Pressure transmitter for precision measurements
Model P-30, standard version
Model P-31, flush version

for further approvals
see page 5

CiA201106-301V402/20-0136

Applications

- Measurement and test benches
- Calibration technology
- Laboratories
- Plant construction and machine building

Special features

- Accuracy 0.1 %, without additional temperature error in a range of 10 ... 60 °C
- Optional accuracy of 0.05 % (full scale) available
- Fast measuring rates up to 1 kHz
- Analogue, USB and CANopen® output signals available
- On-site calibration possible using product software

Fig. left: Pressure transmitter model P-30
Fig. right: Pressure transmitter model P-31

Description

Precise

The model P-30 and P-31 pressure transmitters have been developed for precision measurements. Through the use of special WIKA pressure sensors, precision measurements with a maximum measuring deviation of as low as 0.05 % of span are guaranteed. As a result of their active temperature compensation, these pressure transmitters have no additional temperature error in the range of 10 ... 60 ° C.

Fast

The high measuring and output rates of up to 1 kHz make the measured value available as quickly as possible.

Compact

The compact design makes the pressure transmitter ideal for mounting into test benches, such as 19" racks.

Versatile

The models P-30 and P-31 offer a wide selection of electrical connections, process connections and measuring ranges, as well as a large number of different output signals. In addition to the standard analogue signals, USB and CANopen® versions are also available.

Via a USB service interface and the WIKA configuration software "EasyCom", the models P-30 and P-31 can quickly and easily be adjusted on site.

Thanks to the simple-to-use software "Wika data logger“, the USB version can also be used to save measured values and create customised reports.

Measuring ranges

Relative pressure								
bar	**Measuring range**	**0 ... 0.25**	**0 ... 0.4**	**0 ... 0.6**	**0 ... 1**	**0 ... 1.6**	**0 ... 2.5**	**0 ... 4**
	Overpressure limit	1.5	2.4	3.6	4	6.4	7.5	12
	Measuring range	**0 ... 6**	**0 ... 10**	**0 ... 16**	**0 ... 25**	**0 ... 40**	**0 ... 60**	**0 ... 100**
	Overpressure limit	18	30	48	75	80	120	200
	Measuring range	**0 ... 160**	**0 ... 250**	**0 ... 400**	**0 ... 600**	**0 ... 1,000** [1]		
	Overpressure limit	320	500	800	1,200	1,500		
psi	**Measuring range**	**0 ... 5**	**0 ... 10**	**0 ... 15**	**0 ... 25**	**0 ... 30**	**0 ... 50**	**0 ... 100**
	Overpressure limit	20	40	45	75	90	150	300
	Measuring range	**0 ... 160**	**0 ... 200**	**0 ... 300**	**0 ... 500**	**0 ... 1,000**	**0 ... 1,500**	**0 ... 2,000**
	Overpressure limit	480	600	900	1,000	1,500	2,250	3,000
	Measuring range	**0 ... 3,000**	**0 ... 5,000**	**0 ... 10,000**				
	Overpressure limit	4,500	7,500	15,000				

1) not available for model P-31

Absolute pressure								
bar	**Measuring range**	**0 ... 0,25** [2]	**0 ... 0,4**	**0 ... 0,6**	**0 ... 1**	**0,8 ... 1,2** [2]	**0 ... 1,6**	**0 ... 2,5**
	Overpressure limit	1.5	2.4	3.6	4	3.6	4.8	7.5
	Measuring range	**0 ... 4**	**0 ... 6**	**0 ... 10**	**0 ... 16**	**0 ... 25**		
	Overpressure limit	12	18	30	48	48		
psi	**Measuring range**	**0 ... 5**	**0 ... 10**	**0 ... 15**	**0 ... 25**	**0 ... 30**	**0 ... 50**	**0 ... 100**
	Overpressure limit	20	40	45	75	90	150	300
	Measuring range	**0 ... 160**	**0 ... 200**	**0 ... 300**				
	Overpressure limit	480	600	600				

2) only available with an accuracy of 0.1 % of spann

Vacuum and +/- measuring range						
bar	**Measuring range**	**-1 … 0**	**-0.6 … 0**	**-0.4 … 0**	**-0.25 … 0**	**-1 … +0.6**
	Overpressure limit	1.5	1.5	1.5	1.5	3.2
	Measuring range	**-1 … +1**	**-1 … +1.5**	**-1 … +3**	**-1 … +5**	**-1 … +9**
	Overpressure limit	4	5	8	12	20
	Measuring range	**-1 … +15**				
	Overpressure limit	32				
psi	**Measuring range**	**-30 inHg ... 0**	**-30 inHg ... +15**	**-30 inHg ... +30**	**-30 inHg ... +50**	**-30 inHg ... +100**
	Overpressure limit	22.5	60	90	135	240
	Measuring range	**-30 inHg ... +160**	**-30 inHg ... +200**			
	Overpressure limit	360	450			

The given measuring ranges are also available in mbar, kg/cm^2 and MPa.
Other measuring ranges on request

Vacuum resistance
Yes

Output signal

Signal type	Signal
Current (2-wire)	4 ... 20 mA
Current (3-wire)	4 ... 20 mA 0 ... 20 mA
Voltage (3-wire)	DC 0 ... 10 V DC 0 ... 5 V
USB	per P-30/P-31 interface protocol
CANopen®	per CiA DS404

Voltage supply

Power supply
The permissible power supply depends on the corresponding output signal.

