

# Pressure transmitter for precision measurements

## Model P-30, standard version

## Model P-31, flush diaphragm

WIKA data sheet PE 81.54



CIA201106-301V402/20-0136

### Applications

- 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
- USB and CANopen output signals available
- On-site calibration possible using product software

### Description

#### Highest precision

By using specialised WIKA pressure sensors, precision measurements with a maximum measuring deviation of 0.05% FS are guaranteed. As confirmation, each instrument comes with a free test report as standard. If required, a 3.1 acceptance test certificate or a DKD certificate can be provided.

#### Highest variety

The P-3x offers a very large number of electrical connections, process connections and measuring ranges. This high variety is enhanced by the availability of a wide range of output signals, including USB and CANopen.

### Pressure transmitter model P-30



#### Highest performance

A microcontroller with one of the most advanced digital signal processing and the internal temperature measurement enable high sampling rates and active temperature compensation within these measuring instruments. In the temperature range from 10 ... 60 °C, the P-3x exhibits no additional temperature error.

In addition, measurement and output rates of up to 1 kHz put the finishing touch on the top performance of the P-30.

#### Highest service

Via an internal USB service interface (for analogue instruments) and optional configuration software, the P-3x can be calibrated quickly and easily, providing a user-friendly adjustment of the zero point on site. In addition, for the CANopen and USB versions, various software tools are available (e.g. data logger software). Thanks to the detailed technical documentation (e.g., interface protocol, DLL) it is possible for the customer to use software specifically adapted to their application.

## Measuring ranges

Relative pressure								
<b>bar</b>	0 ... 0.25	0 ... 0.4	0 ... 0.6	0 ... 1	0 ... 1.6	0 ... 2.5	0 ... 4	0 ... 6
	0 ... 10	0 ... 16	0 ... 25	0 ... 40	0 ... 60	0 ... 100	0 ... 160	0 ... 250
	0 ... 400	0 ... 600	0 ... 1000					
<b>psi</b>	0 ... 5	0 ... 10	0 ... 15	0 ... 25	0 ... 30	0 ... 50	0 ... 60	0 ... 100
	0 ... 160	0 ... 200	0 ... 250	0 ... 300	0 ... 400	0 ... 500	0 ... 600	0 ... 750
	0 ... 800	0 ... 1000 <sup>1)</sup>	0 ... 1500	0 ... 2000	0 ... 3000	0 ... 5000	0 ... 10000	

Absolute pressure								
<b>bar</b>	0 ... 0.25	0 ... 0.4	0 ... 0.6	0 ... 1	0 ... 1.6	0 ... 2.5	0 ... 4	0 ... 6
	0 ... 10							
<b>psi</b>	0 ... 5	0 ... 10	0 ... 15	0 ... 25	0 ... 30	0 ... 50	0 ... 60	0 ... 100
	0 ... 160	0 ... 200						

Vacuum and +/- measuring range							
<b>bar</b>	-1 ... 0	-1 ... 0.6	-1 ... 1.5	-1 ... 3	-1 ... 5	-1 ... 9	-1 ... 15
<b>psi</b>	-30 inHG ... 0	-30 inHG ... 15	-30 inHG ... 30	-30 inHG ... 60	-30 inHG ... 100	-30 inHG ... 160	-30 inHG ... 200

1) Applies only to P-30

The given measuring ranges are also available in kg/cm<sup>2</sup>, MPa and kPa.  
Other measuring ranges available on request

### Overpressure safety

- 3 times: up to 16 bar
- 2 times: from 16 bar
- 1.5 times: 0 ... 1000 psi, 0 ... 1500 psi, 0 ... 10000 psi

Vacuum resistance: yes

## Output signal

Signal type	Value
<b>Current (2-wire)</b>	4 ... 20 mA
<b>Current (3-wire)</b>	4 ... 20 mA 0 ... 20 mA
<b>Voltage (3-wire)</b>	DC 0 ... 10 V DC 0 ... 5 V DC 1 ... 5 V DC 0.5 ... 4.5 V
<b>USB</b>	-
<b>CANopen</b>	-

### Load in Ω

Current (2-wire):  $\leq (\text{supply voltage} - 9 \text{ V}) / 0.02 \text{ A}$   
 Current (3-wire):  $\leq (\text{supply voltage} - 9 \text{ V}) / 0.02 \text{ A}$   
 Voltage (3-wire):  $> U_{\text{max}} / 1 \text{ mA}$

## Power supply

### Supply voltage

DC 9 ... 30 V  
 DC 14 ... 30 V (for voltage output DC 0 ... 10 V)

### Measuring rate

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

### Total current consumption

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

## Accuracy

### Non-linearity (IEC 61298-2)

≤ ± 0.04 % of span BFSL

### Accuracy at room temperature

Accuracy class	
Standard	≤ ± 0.1 % of span <sup>1)</sup>
Option	≤ ± 0.05 % of span <sup>1) 2)</sup>

1) Including non-linearity, hysteresis, zero-point and full scale deviations (corresponds to measured error per IEC 61298-2). Calibrated in vertical mounting position with process connection facing downwards.

