

# Electronic pressure switch with display Model PSD-4

WIKA data sheet PE 81.86



## Applications

- Machine tools
- Hydraulics and pneumatics
- Pumps and compressors
- Special-purpose machine building

## Special features

- Easily readable, robust digital display
- Intuitive and fast setup
- Easy and flexible mounting configurations
- Flexibly configurable and scalable output signals



Electronic pressure switch, model PSD-4

## Description

### Leading in design and functionality

The model PSD-4 pressure switch represents the extensive further development of the PSD-30 pressure switch, itself already awarded with the “iF product design award” for its outstanding functionality. A high accuracy of 0.5 %, freely configurable output signals (PNP/NPN, 4 ... 20 mA/0 ... 10 V), the 5:1 scalability of the analogue output, in addition to outstanding self-diagnostics, make the PSD-4 an excellent automation solution.

### Customised installation

The installation of the PSD-4 can be flexibly adapted to the individual mounting situation. Due to the almost unlimited rotation of the digital display and case by more than 300°, the digital display can be adjusted independently of the electrical connection. The digital display can thus always be aligned to face the operator, and the M12 x 1 connection positioned to suit the desired cable routing.

### High quality

During development of the WIKA switch family a high value was placed on a robust design and the selection of appropriate materials suited to machine-building applications. For this reason the case and the threaded connection of the electrical connector are made from stainless steel. Overwinding or tearing off the connector is therefore virtually impossible.

### IO-Link 1.1

With the optional output signal in accordance with the IO-Link communication standard, the PSD-4 allows a fast integration into modern automation systems. IO-Link offers simpler and faster installation, parameterisation and higher functionality for the PSD-4.

## Measuring ranges

Gauge pressure								
bar	0 ... 0.4 <sup>1)</sup>	0 ... 0.6 <sup>1)</sup>	0 ... 1 <sup>1)</sup>	0 ... 1.6 <sup>1)</sup>	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 ... 1,000						
psi	0 ... 10 <sup>1)</sup>	0 ... 15 <sup>1)</sup>	0 ... 25 <sup>1)</sup>	0 ... 30 <sup>1)</sup>	0 ... 50	0 ... 100	0 ... 160	0 ... 200
	0 ... 300	0 ... 500	0 ... 1,000	0 ... 1,500	0 ... 2,000	0 ... 3,000	0 ... 5,000	0 ... 7,500

Absolute pressure								
bar	0 ... 0.4 <sup>1)</sup>	0 ... 0.6 <sup>1)</sup>	0 ... 1 <sup>1)</sup>	0 ... 1.6 <sup>1)</sup>	0 ... 2.5	0 ... 4	0 ... 6	0 ... 10
	0 ... 16	0 ... 25						
psi	0 ... 10 <sup>1)</sup>	0 ... 15 <sup>1)</sup>	0 ... 25 <sup>1)</sup>	0 ... 30 <sup>1)</sup>	0 ... 50	0 ... 100	0 ... 160	0 ... 200
	0 ... 300							

Vacuum and +/- measuring range								
bar	-1 ... 0 <sup>1)</sup>	-1 ... +0.6 <sup>1)</sup>	-1 ... +1.5	-1 ... +3	-1 ... +5	-1 ... +9	-1 ... +15	-1 ... +24
psi	-14.5 ... 0 <sup>1)</sup>	-14.5 ... +15 <sup>1)</sup>	-14.5 ... +30	-14.5 ... +50	-14.5 ... +100	-14.5 ... +160	-14.5 ... +200	-14.5 ... +300

1) Not available for G ½ flush process connection

The stated measuring ranges are also available in kg/cm<sup>2</sup> and MPa.

Special measuring ranges between 0 ... 0.4 and 0 ... 1,000 bar (0 ... 10 bis 0 ... 7,500 psi) are available on request.

Special measuring ranges have a reduced long-term stability and increased temperature errors.

### Overload safety

The overload safety is based on the sensor element used. Dependent on the selected process connection and the sealing, restrictions in overload safety can result.

≤ 600 bar (< 8,000 psi): 2 times

> 1,000 bar (≥ 8,000 psi): 1.5 times

### Increased overload safety (option)

With increased overload safety there are deviations in temperature error, signal noise and long-term stability.

