 % of span
Non-repeatability per IEC 61298-2	≤ 0.1 % of span
Mean temperature coefficient at 0 ... 80 °C [32 ... 176 °F]	
Zero point	≤ 0.2 % of span/10 K
Span	≤ 0.2 % of span/10 K
Long-term stability per DIN 16086	≤ 0.2 % of span/year
	For use in hydrogen applications, observe the technical information IN 00.40 at www.wika.com regarding long-term stability.
Reference conditions	Per IEC 61298-1

Measuring ranges, gauge pressure

bar	
Scale range	Overpressure limit
0 ... 0.4	3.1
0 ... 0.6	
0 ... 1	
0 ... 1.6	6.2
0 ... 2.5	
0 ... 4	14
0 ... 6	31
0 ... 10	
0 ... 16	62
0 ... 25	
0 ... 40	
0 ... 60	120
0 ... 100	200
0 ... 160	320
0 ... 250	500
0 ... 400	800
0 ... 600 ^{1) 3)}	1,200
0 ... 1000 ^{2) 3)}	1,500

psi	
Scale range	Overpressure limit
0 ... 5	45
0 ... 10	
0 ... 15	
0 ... 25	89
0 ... 30	
0 ... 60	203
0 ... 100	449
0 ... 160	899
0 ... 200	
0 ... 250	
0 ... 300	1,160
0 ... 500	
0 ... 750	1,740
0 ... 1,000	2,900
0 ... 1,500	
0 ... 2,000	4,600
0 ... 3,000	7,200
0 ... 5,000	11,600
0 ... 8,500 ^{1) 3)}	17,400
0 ... 10,000 ^{2) 3)}	
0 ... 15,000 ^{2) 3)}	21,750

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

2) Measuring range not for model E-11

3) Measuring range not available for oxygen version, oil- and grease-free

Measuring ranges, absolute pressure

bar	
Scale range	Overpressure limit
0 ... 0,	2
0 ... 0.6	4
0 ... 1	5
0 ... 1.6	10
0 ... 2.5	
0 ... 4	17
0 ... 6	35
0 ... 10	
0 ... 16	50

psi	
Scale range	Overpressure limit
0 ... 15	72
0 ... 25	145
0 ... 30	
0 ... 60	240
0 ... 100	500

Vacuum and +/- measuring ranges

bar	
Scale range	Overpressure limit
-1 ... 0	2
-1 ... +0.6	4
-1 ... +1.5	5
-1 ... +3	10
-1 ... +5	17
-1 ... +9	35
-1 ... +15	
-1 ... +25	50

psi	
Scale range	Overpressure limit
-30 inHg ... 0	29
-30 inHg ... 30	145
500-30 inHg ... 60	240
-30 inHg ... 100	500
-30 inHg ... 200	1,160
-30 inHg ... 300	

Further details on: Measuring range

Units	<ul style="list-style-type: none"> ■ bar ■ psi ■ kg/cm² ■ MPa, kPa
Maximum working pressure	→ Corresponds to the upper measuring range value / measuring range full scale value
Overpressure limit	→ See measuring ranges The overpressure limit is based on the measuring range. Depending on the selected process connection and the seal, restrictions in overpressure limit can result.
Vacuum resistance	Yes

Process connection				
Standard	Thread size	Max. measuring range	Overpressure limit	Seal
Process connections for model E-10				
EN 837	G ¼ B	1,000 bar [15,000 psi]	1,480 bar [21,400 psi]	-
	G ¼ female thread	1,000 bar [15,000 psi]	1,480 bar [21,400 psi]	-
	G ½ B	1,000 bar [15,000 psi]	1,480 bar [21,400 psi]	-
DIN EN ISO 1179-2 (formerly DIN 3852-E)	G ¼ A	600 bar [8,700 psi]	858 bar [12,440 psi]	NBR
ANSI/ASME B1.20.1	⅜ NPT	400 bar [5,800 psi]	572 bar [8,290 psi]	-
	¼ NPT	1,000 bar [15,000 psi]	1,480 bar [21,400 psi]	-
	¼ NPT female thread	1,000 bar [15,000 psi]	1,480 bar [21,400 psi]	-
	½ NPT	1,000 bar [15,000 psi]	1,480 bar [21,400 psi]	-
Process connections for model E-11				
-	G ½ B flush (available for measuring ranges 0 ... 2.5 to 0 ... 600 bar)	600 bar [8,700 psi]	600 bar [8,700 psi]	NBR
		400 bar [5,800 psi]	400 bar [5,800 psi]	FPM/FKM
		200 bar [2,900 psi]	200 bar [2,900 psi]	EPDM
-	G ½ B flush (available for measuring ranges 0 ... 4 to 0 ... 1,6 bar)	1.6 bar [20 psi]	10 bar [145 psi]	NBR
		1.6 bar [20 psi]	10 bar [145 psi]	FPM/FKM
		1.6 bar [20 psi]	10 bar [145 psi]	EPDM