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

### Temperature error

-20 ... +10 °C: ≤ ± 0.2 % / 10 K

10 ... 60 °C: no additional error (actively compensated)

60 ... 80 °C: ≤ ± 0.2 % / 10 K

### Long-term drift per year

≤ ± 0.1% of span

### Total error band (10 ... 60 °C)

≤ ± 0.1% of span

### Adjustment and recalibration

Calibration via software "EasyCom 2011"

„EasyCom CANopen®“

Zero point: -5 ... +20 % of span

Span: -5 ... +20 % of span

## Reference conditions

Temperature:	15 ... 25 °C
Atmospheric pressure:	950 ... 1050 mbar
Humidity:	45 ... 75 % relative
Nominal position:	Process connection lower mount (LM)
Supply voltage:	DC 24 V
Load:	see output signals
Warm-up time:	< 10 min
Mounting position:	as required

## Operating conditions

### Mechanics

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: 1 m

### Temperatures

Compensated temperature range: -20 ... +80 °C

Medium: -20 ... +105 °C

Ambient: -20 ... +80 °C

Storage: -40 ... +85 °C

## Process connections

### Model P-30

Standard	Thread
EN 837	G 1/4 B G 1/4 female G 1/2 B
DIN 3852-E 2)	G 1/4 A
ANSI/ASME B1.20.1	1/4 NPT 1/4 NPT female 1/2 NPT
-	M18 x 1.5 male with G 1/4 female
-	G 1/2 male with G 1/4 female

Other connections available on request

### Model P-31

Standard	Thread
EN 837	G 1/2 B with flush diaphragm G 1 B with flush diaphragm

### Sealings (model P-31)

EN 837	
Standard	NBR, FPM, FKM
Option	EPDM

The sealings listed under "Standard" are included in the delivery.

## Electrical connections

### Specifications

Description	Ingress protection
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 (per IEC 60529) only applies when plugged in using mating connectors that have the appropriate ingress protection.

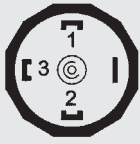
Various cable lengths on request.

### Electrical safety

Short-circuit resistance:	S+ vs. 0V CAN-High / CAN-Low vs. U+ / 0V
Reverse polarity protection:	U+ vs. 0V
Overvoltage protection:	DC 36 V
Insulation voltage:	DC 500 V

## Connection diagram

### Angular connector DIN 175301-803 A



#### Assignment

	U+	0V	S+
2-wire	1	2	-
3-wire	1	2	3

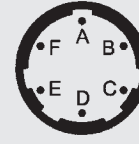
### Circular connector M12 x 1 (4-pin)



#### Assignment

	U+	0V	S+
2-wire	1	3	-
3-wire	1	3	4

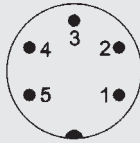
### Bayonet connector



#### Assignment

	U+	0V	S+
2-wire	A	B	-
3-wire	A	B	C

### Circular connector M16 x 0.75 (5-pin)



#### Assignment

	U+	0V	S+
2-wire	3	1	-
3-wire	3	4	1

### CANopen M12 x 1 (5-pin)



#### Assignment

	U <sub>B+</sub>	U <sub>B-</sub>	Shield	CAN-High	CAN-Low
2	3	1	4	5	

### Cable outlet unshielded



#### Assignment

	U+	0V	S+
2-wire	brown	blue	-
3-wire	brown	blue	black

## Materials

### Wetted parts

Stainless steel (additionally Elgiloy® for measuring ranges > 25 bar)

For sealing materials see "Process connections"

### Non-wetted parts

Stainless steel

## Approvals, directives and certificates

### CE conformity

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

Pressure equipment directive: 97/23/EC

For measuring ranges > 200 bar the following applies:

