

# OEM pressure switch with display Model PSD-4-ECO

WIK A data sheet PE 81.69



## Applications

- Machine tools
- Hydraulics and pneumatics
- Automation engineering
- Special-purpose machine building

## Special features

- Good/bad indication through parameterisable digital display (red/green)
- Compact size enables easy installation in narrow spaces
- Optimised design makes OEM machine integration easier
- Designed for rough demands of up to 50 g shock and -40 ... +125 °C [-40 ... +257 °F]



OEM pressure switch with display, model PSD-4-ECO

## Description

The model PSD-4-ECO is a programmable electronic pressure switch designed specifically for OEM customers. With IO-Link 1.1, the cost-effective and reliable model PSD-4-ECO is a future-proof automation solution. Through individual factory pre-configuration, the pressure switch can also be quickly and simply integrated into the machine without any programming effort.

### Fast error detection through colour feedback

With the model PSD-4-ECO pressure switch, it is very easy to determine if the system is operating within the desired pressure range. The instrument can be parameterised such that the digital display lights up green when the value is within the defined pressure range and red if not. In this way, problems can be identified early.

### Optimised for tight mounting spaces

With a diameter of 29 mm, the model PSD-4-ECO is very slim. Through the arrangement of the electrical output, it can be installed so that it uses little space. The display head can

be rotated through 335° and the display tilted electronically through 180°, so that the pressure display is always aligned towards the user.

### Optimised for OEM integration

The pressure switch is specially adapted to the requirements of OEM series production. For example, units of 25 pieces reduce the packaging material and make handling easier. Customer-specific pre-configuration by WIK A or automated parameterisation via IO-Link 1.1 saves time and simplifies the integration process.

### Designed for harsh ambient conditions

Tough: The model PSD-4-ECO pressure switch is designed for medium temperatures from -40 ... +125 °C. In addition, it withstands mechanical shocks up to 50 g and high electrical loads. This makes it a highly economical and reliable solution.

## Measuring ranges

| Gauge pressure |           |             |             |             |             |             |             |             |
|----------------|-----------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| bar            | 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 ... 1,000 |             |             |             |             |             |             |
| psi            | 0 ... 10  | 0 ... 15    | 0 ... 25    | 0 ... 30    | 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 | 0 ... 0.6 | 0 ... 1  | 0 ... 1.6 | 0 ... 2.5 | 0 ... 4   | 0 ... 6   | 0 ... 10  |
|                   | 0 ... 16  | 0 ... 25  |          |           |           |           |           |           |
| psi               | 0 ... 10  | 0 ... 15  | 0 ... 25 | 0 ... 30  | 0 ... 50  | 0 ... 100 | 0 ... 160 | 0 ... 200 |
|                   | 0 ... 300 |           |          |           |           |           |           |           |

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

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 higher temperature errors.

### Overload safety

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

≤ 600 bar [≤ 8,000 psi]: 2 times

> 600 bar [> 8,000 psi]: 1.5 times

### Increased overload safety (option)

Deviating temperature errors and long-term stability with respect to the selected measuring range apply here.

### Vacuum-tight

Yes

## Digital display

7-segment LED, 2-coloured red/green, 4-digit, 8.9 mm [0.35 in] character size

Display can be rotated electronically through 180°

Colour ranges through green/red switching can be parameterised

Display can be rotated mechanically through 335°

## Output signals

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

Optionally also available with an NPN instead of a PNP switching output

### IO-Link (option)

IO-Link is available for all output signals with PNP output.

Revision: 1.1  
 Speed: 38.4 kBaud (COM2)  
 Min. cycle time: 2.3 ms  
 Master port class: A

### Adjustment of zero point offset

max. 3 % of span

### Damping of analogue output/switching outputs

0 ms ... 65 s (adjustable)

