

# Pressure transmitter for precision measurements

## Model P-30, standard version

## Model P-31, flush version

WIKA data sheet PE 81.54



for further approvals  
see page 5



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

1) not available for model P-31

Absolute pressure									
<b>bar</b>	<b>Measuring range</b>	<b>0 ... 0.25<sup>2)</sup></b>	<b>0 ... 0.4</b>	<b>0 ... 0.6</b>	<b>0 ... 1</b>	<b>0.8 ... 1.2<sup>2)</sup></b>	<b>0 ... 1.6</b>	<b>0 ... 2.5</b>	
	Overpressure limit	1.5	2.4	3.6	4	3.6	4.8	7.5	
	<b>Measuring range</b>	<b>0 ... 4</b>	<b>0 ... 6</b>	<b>0 ... 10</b>	<b>0 ... 16</b>	<b>0 ... 25</b>			
	Overpressure limit	12	18	30	48	48			
<b>psi</b>	<b>Measuring range</b>	<b>0 ... 5</b>	<b>0 ... 10</b>	<b>0 ... 15</b>	<b>0 ... 25</b>	<b>0 ... 30</b>	<b>0 ... 50</b>	<b>0 ... 100</b>	
	Overpressure limit	20	40	45	75	90	150	300	
	<b>Measuring range</b>	<b>0 ... 160</b>	<b>0 ... 200</b>	<b>0 ... 300</b>					
	Overpressure limit	480	600	600					

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

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

The given measuring ranges are also available in mbar, kg/cm<sup>2</sup> 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):  $\leq (\text{power supply} - 9 \text{ V}) / 0,02 \text{ A}$
- Current (3-wire):  $\leq (\text{power supply} - 9 \text{ V}) / 0,02 \text{ A}$
- Voltage (3-wire):  $> \text{max. output signal} / 1 \text{ mA}$

## Accuracy data

### Accuracy at reference conditions

Accuracy	
Standard	$\leq \pm 0,1 \%$ of span
Option	$\leq \pm 0,05 \%$ of span <sup>1)</sup>

1) For +/- measuring ranges and measuring range  $\leq 0.4$  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)

$\leq \pm 0.04 \%$  of span BFSL

### Temperature error

In the range of  $-20 \dots +80 \text{ }^\circ\text{C}$  the instrument is actively compensated.

- $-20 \dots +10 \text{ }^\circ\text{C}$ :  $\leq \pm 0,2 \%$  of span/10 K
- $10 \dots 60 \text{ }^\circ\text{C}$ : no additional error <sup>1)</sup>
- $60 \dots 80 \text{ }^\circ\text{C}$ :  $\leq \pm 0,2 \%$  of span/10 K

1) For the optional accuracy at reference conditions of  $\leq \pm 0.05 \%$  of span there is an additional temperature error of  $\leq \pm 0.05 \%$  of span.

### Total error band (10 ... 60 °C)

$\leq \pm 0.1 \%$  of span

### Long-term stability

$\leq \pm 0.1 \%$  of span/year

### Adjustability

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

Zero point:  $-5 \dots +10 \%$  of span

Span:  $-50 \dots +5 \%$  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<sub>+</sub> vs. U<sub>-</sub>
- CAN-High/CAN-Low vs. U<sub>+</sub>/U<sub>-</sub>

### Reverse polarity protection

U<sub>+</sub> vs. U<sub>-</sub>

### Overvoltage protection

DC 36 V (not with USB version)

### Insulation voltage

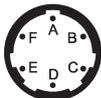
DC 500 V

### Connection diagrams

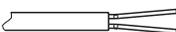
Circular connector M12 x 1 (4-pin)		
	2-wire	3-wire
	U <sub>+</sub> 1	1
	U <sub>-</sub> 3	3
	S <sub>+</sub> -	4

Angular connector DIN 175301-803 A		
	2-wire	3-wire
	U <sub>+</sub> 1	1
	U <sub>-</sub> 2	2
	S <sub>+</sub> -	3

Circular connector M16 x 0.75 (5-pin)		
	2-wire	3-wire
	U <sub>+</sub> 3	3
	U <sub>-</sub> 1	4
	S <sub>+</sub> -	1

Bayonet connector		
	2-wire	3-wire
	U <sub>+</sub> A	A
	U <sub>-</sub> B	B
	S <sub>+</sub> -	C

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

Cable outlet unshielded		
	2-wire	3-wire
	U <sub>+</sub> brown	brown
	U <sub>-</sub> blue	blue
	S <sub>+</sub> -	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)

## 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 <sup>1)</sup>
- 3.1 inspection certificate per EN 10204 <sup>1)</sup>