### Vacuum-tight

Yes

## Digital display

14-segment LED, red, 4-digit, 9 mm (0.35 in) character size

Display can be turned electronically by 180°

## Output signals

Switching output		Analogue signal
SP1	SP2	
PNP/NPN	-	4 ... 20 mA (3-wire)
PNP/NPN	-	DC 0 ... 10 V (3-wire)
PNP/NPN	-	4 ... 20 mA / DC 0 ... 10 V (3-wire)
PNP/NPN	PNP/NPN	-
PNP/NPN	PNP/NPN	4 ... 20 mA (3-wire)
PNP/NPN	PNP/NPN	DC 0 ... 10 V (3-wire)
PNP/NPN	PNP/NPN	4 ... 20 mA / DC 0 ... 10 V (3-wire)

The switching outputs are configurable as PNP or NPN switches. The ability to switch between 4 ... 20 mA / DC 0 ... 10 V can be ordered as an option.

### IO-Link, version 1.1 (option)

IO-Link is optionally available for all output signals.

### Zero offset adjustment

max. 3 % of span

### Damping of analogue output/switching outputs

configurable from 0 ms ... 65 s

### Switch-on time

1 s

### Switching thresholds

Switch point 1 and switch point 2 are individually adjustable

### Switching functions

Normally open, normally closed, window, hysteresis  
Freely adjustable

### Switching voltage

Power supply - 1 V

### Switching current

max. 250 mA

### Settling time/response time

Analogue signal:  $\leq 5$  ms

Switching output:  $\leq 5$  ms

### Load

Analogue signal 4 ... 20 mA:  $\leq 500 \Omega$

Analogue signal DC 0 ... 10 V:  $>$  max. output voltage / 1 mA

### Service life

100 million switching cycles

## Voltage supply

### Power supply

DC 15 ... 35 V

### Current consumption

max. 45 mA for versions without 4 ... 20 mA output signal  
max. 70 mA for versions with 4 ... 20 mA output signal

### Total current consumption

max. 600 mA including switching current

## Accuracy specifications

### Accuracy, analogue signal

$\leq \pm 0.5$  % of span

Including non-linearity, hysteresis, zero offset and end value deviation (corresponds to measured error per IEC 61298-2).

#### ■ Non-repeatability:

$\leq 0.1$  % of span (IEC 61298-2)

#### ■ Long-term drift:

$\leq \pm 0.1$  % of span (IEC 61298-2)

$\leq \pm 0.2$  % of span (IEC 61298-2) for measuring ranges

$\leq 0.6$  bar / 10 psi, flush process connection, increased overload safety

### Turndown

The analogue output signal is freely scalable within the range of 5:1

When setting turndown, there is a proportional increase in the measuring deviation and temperature error.

### Accuracy, switching output

$\leq \pm 0.5$  % of span

### Temperature error in rated temperature range

maximum:  $\leq \pm 1.5$  % of span

maximum:  $\leq \pm 2.5$  % of span for increased overload safety and flush versions

### Temperature coefficients in rated temperature range

Mean TC zero point:  $\leq \pm 0.16$  % of span/10 K

Mean TC span:  $\leq \pm 0.16$  % of span/10 K

## Reference conditions (per IEC 61298-1)

Temperature: 15 ... 25 °C (59 ... 77 °F)

Atmospheric pressure: 860 ... 1,060 mbar (12.5 ... 15.4 psi)

Humidity: 45 ... 75 % r. h.

Nominal position: Process connection lower mount

Power supply: DC 24 V

Load: see output signals

## Operating conditions

### Permissible temperature ranges

Medium: -20 ... +85 °C (-4 ... +185 °F)  
Ambient: -20 ... +80 °C (-4 ... +176 °F)  
Storage: -20 ... +70 °C (-4 ... +158 °F)  
Nominal temperature: 0 ... 80 °C (32 ... 176 °F)

### Humidity

45 ... 75 % r. h.

### Vibration resistance

20 g, 10 ... 2,000 Hz (IEC 60068-2-6, under resonance)

### Shock resistance

50 g, 6 ms (IEC 60068-2-27, mechanical)

### Service life, mechanics

100 million load cycles (10 million load cycles for measuring ranges > 600 bar/7,500 psi)

### Ingress protection

IP65 and IP67

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

### Mounting position

as required

## Materials

### Wetted parts

< 10 bar (150 psi): 316L  
≥ 10 bar (150 psi): 316L, PH grade steel

### Non-wetted parts

Case: 304  
Keyboard: TPE-E  
Display window: PC  
Display head: PC+ABS blend

Pressure transmission medium:

Synthetic oil for all gauge pressure measuring ranges < 10 bar (150 psi) <sup>1)</sup>, all absolute pressure measuring ranges and flush versions.