Further details on: Process connection	
Possible restrictions	Depending on the choice of seal on the process connection, there may be restrictions in the permissible medium and ambient temperature range.
NBR	-30 ... +100 °C [-22 ... +212 °F]
FPM/FKM	-15 ... +102 °C [5 ... 215 °F] / -15 ... +105 °C [5 ... 221 °F]

Details must be tested separately in the respective application. The specified values for the overpressure limit serve only as a rough orientation. The values depend on the temperature, the seal used, the selected torque, the type and the material of the mating thread and the prevailing operating conditions.

Permissible temperature ranges depend on the option selected above, the EPL, the temperature class, the selected electrical connection and the selected seal. See chapter "Specifications" in the operating instructions.

Output signal	
Signal type	
Current (2-wire)	4 ... 20 mA
Voltage (3-wire)	■ DC 0 ... 5 V
	■ DC 0.5 ... 4.5 V
	■ DC 1 ... 5 V
	■ DC 0 ... 10 V
Load in Ω	
Output signal 4 ... 20 mA	≤ (auxiliary power - 10 V) / 0.02 A
Output signal DC 0 ... 5 V	> maximum output signal / 1 mA
Output signal DC 0.5 ... 4.5 V	> 100k
Output signal DC 1 ... 5 V	> 100k

Output signal		
Output signal DC 0 ... 10 V	> maximum output signal / 1 mA	
Voltage supply		
Auxiliary power	Output signal 4 ... 20 mA	DC 10 ... 30 V
	Output signal DC 0 ... 5 V	DC 10 ... 30 V
	Output signal DC 0.5 ... 4.5 V	DC 5 ... 30 V
	Output signal DC 1 ... 5 V	DC 6 ... 30 V
	Output signal DC 0 ... 10 V	DC 14 ... 30 V
Power consumption	1 W	
Dynamic behaviour		
Settling time per IEC 61298-2	≤ 2 ms	
	≤ 10 ms	For model E-10 with measuring range ≤ 0 ... 25 bar at medium temperature < -30 °C [-22 °F]
		For model E-11

Electrical connection					
Connection type	IP code 1) 2)	Wire cross-section in mm ²	Cable diameter in mm [in]	Cable lengths	Cable material
½ NPT male conduit, with potted cable outlet (ATEX and IECEx approval)	IP67	3 x 0.5 AWG20	6.8 [0.27]	<ul style="list-style-type: none"> ■ 2 m ■ 5 m ■ 10 m 	Polyolefin copolymer
½ NPT male conduit, with cable outlet (FM and CSA approval)	NEMA 4x IP67	3 x 0.56 AWG20	5.4 [0.21]	<ul style="list-style-type: none"> ■ 6 ft ■ 10 m ■ 20 ft ■ 30 ft 	PVC
½ NPT male conduit, with potted cores (FM and CSA approval)	NEMA 4x IP67	3 x 0.5 AWG20	3 x 2.6 [3 x 0.10]	<ul style="list-style-type: none"> ■ 6 ft ■ 10 m ■ 20 ft ■ 30 ft 	Polyolefin

- 1) The stated IP codes only apply when plugged in using mating connectors that have the appropriate IP code.
2) A restricted ambient temperature range of -40 °C ... +80 °C [-40 ... +176 °F] applies for IP code IP67.