<sup>1)</sup> option

Approvals and certificates, see website

## Manufacturer's declaration

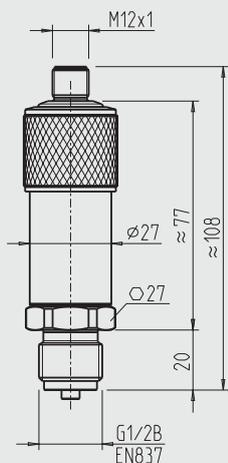
### RoHS conformity

Yes, instruments with bayonet connector are not RoHS-compliant

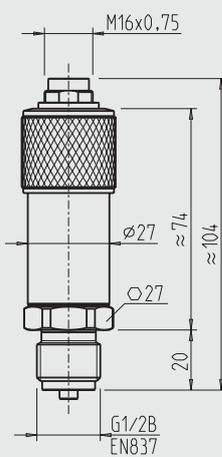
## Dimensions in mm

### Pressure transmitters

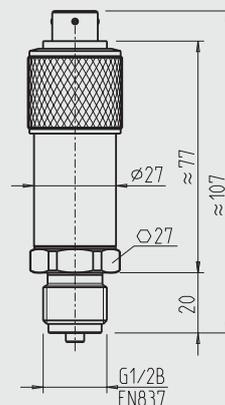
with M12 x 1 circular connector



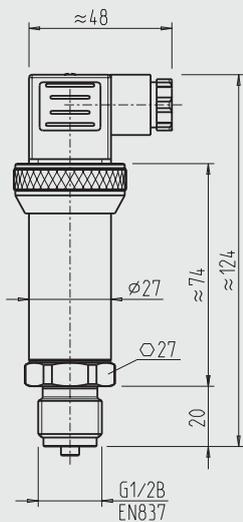
with M16 x 0.75 circular connector



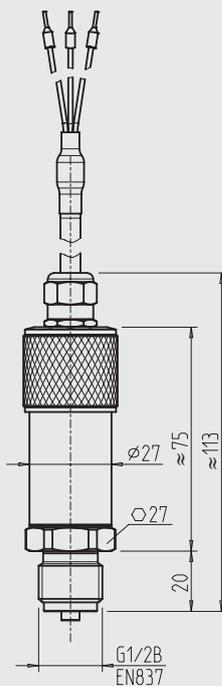
with bayonet connector



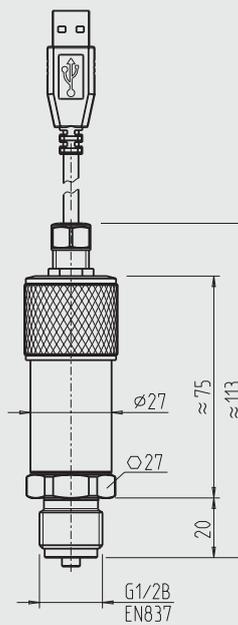
with angular connector  
DIN 175301-803 form A



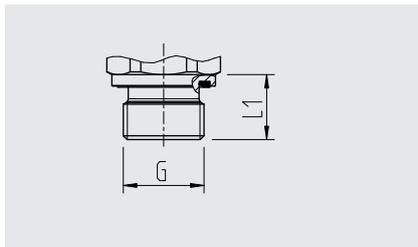
with cable outlet



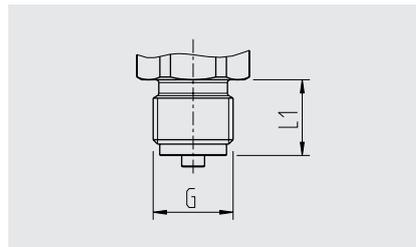
with USB connector type A



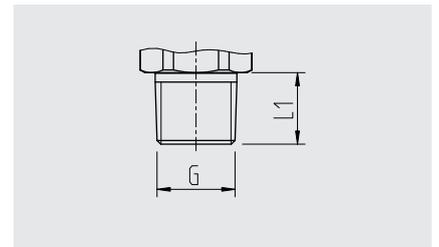
## Process connections for model P-30



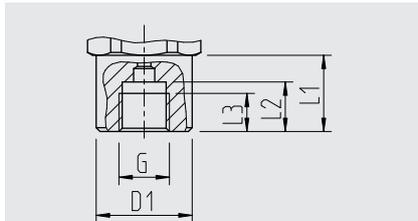
G	L1
G 1/4 A DIN 3852-E	12



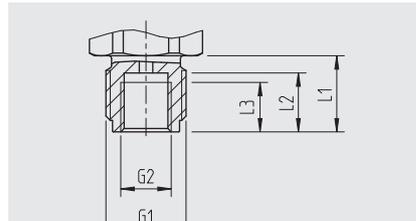
G	L1
G 1/4 B EN 837	13
G 1/2 B EN 837	20



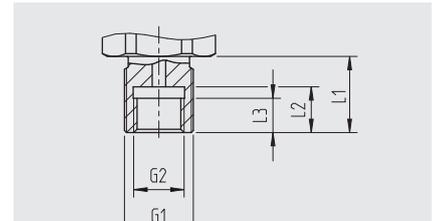
G	L1
1/4 NPT	13
1/2 NPT	19



G	L1	L2	L3	D1
G 1/4	20	13	10	Ø 25

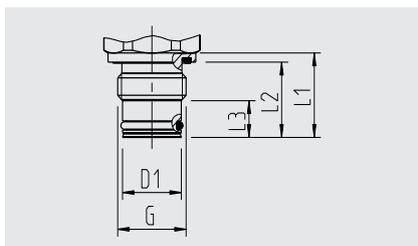


G1	G2	L1	L2	L3
G 1/2 B	G 1/4	20	15,5	13

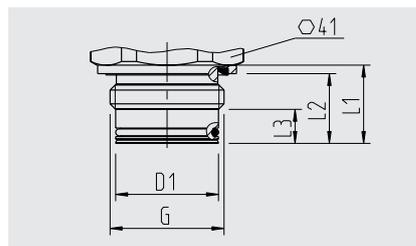


G1	G2	L1	L2	L3
M18 x 1,5	G 1/4	20	12	9

## Process connections for model P-31



G	L1	L2	L3	D1
G 1/2 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](http://www.wika.com/Download/Software/Electronic%20Pressure%20Measurement)

## Ordering information

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

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