1) < 16 bar (250 psi) with increased overload safety

### Options for specific media

- Oil and grease free: Residual hydrocarbon: < 1,000 mg/m<sup>2</sup>
- Oxygen, oil and grease free:  
Residual hydrocarbon: < 200 mg/m<sup>2</sup>  
Packaging: Protection cap on the process connection  
Max. permissible temperature -20 ... +60 °C (-4 ... +140 °F)  
Available measuring ranges:  
0 ... 10 to 0 ... 1,000 bar (0 ... 150 to 0 ... 7,500 psi)  
-1 ... 9 to -1 ... 24 bar (-14.5 ... 160 to -14.5 ... 300 psi)  
Factory supplied without sealing  
Available process connections, see "Process connections"

## Process connections

Standard	Thread size	Overload limit	Sealing
DIN 3852-E	G ¼ A	1,000 bar (14,500 psi)	NBR (options: Without, FPM/FKM)
	G ½ A	1,000 bar (14,500 psi)	NBR (options: Without, FPM/FKM)
EN 837	G ⅛ B	400 bar (5,800 psi)	without (options: Copper, stainless steel)
	G ¼ B <sup>1)</sup>	1,000 bar (14,500 psi)	without (options: Copper, stainless steel)
	G ¼ female <sup>1)</sup>	1,000 bar (14,500 psi)	-
	G ½ B <sup>1)</sup>	1,000 bar (14,500 psi)	without (options: Copper, stainless steel)
ANSI/ASME B1.20.1	¼ NPT <sup>1)</sup>	1,000 bar (14,500 psi)	-
	½ NPT <sup>1)</sup>	1,000 bar (14,500 psi)	-
ISO 7	R ¼ <sup>1)</sup>	1,000 bar (14,500 psi)	-
KS	PT ¼ <sup>1)</sup>	1,000 bar (14,500 psi)	-
-	G ¼ female (Ermeto compatible)	1,000 bar (14,500 psi)	-
	G ½ B flush	1,000 bar (14,500 psi)	NBR (option: FPM/FKM)

1) suitable for oxygen, oil and grease free.

Other connections on request.

### Restrictor (option)

For applications where pressure spikes can occur, the use of a restrictor is recommended. The restrictor narrows the pressure port to 0.3 mm and thus increases the resistance against pressure spikes.

## Electrical connections

### Connections

- Circular connector M12 x 1 (4-pin)
- Circular connector M12 x 1 (5-pin) <sup>1)</sup>

1) Only for version with two switching outputs and additional analogue signal

### Electrical safety

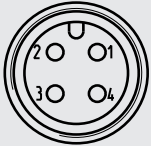
Short-circuit resistance: S+ / SP1 / SP2 vs. U-

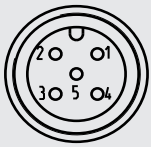
Reverse polarity protection: U+ vs. U-

Insulation voltage: DC 500 V

Overvoltage protection: DC 40 V

### Connection diagrams

Circular connector M12 x 1 (4-pin)		
	U+	1
	U-	3
	S+	2
	SP1 / C	4
	SP2	2

Circular connector M12 x 1 (5-pin)		
	U+	1
	U-	3
	S+	5
	SP1 / C	4
	SP2	2

#### Legend:

U+	Positive power supply terminal
U-	Negative power supply terminal
SP1	Switching output 1
SP2	Switching output 2
C	Communication with IO-Link
S+	Analogue output

## Approvals

Logo	Description	Country
	<b>EU declaration of conformity</b> <ul style="list-style-type: none"> <li>■ EMC directive</li> <li>■ Pressure equipment directive</li> <li>■ RoHS directive</li> </ul>	European Union
	<b>EAC</b> <ul style="list-style-type: none"> <li>■ EMC directive</li> </ul>	Eurasian Economic Community
	<b>UL</b> Safety (e.g. electr. safety, overpressure, ...)	USA and Canada

