OCTOGON

MANUAL

PDKA

DIFFERENTIAL PRESSURE SENSOR WITH DISPLAY

Operating instructions



Document	Version	Date	Applies to
Operating instructions	V00x	11/2026	PDKA, all ranges, connections and outputs

This manual describes the PDKA differential pressure sensor with display: safety, technical data, dimensions, pin assignment, installation, switching functions, operation with the two menu levels, maintenance and removal.

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1 About this manual

Read this manual before installing and commissioning the device and keep it available for later use. Device data in this manual refer to the PDKA data sheet.

1.1 Signal words

Safety instructions protect users from dangerous situations and/or prevent material damage. The severity of the potential risk is indicated by the following signal words:

Signal word	Meaning
Danger	Imminent danger to the user. Failure to comply may result in fatal injury.
Warning	Identifiable hazard. Failure to comply may result in fatal injury and in damage to equipment or plant parts.
Caution	Danger. Failure to comply may result in minor injury and in material damage to the sensor (switch) and/or the plant.
Important	Information that is important to the user.

1.2 Versions covered

Feature	Versions
Differential range	0 ... 0.1 / 0.2 / 0.5 / 1 / 5 / 6 / 10 / 16 / 25 bar
High and low side connection	selectable per side: G1/4 female · G1/4 male · G1/2 male · M20 × 1.5 male
Output	two switching outputs / frequency (4-pin) · one switching output / IO-Link / frequency + analogue (4-pin) · two switching outputs / IO-Link / frequency + analogue (5-pin) · RS485 (4-pin)
Basic type	PS510

2 Safety

2.1 Intended use

The PDKA measures the differential pressure between a high and a low side, shows it on an LED display and provides switching, analogue, frequency and IO-Link or RS485 outputs for industrial applications.

Danger Use the device only within the specified application range. The temperature must be within the permissible range. Do not exceed the rated pressure and the rated electrical load. Installation, commissioning and operation must be carried out in accordance with the applicable national and local safety regulations.

2.2 Personnel

The sensor may be set up and operated only by authorised personnel.

Caution Do not put the switch into operation if the sensor itself or the connecting cable is damaged. Do not use sharp or hard objects to operate the keys; they may damage the keys.

Warning The surface of the housing may become very hot at high operating temperatures.

2.3 Disposal

Sensors (switches) must be handled correctly in accordance with national or local regulations for electrical and electronic equipment. Sensors (switches) must not be disposed of with household waste.

3 Product description

3.1 Working principle

A diffused silicon sensor measures the difference between the high (H) and low (L) side. Both sides together withstand a static pressure below 10 MPa, one side alone 2.5 times the full scale. The connections are chosen per side. The display head rotates by 330°. Switching points and outputs are set with three keys and a menu.

3.2 Display and keys

Element	Function
SP1 / SP2 signal lamp	switching state of output 1 / output 2
4-digit LED display	measured value, menu items and values
Unit indicator lamps	unit of the displayed value
– / +	move between the menu items; change a value
M	open the menu or an item, confirm, exit

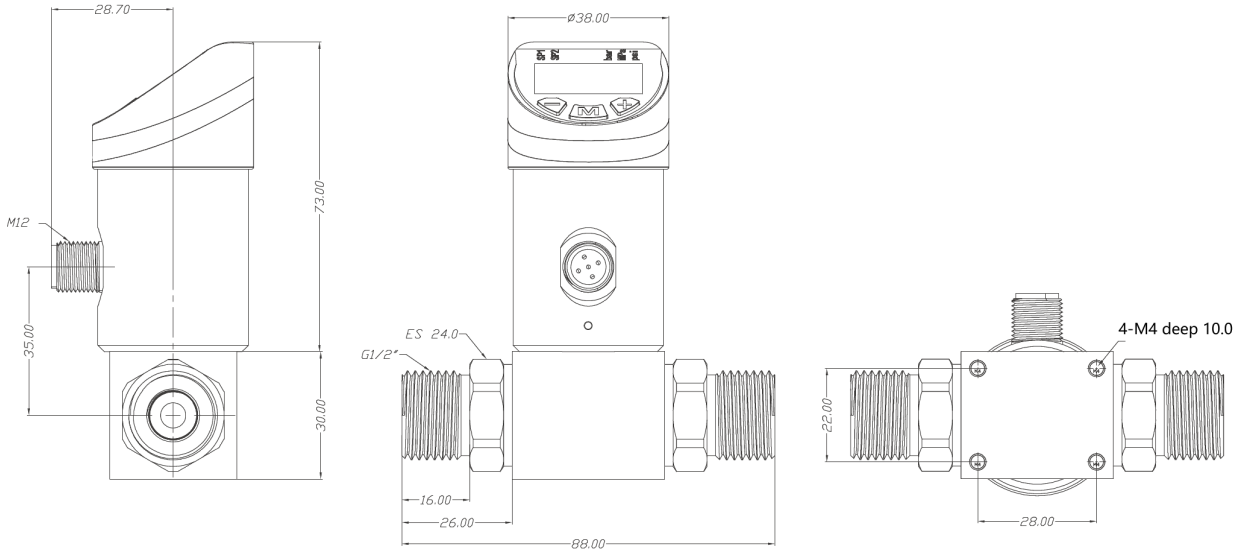
3.3 Technical data

Item	Value
Measuring principle	diffused silicon sensor
Accuracy	≤ ± 0.5 % F.S.
Linearity	≤ 0.5 % F.S.
Stability (annual drift)	≤ ± 0.3 % F.S.
Switching accuracy	≤ ± 0.5 % F.S.
Analogue output accuracy	≤ ± 0.5 % F.S.
Overload, one side	2.5 × full scale
Static pressure (both sides)	< 10 MPa
Medium temperature	–20 … +85 °C
Ambient temperature	–20 … +80 °C
Storage temperature	–30 … +80 °C
Display head	engineering plastic, flame class UL-94 V-0, rotatable 330°
Housing	stainless steel 304

