Electronic pressure switch with display
Model PSD-4

WIKA data sheet PE 81.86

IO-Link

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: ≤ 500 Ω
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
≤ ±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:
  ≤ ±0.1 % of span (IEC 61298-2)
  ≤ ±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
≤ ±0.5 % of span

Temperature error in rated temperature range
maximum: ≤ ±1.5 % of span
maximum: ≤ ±2.5 % of span for increased overload safety and flush versions

Temperature coefficients in rated temperature range
Mean TC zero point: ≤ ±0.16 % of span/10 K
Mean TC span: ≤ ±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

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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

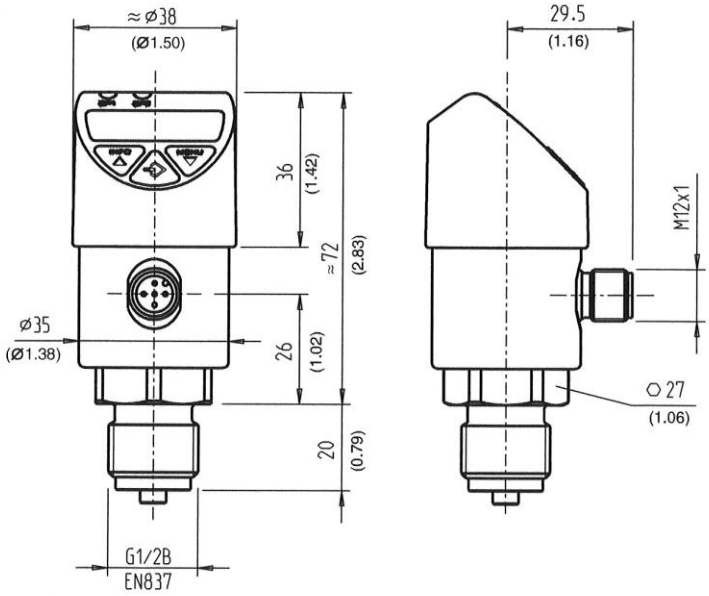
Logo	Description	Country
CE	**EU declaration of conformity** ■ EMC directive ■ Pressure equipment directive ■ RoHS directive	European Union
EAC	**EAC** ■ EMC directive	Eurasian Economic Community
cULus LISTED	**UL** Safety (e.g. electr. safety, overpressure, ...)	USA and Canada

Manufacturer's information and certifications

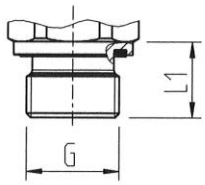
Logo	Description
	China RoHS directive
	MTTF > 100 years

Dimensions in mm (in)

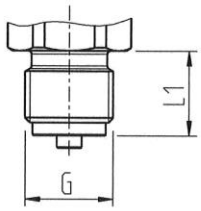
Pressure switch with circular connector M12 x 1 (4-pin and 5-pin)



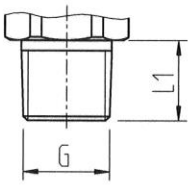
Weight: approx. 220 g (7.76 oz)



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

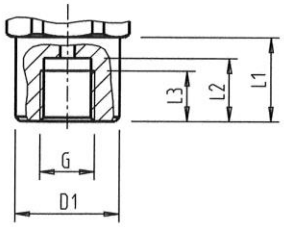


G	L1
G ¼ B EN 837	13 (0.51)
G ½ B EN 837	20 (0.79)



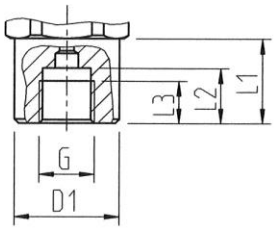
G	L1
¼ NPT	13 (0.51)
½ NPT	19 (0.75)
R ¼	13 (0.51)
PT ¼	13 (0.51)

Female thread



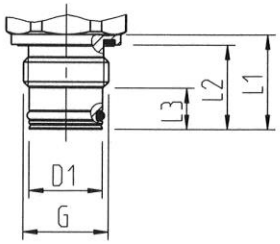
G	L1	L2	L3	D1
G ¼ [1]	20 (0.79)	15 (0.59)	12 (0.47)	Ø 25 (0.98)

Female thread



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

Flush



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
	G ½ B female, outer diameter 50 mm (2 in), material 1.4571

Sealings	
	Description
	NBR profile sealing G ¼ A DIN 3852-E
	FPM/FKM profile sealing G ¼ A DIN 3852-E
	NBR profile sealing G ½ A DIN 3852-E
	FPM/FKM profile sealing G ½ A DIN 3852-E
	Copper G ¼ B EN 837
	Stainless steel G ¼ B EN 837
	Copper G ½ B EN 837
	Stainless steel G ½ B EN 837

Connectors with moulded cable			
	Description	**Temperature range**	**Cable diameter**
	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)
	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)
	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)
	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)
	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)
	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)
	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)
	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)
	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)
	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)
	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)
	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)

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
	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) 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)

Instrument mounting bracket	
	Description
	Instrument mounting bracket for PSD-4, aluminium, wall mounting

Ordering information

Model / Measuring range / Output signal / Options for specific media / Process connection / Sealing

WIKA

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Art. No.	Type No.
103073	EDS-1
103074	EDS-2
103075	EDS-4
103076	EDS-6
103077	EDS-10
103078	EDS-16
103079	EDS-25
103080	EDS-40
103081	EDS-60
103082	EDS-100
103083	EDS-160
103084	EDS-250
103085	EDS-400
103086	EDS-600
103087	EDS-SG
103088	EDS-SW
103089	EDS-KG2
103090	EDS-KG5
103091	EDS-KW2
103092	EDS-KW5

Connection plug		
Article nr.	Type nr.	Description
103087	EDS-SG	Straight connection plug, 4-pole, without cable
103088	EDS-SW	Angled connection plug, 4-pole, without cable
103089	EDS-KG2	Straight connection plug, 4-pole, with PUR cable 2m
103090	EDS-KG5	Straight connection plug, 4-pole, with PUR cable 5 m
103091	EDS-KW2	Angled connection plug, 4-pole, with PUR cable 2 m
103092	EDS-KW5	Angled connection plug, 4-pole, with PUR cable 5 m