### 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 (adjustable)

### Switching voltage

Power supply - 1 V

### Switching current

max. 250 mA to 85 °C [176 °F]

max. 250 mA to 70 °C [176 °F] with UL approval

For details, see the derating curves below

### Settling time/response time

Output signal: ≤ 5 ms

Switching output: ≤ 5 ms

### Load

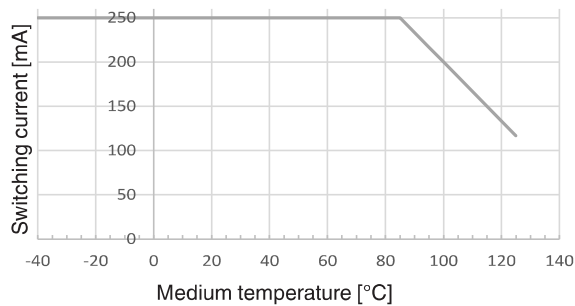
4 ... 20 mA: ≤ 500 kΩ

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

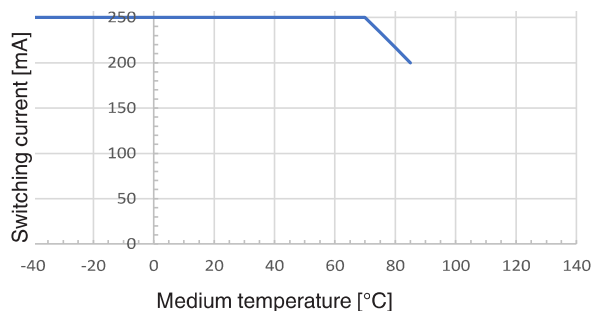
### Service life

100 million switching cycles

Derating curve per switching output (without UL approval)



Derating curve per switching output (with UL approval)



## Voltage supply

### Power supply

DC 15 ... 32 V

### Current consumption

≤ 45 mA for versions without analogue signal

≤ 70 mA for versions with analogue signal

### Total current consumption

≤ 600 mA including switching current

## Accuracy specifications

### Accuracy, analogue signal

≤ ±1.0 % of span

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

### Non-repeatability, analogue signal (IEC 61298-2)

≤ 0.1 % of span

### Long-term drift, analogue signal (IEC 61298-2)

≤ ±0.1 % of span

≤ ±0.2 % of span for measuring ranges ≤ 0.4 bar [10 psi] and for increased overload safety

### Accuracy, switching output

≤ ±1.0 % of span

### Temperature error in nominal temperature range

maximum: ≤ ±1.5 % of span

maximum: ≤ ±2.5 % of span with increased overload safety

### Temperature coefficients in nominal 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]

Air humidity: 45 ... 75 % r. h.

Nominal position: Process connection lower mount

Power supply: DC 24 V

Load: see "Output signal"

## Operating conditions

### Permissible temperature ranges

|                     | Standard                            | Option                                             |
|---------------------|-------------------------------------|----------------------------------------------------|
| Medium              | -25 ... +85 °C<br>[-13 ... +185 °F] | -40 ... +125 °C<br>[-40 ... +257 °F) <sup>1)</sup> |
| Ambient             | -20 ... +85 °C<br>[-4 ... +185 °F]  |                                                    |
| Storage             | -40 ... +70 °C<br>[-40 ... +158 °F] |                                                    |
| Nominal temperature | -20 ... +80 °C<br>[-4 ... +176 °F]  |                                                    |

1) Medium temperature restricted to -30 ... +85 °C [-22 ... +185 °F] with UL approval

### Air humidity

45 ... 75 % r. h.

### Vibration resistance

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

### Shock resistance

50 g, 11 ms (IEC 60068-2-27, mechanical)

### Service life

100 million load cycles

### Ingress protection (per IEC 60529)

IP65 and IP67

The stated ingress protection 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: 304L

Keyboard: PBT

Display window: PC

Display head: PBT+PC blend

Pressure transmission fluid:

Synthetic oil for all gauge pressure measuring ranges

< 10 bar [150 psi] <sup>1)</sup> and all absolute pressure measuring ranges

<sup>1)</sup> < 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, instrument sealed in a vacuum bag

Max. permissible temperature -20 ... +60 °C

[-4 ... +140 °F]

Available measuring ranges:

0 ... 400 mbar to 0 ... 400 bar [0 ... 10 to 0 ... 5,000 psi]

-1 ... 0 to -1 ... 24 bar [-14.5 ... 0 to -14.5 ... 300 psi]

Factory supplied without sealing

Available process connections, see "Process connections"

## Process connection

| Standard                                   | Thread size                    | Max. nominal pressure  | Sealing                                    |
|--------------------------------------------|--------------------------------|------------------------|--------------------------------------------|
| DIN EN ISO 1179-2<br>(formerly DIN 3852-E) | G ¼ A                          | 600 bar [8,700 psi]    | NBR (options: Without, FPM/FKM)            |
|                                            | G ½ A                          | 400 bar [5,800 psi]    | NBR (options: Without, FPM/FKM)            |
| EN 837                                     | 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] | Without (option: Copper, stainless steel)  |
|                                            | 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] | Without (options: Copper, stainless steel) |

<sup>1)</sup> 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 0.6 mm and thus increases the resistance against pressure spikes.