- 4 ... 20 mA (2-wire): DC 9 ...30 V
- 4 ... 20 mA (3-wire): DC 9 ...30 V
- 0 ... 20 mA (3-wire): DC 9 ...30 V
- DC 0 ... 5 V: DC 9 ...30 V
- DC 0 ... 10 V: DC 14 ... 30 V
- USB: DC 4,5 ... 5,5 V
- CANopen®: DC 9 ...30 V

Total current consumption
The total current consumption is dependent on the respective signal type.

- Current (2-wire): max. 25 mA
- Current (3-wire): max. 45 mA
- Voltage (3-wire): max. 10 mA
- USB: 40 mA
- CANopen®: 60 mA

Load

- Current (2-wire): ≤ (power supply - 9 V) / 0,02 A
- Current (3-wire): ≤ (power supply - 9 V) / 0,02 A
- Voltage (3-wire): > max. output signal / 1 mA

Accuracy data

Accuracy at reference conditions

Accuracy	
Standard	≤ ±0,1 % of span
Option	≤ ±0,05 % of span [1]

1) For +/- measuring ranges and measuring range ≤ 0.4 bar on request

Including non-linearity, hysteresis, non-repeatability, zero offset and end value deviation (corresponds to measured error per IEC 61298-2). Calibrated in vertical mounting position with process connection facing downwards.

Non-linearity (per IEC 61298-2)
≤ ±0.04 % of span BFSL

Temperature error
In the range of -20 ... +80 °C the instrument is actively compensated.

- -20 ... +10 °C: ≤ ±0,2 % of span/10 K
- 10 ... 60 °C: no additional error [1]
- 60 ... 80 °C: ≤ ±0,2 % of span/10 K

1) For the optional accuracy at reference conditions of ≤ ±0.05 % of span there is an additional temperature error of ≤ ±0.05 % of span.

Total error band (10 ... 60 °C)
≤ ±0.1 % of span

Long-term stability
≤ ±0.1 % of span/year

Adjustability
Adjustment via the "EasyCom 2011" or "EasyCom CANopen®" software

Zero point: -5 ... +10 % of span
Span: -50 ... +5 % of span

Measuring rate
The measuring rate is dependent on the respective signal type.

- 2-wire: 2 ms
- 3-wire 1 ms
- USB 3 ms
- CANopen®: 1 ms

Reference conditions

Temperature
15 ... 25 °C

Atmospheric pressure
860 ... 1,060 mbar

Humidity
45 ... 75 % relative

Power supply
- DC 24 V
- DC 5 V with USB version

Warm-up time
< 10 min

Mounting position
Process connection lower mount (LM)

Operating conditions

Ingress protection (per IEC 60529)
The ingress protection depends on the type of electrical connection.

- Angular connector DIN 175301-803 A: IP 65
- Circular connector M12 x 1 (4-pin): IP 67
- Circular connector M16 x 0.75 (5-pin): IP 67
- Bayonet connector: IP 67
- CANopen® M12 x 1 (5-pin): IP 67
- USB: IP 67
- Cable outlet: IP 67

The stated ingress protection only applies when plugged in using mating connectors that have the appropriate ingress protection.

Vibration resistance
10 g (IEC 60068-2-6, under resonance)

Shock resistance
200 g (IEC 60068-2-27, mechanical)

Service life
10 million load cycles

Free fall test
The instrument is resistant to an impact onto concrete from a height of 1 m.