Further details on: Electrical connection	
Short-circuit resistance	S ₊ vs. U ₋
Reverse polarity protection	U ₊ vs. U ₋
Insulation voltage	DC 500 V

Pin assignment

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	Grey, shield connected to case	

½ NPT male conduit, with potted cores (FM and CSA approval)

		2-wire	3-wire
	U+	Red	Red
	U-	Black	Black
	S+	-	Brown
		Green, connected to case	

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

		2-wire	3-wire
	U+	Red	Red
	U-	Black	Black
	S+	-	Brown
	Shield	Grey, shield connected to case	

Legend

- U+ Positive power supply terminal
- U- Negative power supply terminal
- S+ Analogue output

Material

Material (wetted)

Model E-11 and E-10 with measuring range ≤ 25 bar	Stainless steel
Model E-10 with measuring range > 25 bar, NACE-compliant	<ul style="list-style-type: none"> ■ Stainless steel ■ Elgiloy®
Seal	→ See "Process connection"

Material (in contact with the environment)

Case	Stainless steel
Cable	→ See "Electrical connection"

Pressure transmission medium

Model E-11 and E-10 with measuring range ≤ 25 bar	Synthetic oil
Model E-10 with measuring range > 25 bar	No pressure transmission medium

Operating conditions			
Permissible temperature ranges ^{1) 2) 3) 4)}			
Instruments per ATEX and IECEx	Medium and ambient temperature limit	T6	-40 ... +60 °C [-40 ... +140 °F]
		T5	-40 ... +75 °C [-40 ... +167 °F]
		T4 ... T1	-40 ... +105 °C [-40 ... +221 °F]
	Storage temperature limit	-40 ... +70 °C [-40 ... +158 °F]	
Instruments per FM, CSA	Medium and ambient temperature limit	T6	-40 ... +60 °C [-40 ... +140 °F]
		T4 ... T1	-40 ... +105 °C [-40 ... +221 °F]
	Storage temperature limit	-40 ... +70 °C [-40 ... +158 °F]	
Vibration resistance per IEC 60068-2-6	10g		
Shock resistance per IEC 60068-2-27	100g (mechanical shock)		
Ingress protection (IP code) per IEC 60529 ⁴⁾	→ See "Electrical connection"		

1) Restricted medium temperature range for oxygen applications: -20 ... +60 °C [-4 ... +140 °F]

2) For restrictions, see "Further details on: Process connection"






3) Restriction for version with protective cap: T4 ... T1, -40 ... +102 °C [-40 ... +215 °F]

4) A restricted ambient temperature range of -40 °C ... +80 °C [-40 ... +176 °F] applies for IP code IP67


Options for specific media			
Oil- and grease-free			
Residual hydrocarbon	< 1,000 mg/m ²		
Packaging	Protective cap on the process connection		
Oxygen, oil- and grease-free			
Measuring ranges	Max. 400 bar [5,000 psi]		
Overpressure limit	2 times		
Residual hydrocarbon	Measuring ranges < 30 bar [435 psi]	< 500 mg/m ²	
	Measuring ranges > 30 bar [435 psi]	< 200 mg/m ²	
Packaging	Protective cap on the process connection		
Max. permissible temperature range	-20 ... +60 °C [-4 ... +140 °F]		
Elastomer seal	Max. -15 ... +60 °C [5 ... 140 °F] and max. 30 bar [435 psi] measuring range → Not possible with process connections with female thread		
Hydrogen	On request		

Packaging and instrument labelling	
Packaging	Individual packaging
Instrument labelling	WIKA product label, glued

Approvals

Logo	Description	Country
	EU declaration of conformity	European Union
	EMC directive EN 61326 emission (group 1, class B) and immunity (industrial environments)	
	Pressure Equipment Directive	
	RoHS directive	
	ATEX directive Flameproof enclosure (Ex d), EN 60079-0, EN 60079-1	International
	IECEX Hazardous areas Flameproof enclosure (Ex d), IEC 60079-0, IEC 60079-1	
	FM Hazardous areas Explosionproof class 3600, class 3615, class 3810	USA
	CSA <ul style="list-style-type: none"> ■ Safety (e.g. electr. safety, overpressure, ...) ■ Hazardous areas Class 2258 02, class 2258 82 	USA and Canada

Optional approvals

Logo	Description	Country
	KCs Hazardous areas	Korea
-	CRN Safety (e.g. electr. safety, overpressure, ...)	Canada

→ For approvals and certificates, see website

Manufacturer's information

Logo	Description
-	China RoHS directive

Safety-related characteristic values

Safety-related characteristic values	
MTTF	> 100 years

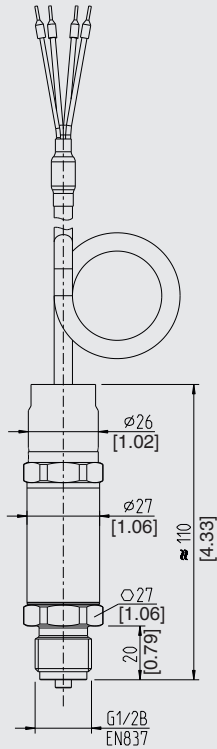
→ For approvals and certificates, see website