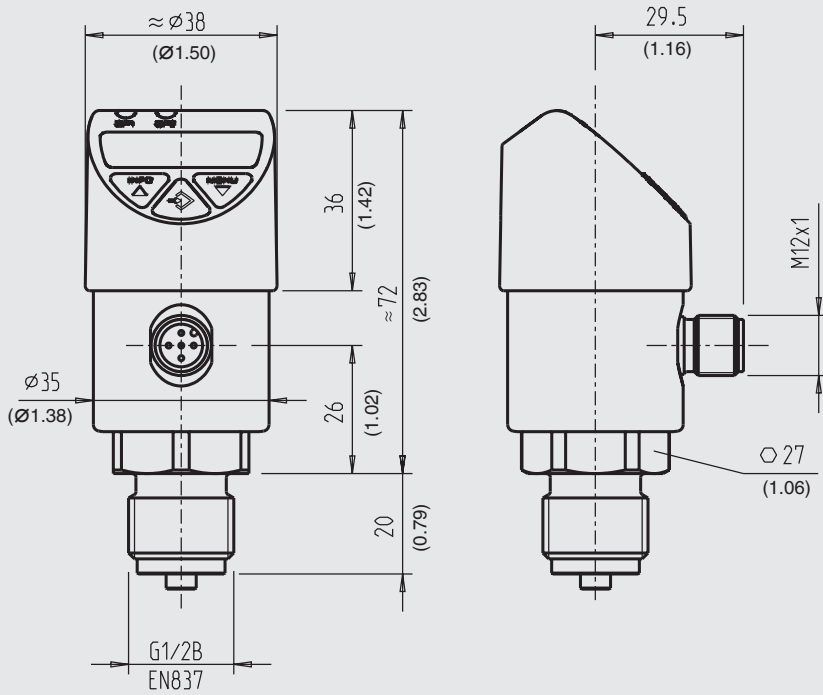
## Manufacturer's information and certifications

Logo	Description
	China RoHS directive
	MTTF > 100 years

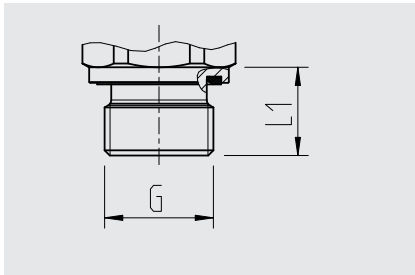
Approvals and certificates, see website

# Dimensions in mm (in)

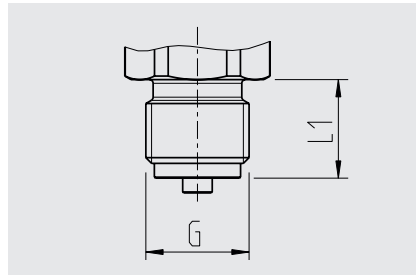
Pressure switch with circular connector M12 x 1 (4-pin and 5-pin)



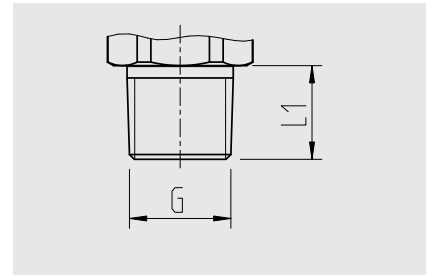
Weight: approx. 220 g (7.76 oz)



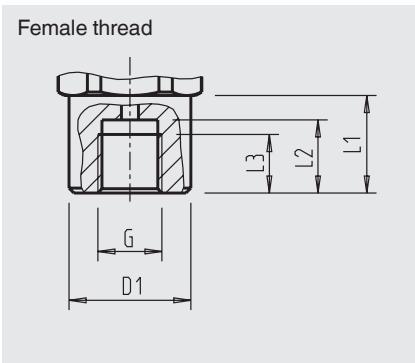
G	L1
G ¼ A DIN 3852-E	14 (0.55)
G ½ A DIN 3852-E	17 (0.67)



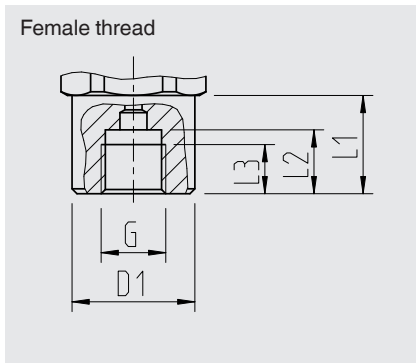
G	L1
G ¼ B EN 837	13 (0.51)
G ½ B EN 837	20 (0.79)



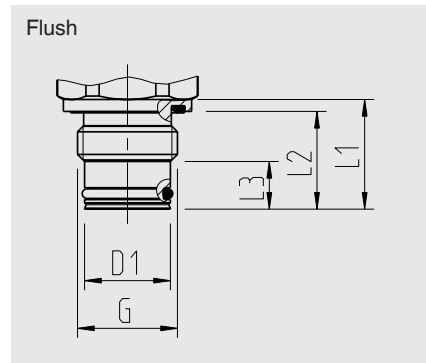
G	L1
¼ NPT	13 (0.51)
½ NPT	19 (0.75)
R ¼	13 (0.51)
PT ¼	13 (0.51)