### Enlarged pressure port (option)

For applications with contaminated or viscous media, for specific process connections, an enlarged pressure port with a 6 or 12 mm diameter is available in order to reduce the risk of a pressure port blocking.

## 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

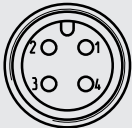
Short-circuit resistance: S+ / SP1 / SP2 vs. U-

Reverse polarity protection: U+ vs. U-

Insulation voltage: DC 500 V

Overvoltage protection: DC 36 V

### Connection diagrams

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

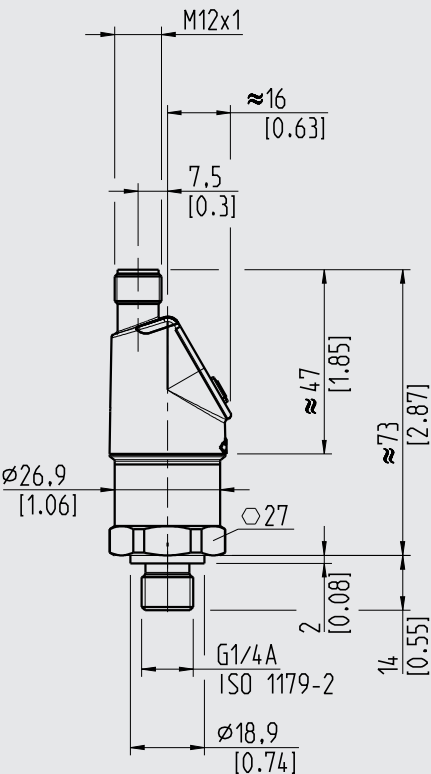
| Circular connector M12 x 1 (5-pin)                                                |         |   |
|-----------------------------------------------------------------------------------|---------|---|
|  | U+      | 1 |
|                                                                                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

### Legend:

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

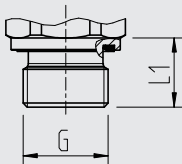
# Dimensions in mm [in]

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



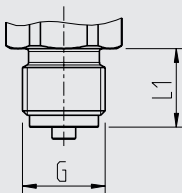
Weight: approx. 90 ... 130 g [3.17 ... 4.59 oz]

DIN EN ISO 1179-2  
(formerly DIN 3852-E)



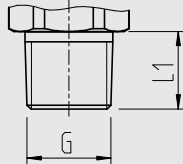
| G     | L1        |
|-------|-----------|
| G ¼ A | 14 [0.55] |
| G ½ A | 17 [0.67] |

EN 837



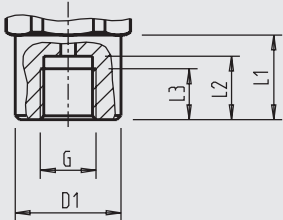
| G     | L1        |
|-------|-----------|
| G ¼ B | 13 [0.51] |
| G ½ B | 20 [0.79] |

ANSI/ASME B1.20.1  
KS  
ISO 7



| G     | L1        |
|-------|-----------|
| ¼ NPT | 13 [0.51] |
| ½ NPT | 19 [0.75] |
| R ¼   | 13 [0.51] |
| PT ¼  | 13 [0.51] |

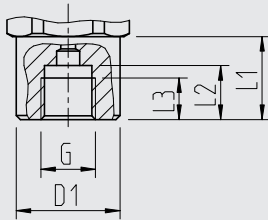
Female thread



| G   | L1        | L2        | L3        | D1          |
|-----|-----------|-----------|-----------|-------------|
| G ¼ | 20 [0.79] | 15 [0.59] | 12 [0.47] | Ø 25 [0.98] |

Ermeto compatible

EN 837, female thread



| G     | L1        | L2        | L3        | D1          |
|-------|-----------|-----------|-----------|-------------|
| G ¼ A | 20 [0.79] | 13 [0.51] | 10 [0.39] | Ø 25 [0.98] |