Safety-related characteristic values (Ex)

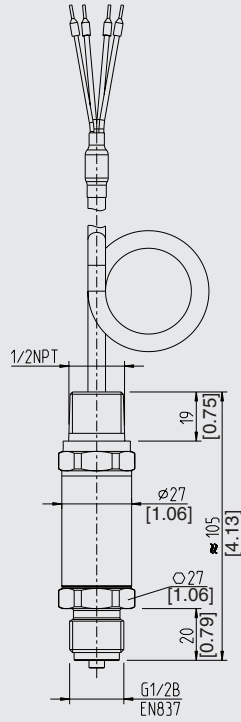
Safety-related characteristic values (Ex)	
Ex marking	
ATEX and IECEx	II 2G Ex db IIC T6...T1 Gb (KEMA 05 ATEX 2240 X) Ex db IIC T6...T1 Gb (IECEx DEK 15.0048X)
FM	Explosionproof for Class I, division 1, groups A, B, C and D Class II, division 1, groups E, F and G Class III, division 1 Type 4
CSA	Explosionproof for 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

Dimensions in mm [in]

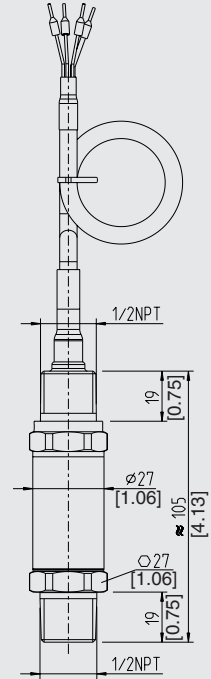
½ NPT male conduit, with potted cable outlet
(ATEX and IECEx approval)
Model E-1*-***-***DX** (without protective cap)



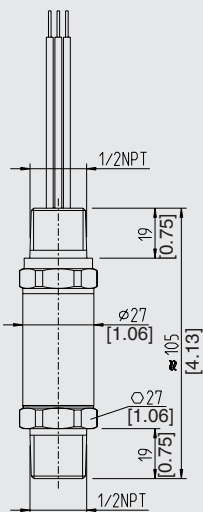
½ NPT male conduit, with potted cable outlet
(ATEX and IECEx approval)
Model E-1*-***-***CX** (without protective cap)



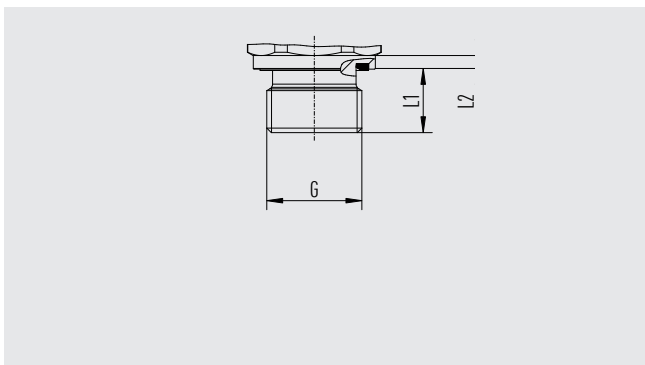
½ NPT male conduit, with cable outlet
(FM and CSA approval)
Model E-1*-***-***2X**



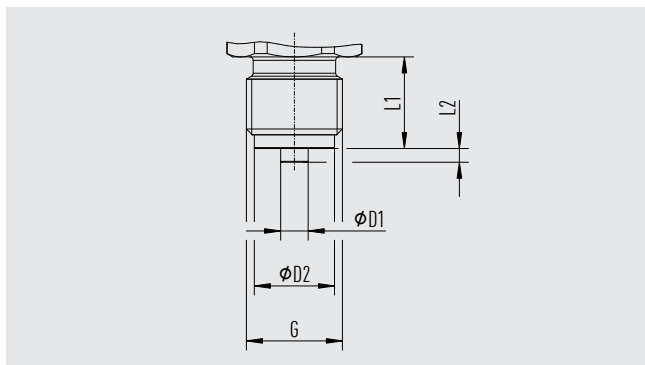
½ NPT male conduit, with potted cores
(FM and CSA approval)
Model E-1*-***-***3X**