Module A, pressure accessory

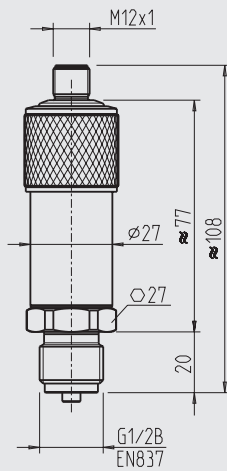
ROHS conformity: Yes <sup>1)</sup>

1) Not with bayonet connector

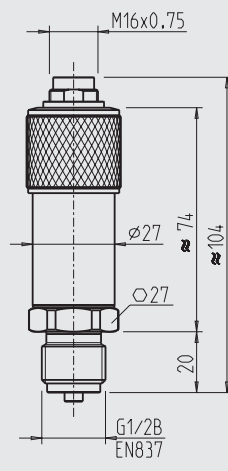
# Dimensions in mm

## Pressure transmitter

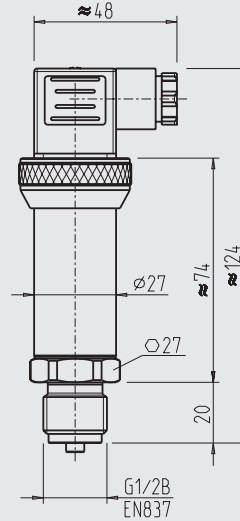
with M12 x 1 circular connector



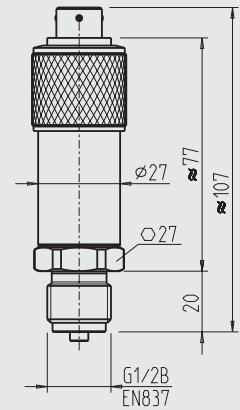
with M16 x 0.75 circular connector



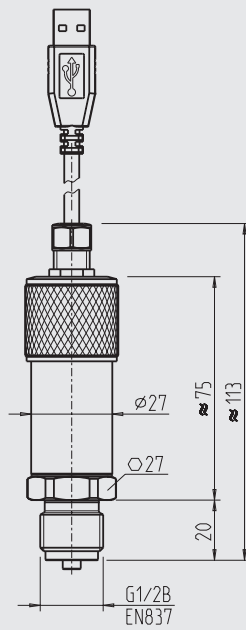
with angular connector form A



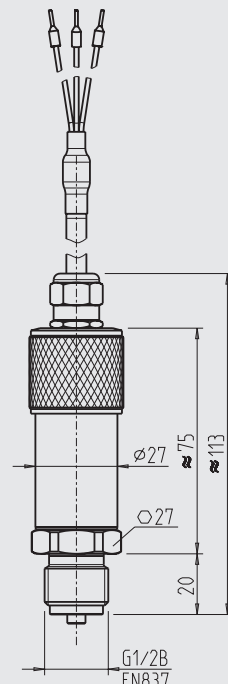
with bayonet connector



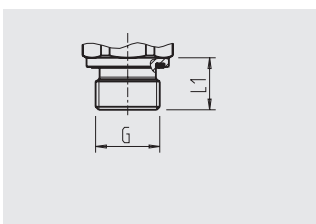
with USB



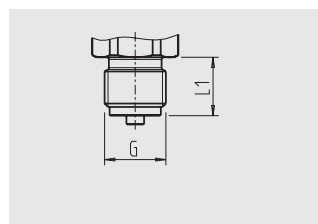
with cable outlet



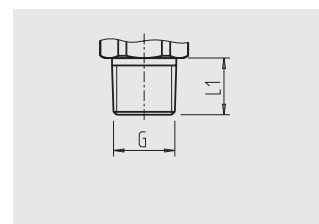
## Process connections



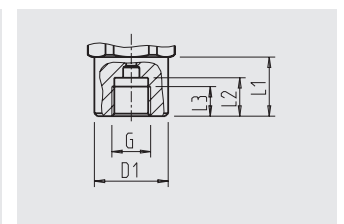
G	L1
G 1/4 A DIN 3852-E	12
G 1/2 A DIN 3852-E	14
M14 x 1.5	12



G	L1
G 1/4 B EN 837	13

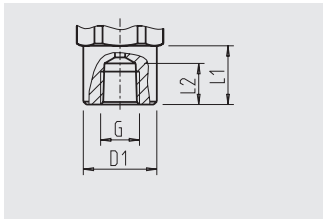


G	L1
1/4 NPT	13
1/2 NPT	19

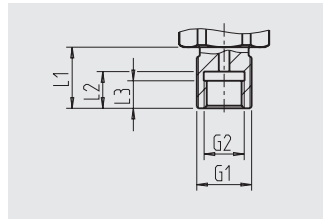


G	L1	L2	L3	D1
G 1/4 EN 837	20	13	10	Ø 25

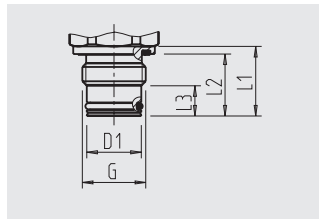
## Process connections



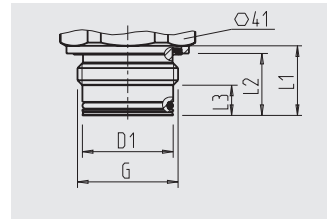
G	L1	L2	D1
1/4 NPT	20	14	Ø 25



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



G	L1	L2	L3	D1
G 1/2 B	23	20.5	9	Ø 18



G	L1	L2	L3	D1
G 1 B	23	20.5	10	Ø 30

## Accessories

### CANopen design

Description	Order number
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

### Analogue design

Description	Order number
USB adapter cable, incl. P-30 software CD	13193075

### Software

The full software is available to download as freeware from the following path.  
[www.wika.de / Download / Software / Electronic Pressure Measurement](http://www.wika.de/Download/Software/Electronic%20Pressure%20Measurement)

## Ordering information

Model / Measuring range / Output signal / Accuracy at room temperature / Process connection / Sealing / Electrical connection

© 2011 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.



**WIKAI Alexander Wiegand SE & Co. KG**  
 Alexander-Wiegand-Straße 30  
 63911 Klingenberg/Germany  
 Tel. (+49) 9372/132-0  
 Fax (+49) 9372/132-406  
 E-mail [info@wika.de](mailto:info@wika.de)  
[www.wika.de](http://www.wika.de)