

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 ¹⁾ | 0 ... 0.6 ¹⁾ | 0 ... 1 ¹⁾ | 0 ... 1.6 ¹⁾ | 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 ¹⁾ | 0 ... 15 ¹⁾ | 0 ... 25 ¹⁾ | 0 ... 30 ¹⁾ | 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 ¹⁾ | 0 ... 0.6 ¹⁾ | 0 ... 1 ¹⁾ | 0 ... 1.6 ¹⁾ | 0 ... 2.5 | 0 ... 4 | 0 ... 6 | 0 ... 10 |
| | 0 ... 16 | 0 ... 25 | | | | | | |
| psi | 0 ... 10 ¹⁾ | 0 ... 15 ¹⁾ | 0 ... 25 ¹⁾ | 0 ... 30 ¹⁾ | 0 ... 50 | 0 ... 100 | 0 ... 160 | 0 ... 200 |
| | 0 ... 300 | | | | | | | |

| Vacuum and +/- measuring range | | | | | | | | |
|--------------------------------|---------------------------|-----------------------------|---------------|---------------|----------------|----------------|----------------|----------------|
| bar | -1 ... 0 ¹⁾ | -1 ... +0.6 ¹⁾ | -1 ... +1.5 | -1 ... +3 | -1 ... +5 | -1 ... +9 | -1 ... +15 | -1 ... +24 |
| psi | -14.5 ... 0 ¹⁾ | -14.5 ... +15 ¹⁾ | -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/cm² 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: ≤ 5 ms

Switching output: ≤ 5 ms

Load

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

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

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:

≤ 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

≤ 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) ¹⁾, 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/m²
- Oxygen, oil and grease free:
Residual hydrocarbon: < 200 mg/m²
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 ¹⁾ | 1,000 bar (14,500 psi) | without (options: Copper, stainless steel) |
| | G ¼ female ¹⁾ | 1,000 bar (14,500 psi) | - |
| | G ½ B ¹⁾ | 1,000 bar (14,500 psi) | without (options: Copper, stainless steel) |
| | ANSI/ASME B1.20.1 | ¼ NPT ¹⁾ | 1,000 bar (14,500 psi) |
| | ½ NPT ¹⁾ | 1,000 bar (14,500 psi) | - |
| ISO 7 | R ¼ ¹⁾ | 1,000 bar (14,500 psi) | - |
| KS | PT ¼ ¹⁾ | 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) ¹⁾

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

Electrical safety

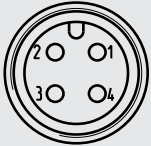
Short-circuit resistance: S+ / SP1 / SP2 vs. U-

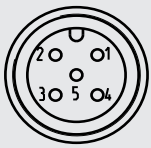
Reverse polarity protection: U+ vs. U-

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

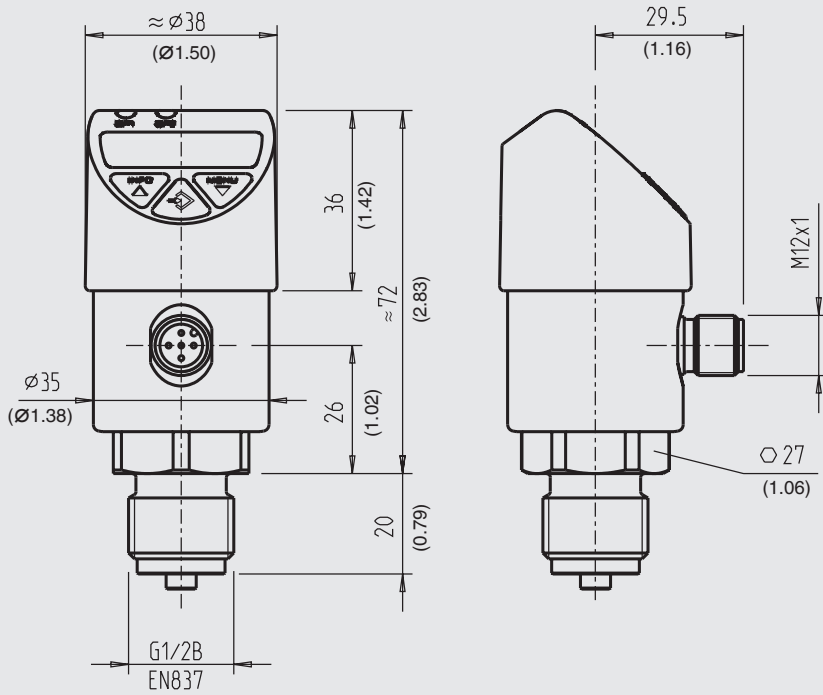
Manufacturer's information and certifications

| Logo | Description |
|------|----------------------|
| | China RoHS directive |
| | MTTF > 100 years |