Temperatures
- Ambient: -20 ... +80 °C
- Medium: -20 ... +105 °C
- Storage: -40 ... +85 °C

Electrical connections

Short-circuit resistance
- S_+ vs. U-
- CAN-High/CAN-Low vs. U_+/U-

Reverse polarity protection
U_+ vs. U-

Overvoltage protection
DC 36 V (not with USB version)

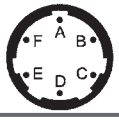
Insulation voltage
DC 500 V

Connection diagrams

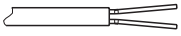
Circular connector M12 x 1 (4-pin)	2-wire	3-wire
		
U_+	1	1
U-	3	3
S_+	-	4

Angular connector DIN 175301-803 A	2-wire	3-wire
		
U_+	1	1
U-	2	2
S_+	-	3

Circular connector M16 x 0.75 (5-pin)	2-wire	3-wire
		
U_+	3	3
U-	1	4
S_+	-	1

Bayonet connector	2-wire	3-wire
		
U_+	A	A
U-	B	B
S_+	-	C

Circular connector M12 x 1 (5-pin), CANopen®	2-wire
	
U_+	2
U-	3
Shield	1
CAN-High	4
CAN-Low	5

Cable outlet unshielded	2-wire	3-wire
		
U_+	brown	brown
U-	blue	blue
S_+	-	black

Cable lengths on request.

Process connections

Model P-30

Standard	Thread size
EN 837	G ¼ B G ¼ female G ½ B
DIN 3852-E	G ¼ A
ANSI/ASME B1.20.1	¼ NPT ½ NPT
-	M18 x 1.5 male with G ¼ female
-	G ½ male with G ¼ female

Other connections on request

Model P-31

Standard	Thread size
EN 837	G ½ B with flush diaphragm G 1 B with flush diaphragm

Sealings

Thread size	Standard	Option
G ¼ B	Without	Cu Stainless steel
G ½ B	Without	Cu Stainless steel
G ¼ A	Without	NBR FPM/FKM

For all other process connections no sealings are available.

Materials

Wetted parts

- Stainless steel
- Additionally Elgiloy® for measuring ranges > 25 bar
- For sealing materials see "Process connections"

Non-wetted parts

Stainless steel

CE conformity

Pressure equipment directive

97/23/EC, PS > 200 bar; module A, pressure accessory

EMC directive

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

RoHS conformity

Yes, instruments with bayonet connector are not RoHS-compliant

Approvals

- **GOST-R,** import certificate, Russia
- **CRN,** safety (e.g. electr. safety, overpressure, ...), Canada

Certificates

- Accuracy test report (included in the delivery)
- 2.2 test report per EN 10204 [1)]
- 3.1 inspection certificate per EN 10204 [1)]

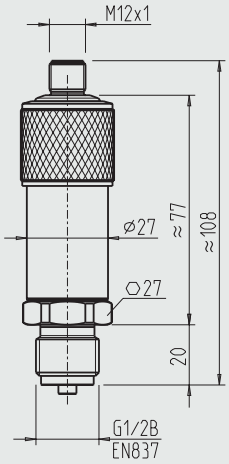
1) option

Approvals and certificates, see website

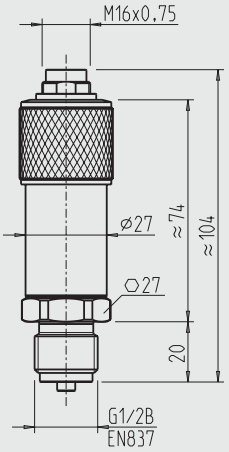
Dimensions in mm

Pressure transmitters

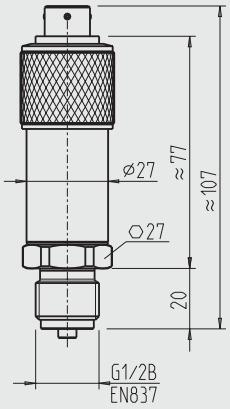
with M12 x 1 circular connector



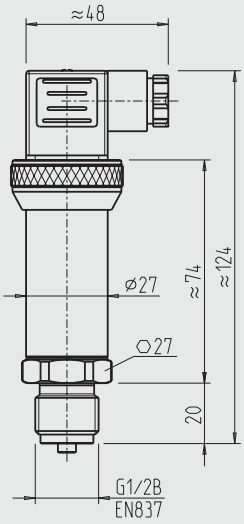
with M16 x 0.75 circular connector



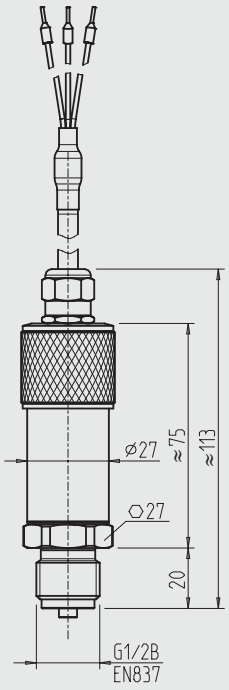
with bayonet connector



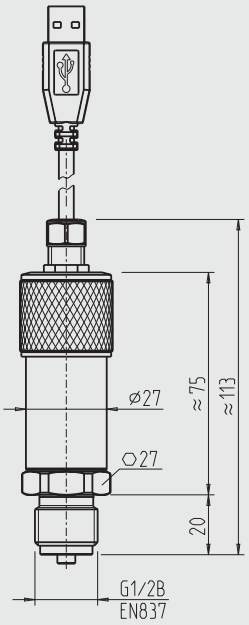
with angular connector
DIN 175301-803 form A