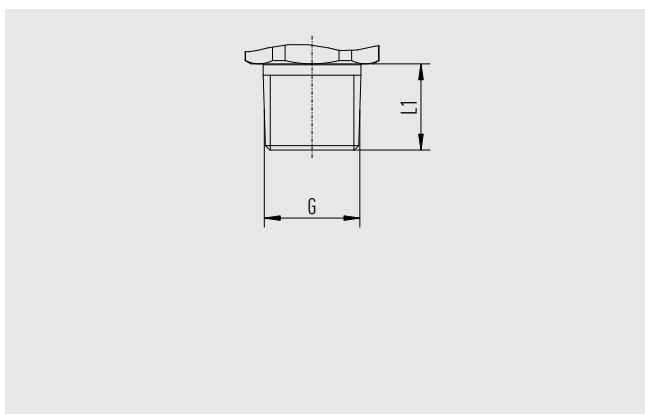
Process connections



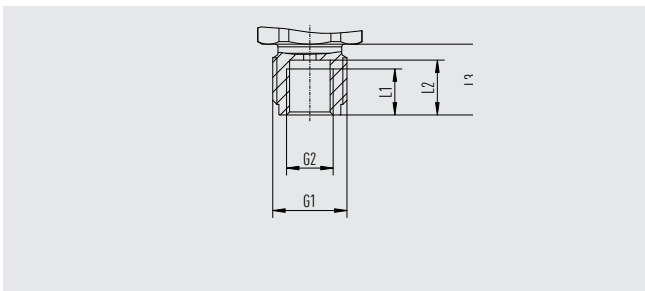
G	L1	L2
G 1/4 A DIN EN ISO 1179-2	12 [0.47]	2 [0.08]



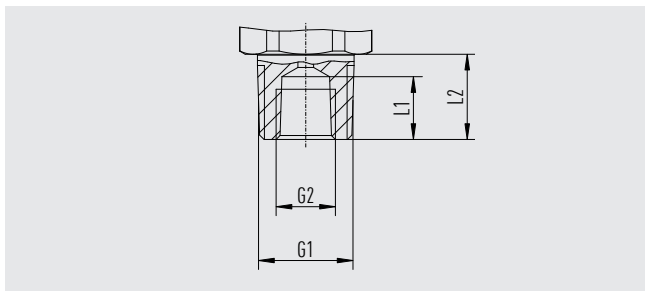
G	L1	L2	D1	D2
G 1/4 B EN 837	13 [0.51]	2 [0.08]	5 [0.19]	9.5 [0.374]
G 1/2 B EN 837	16 [0.63]	3 [0.12]	5.5 [0.22]	13 [0.512]



G	L1
1/8 NPT ANSI/ASME B1.20.1	10 [0.39]
1/4 NPT ANSI/ASME B1.20.1	13 [0.51]
1/2 NPT ANSI/ASME B1.20.1	19 [0.75]

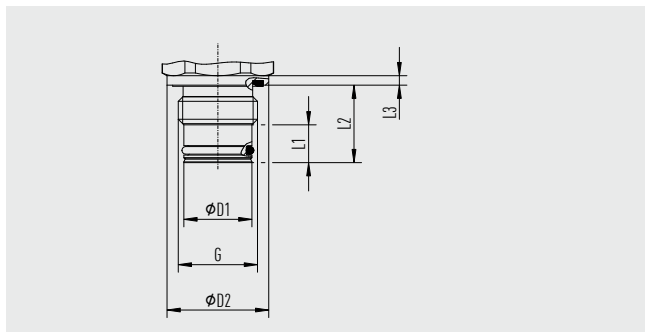


G1	G2	L1	L2	L3
G 1/2 B	G 1/4 female	13 [0.51]	15.5 [0.61]	20 [0.79]



G1	G2	L1	L2
1/2 NPT	1/4 NPT female	14 [0.55]	19 [0.75]

Process connections model E-11



G	L1	L2	L3	D1	D2
G ½ B	10 [0.39]	20.5 [0.807]	3 [0.12]	18 [0.71]	26.9 [1.059]
G 1 B	9 [0.35]	25 [0.98]	2.5 [0.098]	30 [1.18]	40 [1.595]

→ 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 / Seal



© 01/2006 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.
 In case of a different interpretation of the translated and the English data sheet, the English wording shall prevail.