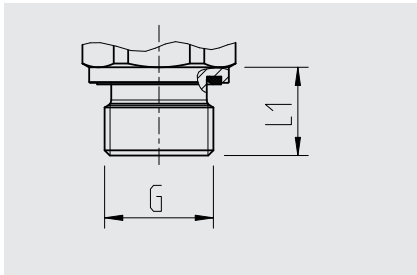
Approvals and certificates, see website

Dimensions in mm (in)

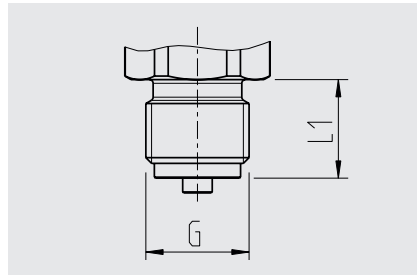
Pressure switch with circular connector M12 x 1 (4-pin and 5-pin)



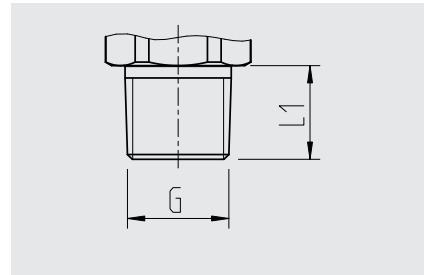
Weight: approx. 220 g (7.76 oz)



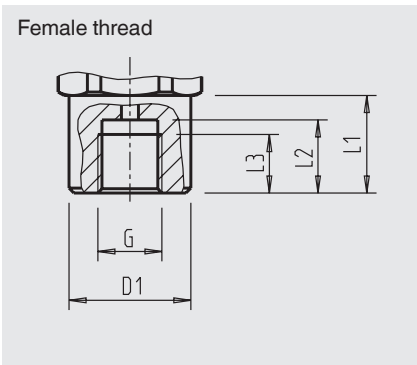
| G | L1 |
|------------------|-----------|
| G ¼ A DIN 3852-E | 14 (0.55) |
| G ½ A DIN 3852-E | 17 (0.67) |



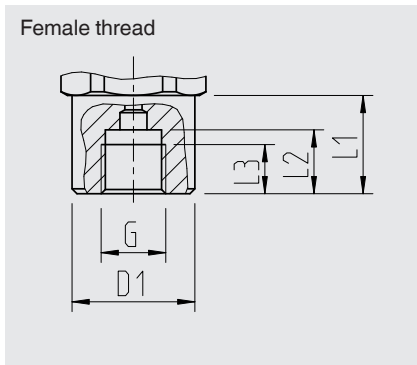
| G | L1 |
|--------------|-----------|
| G ¼ B EN 837 | 13 (0.51) |
| G ½ B EN 837 | 20 (0.79) |



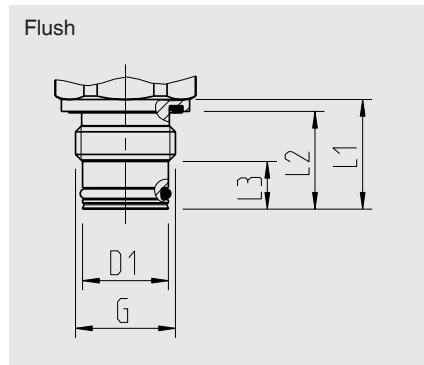
| G | L1 |
|-------|-----------|
| ¼ NPT | 13 (0.51) |
| ½ NPT | 19 (0.75) |
| R ¼ | 13 (0.51) |
| PT ¼ | 13 (0.51) |



| G | L1 | L2 | L3 | D1 |
|-------------------|--------------|--------------|--------------|----------------|
| G ¼ ¹⁾ | 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 ²⁾ | 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 |