# 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<br>0 ... 20 mA |
| Voltage (3-wire) | DC 0 ... 10 V<br>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)

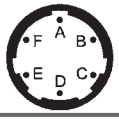
**Insulation voltage**
DC 500 V

**Connection diagrams**

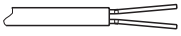
| Circular connector M12 x 1 (4-pin) | 2-wire | 3-wire |
|---|---|---|
|  | | |
| $U_+$ | 1 | 1 |
| U- | 3 | 3 |
| $S_+$ | - | 4 |

| 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<br>G ¼ female<br>G ½ B |
| DIN 3852-E | G ¼ A |
| ANSI/ASME B1.20.1 | ¼ NPT<br>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<br>G 1 B with flush diaphragm |

**Sealings**

| Thread size | Standard | Option |
|---|---|---|
| G ¼ B | Without | Cu<br>Stainless steel |
| G ½ B | Without | Cu<br>Stainless steel |
| G ¼ A | Without | NBR<br>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)]

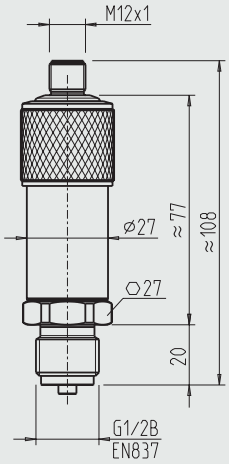
1) option

Approvals and certificates, see website

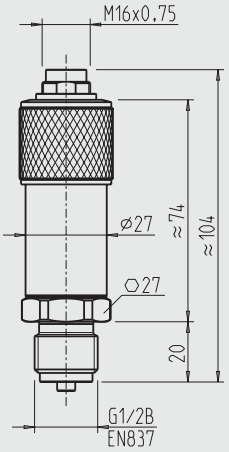
## Dimensions in mm

### Pressure transmitters

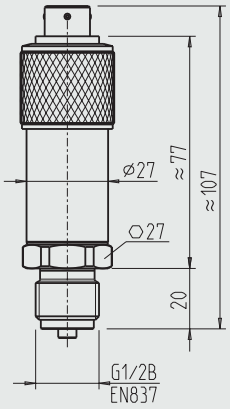
with M12 x 1 circular connector



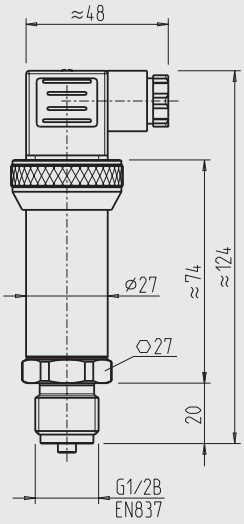

with M16 x 0.75 circular connector



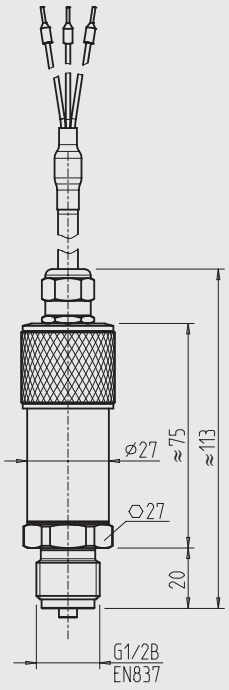

with bayonet connector



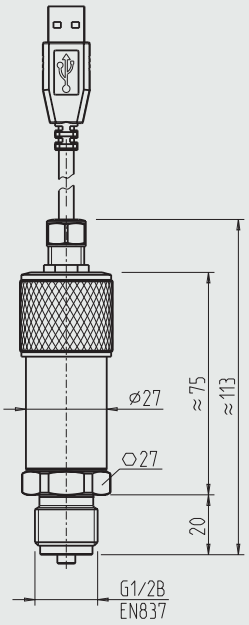

with angular connector
DIN 175301-803 form A



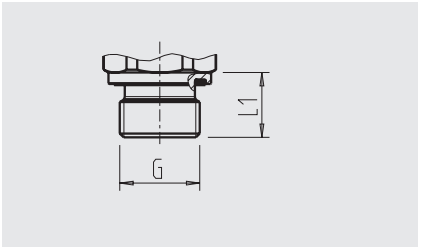

with cable outlet



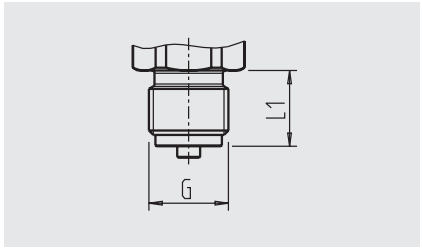

with USB connector type A



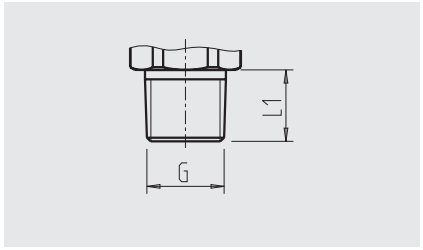
**Process connections for model P-30**



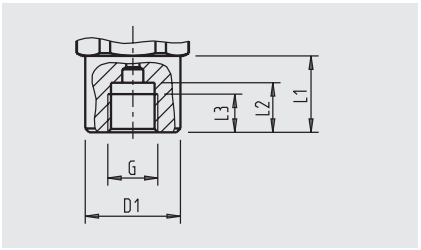

| G | L1 |
|---|---|
| G ¼ A DIN 3852-E | 14 |



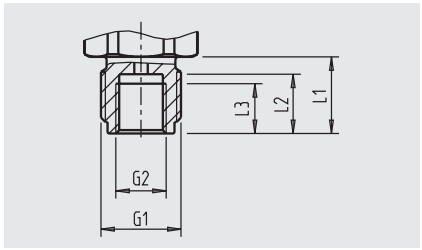

| G | L1 |
|---|---|
| G ¼ B EN 837 | 13 |
| G ½ B EN 837 | 20 |



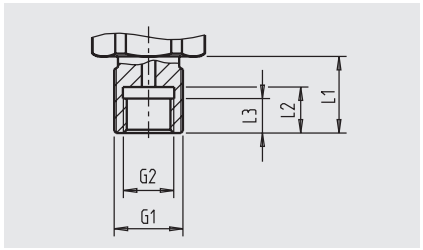

| G | L1 |
|---|---|
| ¼ NPT | 13 |
| ½ NPT | 19 |




| G | L1 | L2 | L3 | D1 |
|---|---|---|---|---|
| G ¼ | 20 | 13 | 10 | Ø 25 |

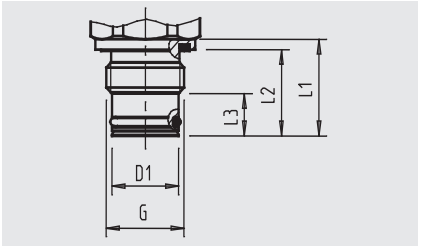



| G1 | G2 | L1 | L2 | L3 |
|---|---|---|---|---|
| G ½ B | G ¼ | 20 | 15,5 | 13 |

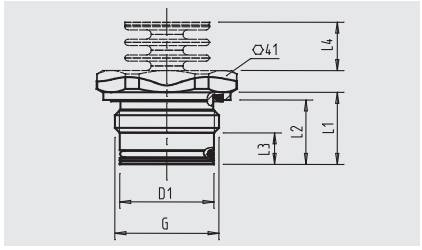



| G1 | G2 | L1 | L2 | L3 |
|---|---|---|---|---|
| M18 x 1,5 | G ¼ | 20 | 12 | 9 |

**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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