G	L1	L2	L3	D1
G ¼ <sup>1)</sup>	20 (0.79)	15 (0.59)	12 (0.47)	Ø 25 (0.98)



G	L1	L2	L3	D1
G ¼ EN 837	20 (0.79)	13 (0.51)	10 (0.39)	Ø 25 (0.98)



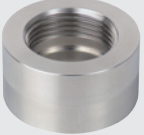
G	L1	L2	L3	D1
G ½ B <sup>2)</sup>	23 (0.91)	20.5 (0.81)	10 (0.39)	Ø 18 (0.71)

1) Ermeto compatible


2) Welding sockets recommended as defined counter-thread (see accessories)

## Accessories and spare parts



### Welding socket for flush process connections

	Description	Order no.
	G ½ B female, outer diameter 50 mm (2 in), material 1.4571	1192299


### Sealings

	Description	Order no.
	NBR profile sealing G ¼ A DIN 3852-E	1537857
	FPM/FKM profile sealing G ¼ A DIN 3852-E	1576534
	NBR profile sealing G ½ A DIN 3852-E	1039067
	FPM/FKM profile sealing G ½ A DIN 3852-E	1039075
	Copper G ¼ B EN 837	11250810
	Stainless steel G ¼ B EN 837	11250844
	Copper G ½ B EN 837	11250861
	Stainless steel G ½ B EN 837	11251042


### Connectors with moulded cable

	Description	Temperature range	Cable diameter	Order no.
	Straight version, cut to length, 4-pin, 2 m (6.6 ft) PUR cable, UL listed, IP67	-20 ... +80 °C (-4 ... 176 °F)	4.5 mm (0.18 in)	14086880
	Straight version, cut to length, 4-pin, 5 m (16.4 ft) PUR cable, UL listed, IP67	-20 ... +80 °C (-4 ... 176 °F)	4.5 mm (0.18 in)	14086883
	Straight version, cut to length, 4-pin, 10 m (32.8 ft) PUR cable, UL listed, IP67	-20 ... +80 °C (-4 ... 176 °F)	4.5 mm (0.18 in)	14086884
	Straight version, cut to length, 5-pin, 2 m (6.6 ft) PUR cable, UL listed, IP67	-20 ... +80 °C (-4 ... 176 °F)	5.5 mm (0.22 in)	14086886
	Straight version, cut to length, 5-pin, 5 m (16.4 ft) PUR cable, UL listed, IP67	-20 ... +80 °C (-4 ... 176 °F)	5.5 mm (0.22 in)	14086887
	Straight version, cut to length, 5-pin, 10 m (32.8 ft) PUR cable, UL listed, IP67	-20 ... +80 °C (-4 ... 176 °F)	5.5 mm (0.22 in)	14086888
	Angled version, cut to length, 4-pin, 2 m (6.6 ft) PUR cable, UL listed, IP67	-20 ... +80 °C (-4 ... 176 °F)	4.5 mm (0.18 in)	14086889
	Angled version, cut to length, 4-pin, 5 m (16.4 ft) PUR cable, UL listed, IP67	-20 ... +80 °C (-4 ... 176 °F)	4.5 mm (0.18 in)	14086891
	Angled version, cut to length, 4-pin, 10 m (32.8 ft) PUR cable, UL listed, IP67	-20 ... +80 °C (-4 ... 176 °F)	4.5 mm (0.18 in)	14086892
	Angled version, cut to length, 5-pin, 2 m (6.6 ft) PUR cable, UL listed, IP67	-20 ... +80 °C (-4 ... 176 °F)	5.5 mm (0.22 in)	14086893
	Angled version, cut to length, 5-pin, 5 m (16.4 ft) PUR cable, UL listed, IP67	-20 ... +80 °C (-4 ... 176 °F)	5.5 mm (0.22 in)	14086894
	Angled version, cut to length, 5-pin, 10 m (32.8 ft) PUR cable, UL listed, IP67	-20 ... +80 °C (-4 ... 176 °F)	5.5 mm (0.22 in)	14086896

**Cooling element for screwing G ½ female / G ½ male per EN 837  
(for instruments with process connection G ½ B per EN-837)**

	Description	Order no.
	Max. medium temperature 150 °C (302 °F) at an ambient temperature of max. 30 °C (86 °F) Max. operating pressure 600 bar (8,700 psi)	14109813
	Max. medium temperature 200 °C (392 °F) at an ambient temperature of max. 30 °C (86 °F) Max. operating pressure 600 bar (8,700 psi)	14109815

**Instrument mounting bracket**

	Description	Order no.
	Instrument mounting bracket for PSD-4, aluminium, wall mounting	11467887