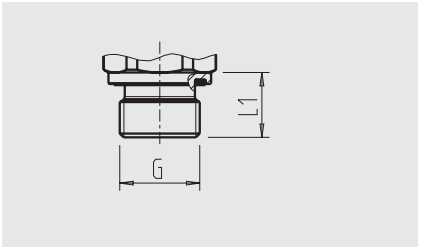
with cable outlet



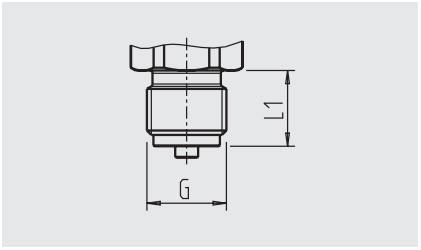
with USB connector type A



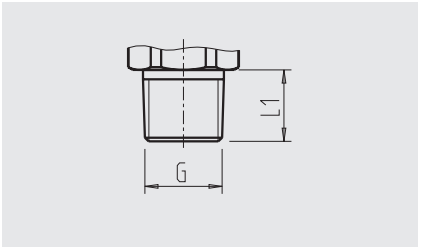
Process connections for model P-30



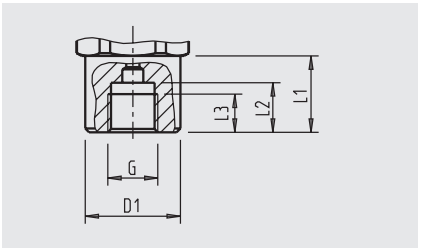
G	L1
G ¼ A DIN 3852-E	12



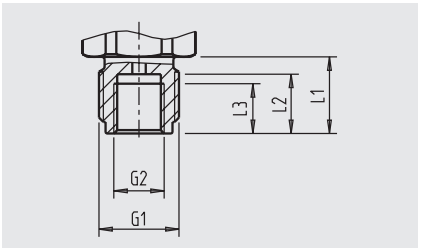
G	L1
G ¼ B EN 837	13
G ½ B EN 837	20



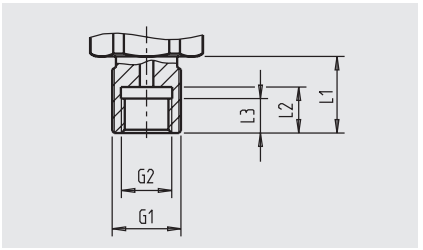
G	L1
¼ NPT	13
½ NPT	19



G	L1	L2	L3	D1
G ¼	20	13	10	Ø 25

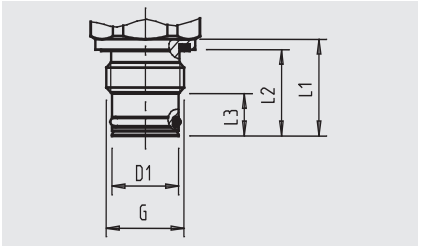


G1	G2	L1	L2	L3
G ½ B	G ¼	20	15,5	13

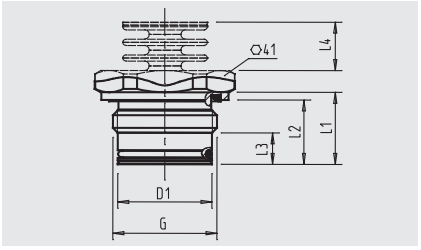


G1	G2	L1	L2	L3
M18 x 1,5	G ¼	20	12	9

Process connections for model P-31



G	L1	L2	L3	D1
G ½ B	23	20,5	10	Ø 18



G1	L1	L2	L3	D1
G 1 B	23	20,5	10	30

Accessories

CANopen® design

Designation	Order no.
Y-connector (M12 x 1 female connector, male/female connector)	2344526
Terminating resistor (120 Ω, M12 x 1 connector)	2308274
Bus cable 0.5 m (M12 x 1 male/female connector)	2308240
Bus cable 2 m (M12 x 1 male/female connector)	2308258
Software EasyCom CANopen®, incl. PCAN-USB adapter, cable set and power supply	7483167
P-30/P-31 software CD	11478901

Analogue design

Designation	Order no.
P-30/P-31 USB service interface, incl. WIKA software CD	13193075

Software

The full software is available to download as freeware from the following path.
www.wika.com / Download / Software / Electronic Pressure Measurement

Ordering information

Model / Measuring range / Output signal / Accuracy at reference conditions / Process connection / Sealing / Electrical connection

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