## Accessories and spare parts

| Sealings                                                                          |                                                                       |              |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------|--------------|
|                                                                                   | Description                                                           | Order number |
|  | NBR profile sealing G ¼ A DIN EN ISO 1179-2 (formerly DIN 3852-E)     | 1537857      |
|                                                                                   | FPM/FKM profile sealing G ¼ A DIN EN ISO 1179-2 (formerly DIN 3852-E) | 1576534      |
|                                                                                   | NBR profile sealing G ½ A DIN EN ISO 1179-2 (formerly DIN 3852-E)     | 1039067      |
|                                                                                   | FPM/FKM profile sealing G ½ A DIN EN ISO 1179-2 (formerly 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 number |
|    | Straight version, cut to length, 4-pin, 2 m [6.6 ft]<br>PUR cable, UL listed, IP67   | -20 ... +80 °C<br>[-4 ... 176 °F] | 4.5 mm<br>[0.18 in] | 14086880     |
|                                                                                     | Straight version, cut to length, 4-pin, 5 m [16.4 ft]<br>PUR cable, UL listed, IP67  | -20 ... +80 °C<br>[-4 ... 176 °F] | 4.5 mm<br>[0.18 in] | 14086883     |
|                                                                                     | Straight version, cut to length, 4-pin, 10 m [32.8 ft]<br>PUR cable, UL listed, IP67 | -20 ... +80 °C<br>[-4 ... 176 °F] | 4.5 mm<br>[0.18 in] | 14086884     |
|                                                                                     | Straight version, cut to length, 5-pin, 2 m [6.6 ft]<br>PUR cable, UL listed, IP67   | -20 ... +80 °C<br>[-4 ... 176 °F] | 5.5 mm<br>[0.22 in] | 14086886     |
|                                                                                     | Straight version, cut to length, 5-pin, 5 m [16.4 ft]<br>PUR cable, UL listed, IP67  | -20 ... +80 °C<br>[-4 ... 176 °F] | 5.5 mm<br>[0.22 in] | 14086887     |
|                                                                                     | Straight version, cut to length, 5-pin, 10 m [32.8 ft]<br>PUR cable, UL listed, IP67 | -20 ... +80 °C<br>[-4 ... 176 °F] | 5.5 mm<br>[0.22 in] | 14086888     |
|  | Angled version, cut to length, 4-pin, 2 m [6.6 ft]<br>PUR cable, UL listed, IP67     | -20 ... +80 °C<br>[-4 ... 176 °F] | 4.5 mm<br>[0.18 in] | 14086889     |
|                                                                                     | Angled version, cut to length, 4-pin, 5 m [16.4 ft]<br>PUR cable, UL listed, IP67    | -20 ... +80 °C<br>[-4 ... 176 °F] | 4.5 mm<br>[0.18 in] | 14086891     |
|                                                                                     | Angled version, cut to length, 4-pin, 10 m [32.8 ft]<br>PUR cable, UL listed, IP67   | -20 ... +80 °C<br>[-4 ... 176 °F] | 4.5 mm<br>[0.18 in] | 14086892     |
|                                                                                     | Angled version, cut to length, 5-pin, 2 m [6.6 ft]<br>PUR cable, UL listed, IP67     | -20 ... +80 °C<br>[-4 ... 176 °F] | 5.5 mm<br>[0.22 in] | 14086893     |
|                                                                                     | Angled version, cut to length, 5-pin, 5 m [16.4 ft]<br>PUR cable, UL listed, IP67    | -20 ... +80 °C<br>[-4 ... 176 °F] | 5.5 mm<br>[0.22 in] | 14086894     |
|                                                                                     | Angled version, cut to length, 5-pin, 10 m [32.8 ft]<br>PUR cable, UL listed, IP67   | -20 ... +80 °C<br>[-4 ... 176 °F] | 5.5 mm<br>[0.22 in] | 14086896     |

## 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>UL</b><br>Safety (e.g. electr. safety, overpressure, ...)                                                                                                        | USA and Canada |

## Manufacturer's information and certificates

| Logo | Description                 |
|------|-----------------------------|
| -    | <b>China RoHS directive</b> |
| -    | <b>MTTF &gt; 100 years</b>  |

## Patents, property rights

Protected design, registered under DPMA (German patent and trade mark office) no. 402017001481-0001

Approvals and certificates, see website

## Ordering information

Model / Accuracy / Measuring range / Process connection / Sealing / Medium temperature / Output signal / Options for special media and overload safety

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