Item	Value
Wetted parts	stainless steel 304
Protection class	IP67
Electrical connection	M12 × 1 connector
Supply voltage	12 … 30 V DC
No-load current	max. 40 mA at 24 V DC
Protection	reverse polarity, overload, short circuit
Switching output	PNP / NPN switchable, NO / NC selectable
Switching load	< 200 mA / 24 V DC
Response time	0.01 … 2 s
Analogue output	4 … 20 mA / 1 … 5 V / 0 … 10 V selectable
Load	≤ 500 Ω
Frequency output	100 Hz at full scale
Communication	IO-Link / RS485
Display	4-digit LED, red, 12 mm high
Display range	–1999 … 9999
Operation	three keys with menu

4 Dimensions

Dimensions in mm. Threads 4 × M4, 10 deep. ES = width across flats.



5 Pin assignment M12 × 1

Pin · wire	Two switching outputs + analogue (5-pin)	One switching output + analogue (4-pin)
1 · BN brown	supply +	supply +
3 · BU blue	supply –	supply –
4 · BK black	OUT1: SP1 PNP (default) / NPN · IO-Link · frequency	OUT1: SP1 PNP (default) / NPN · IO-Link · frequency
2 · WH white	OUT2: SP2 PNP (default) / NPN	OUT2: 4 … 20 mA (default) / 1 … 5 V / 0 … 10 V
5 · GY grey	OUT3: 4 … 20 mA (default) / 1 … 5 V / 0 … 10 V	–

Pin · wire	Two switching outputs (4-pin)	RS485 (4-pin)
1 · BN brown	supply +	supply +
3 · BU blue	supply –	supply –
4 · BK black	OUT1: SP1 PNP (default) / NPN · frequency	RS485 B
2 · WH white	OUT2: SP2 PNP (default) / NPN	RS485 A

Protocol and registers of the RS485 interface, the IO-Link device description and the setting of the frequency output are not part of this manual; please ask.

6 Installation

Caution Avoid vibration and violent shocks during transport. Even if the housing of the sensor (switch) is not damaged, internal components may break and cause failure.

Danger Install sensors (switches) only in systems that do not exceed the maximum pressure Pmax (see type label). Install sensors (switches) only when the system is de-energised and depressurised (electrical, hydraulic/pneumatic).

- Make sure that the system is depressurised before installing or removing the sensor.
- Connect the sensor to the selected process connection.
- Threaded connections: tighten fully; recommended tightening torque 25 … 35 N·m.
- In critical applications (such as violent vibration or shocks) the pressure connection can be mechanically decoupled with a miniature hose.

The sensor measures the difference between the high side (H) and the low side (L). Do not exceed the static pressure of < 10 MPa (both sides) and the one-sided overload of 2.5 × full scale.

7 Switching functions

When the pressure rises above or falls below the set switching limits (SP, rP), the switching state of the output changes. The following switching functions can be selected (menu **ou1** / **ou2**):

Function	Menu value
Hysteresis function, normally open	**Hno**
Hysteresis function, normally closed	**Hnc**
Window function, normally open	**Fno**
Window function, normally closed	**Fnc**

- Hysteresis function: first set the switch point SP, then the reset point rP. If SP is changed again, the hysteresis changes with it.
- Window function: the width of the window is set by the difference between SP and rP; SP = upper limit value, rP = lower limit value.

8 Operation

8.1 Navigation

- In the display, press **M** to open the level 1 menu.
- **+** and **–** move between the menu items; **M** opens the selected item and shows its value, **M** returns to the list.
- To change a value, hold **+** or **–** for at least 1 s. After 1 s the value can be changed: each press changes the value, holding the key changes it continuously.
- At **EF** in the level 1 menu, **M** opens the level 2 menu and **+** returns to the display. At **EF** at the end of the level 2 menu, **M** returns to the start of the level 2 menu and **+** returns to the display.

8.2 Level 1 menu

Menu	Function	Factory setting
SP1	switch point of output 1	0.2 of the range
rP1	reset point of output 1	SP1 – 0.5
SP2	switch point of output 2 [1]	0.8 of the range
rP2	reset point of output 2 [1]	SP2 – 0.5
ASP	lower range value of the analogue output [2]	lower range limit
AEP	upper range value of the analogue output [2]	upper range limit
EF	**M**: open the level 2 menu · **+**: return to the display	–

[1] not available in versions with one switching output.

[2] not available in versions without analogue output.

8.3 Level 2 menu

Menu	Function	Factory setting
rES	factory data reset: hold **+** to restore the factory settings	–
ou1	switching function of output 1: **Hno**, **Hnc**, **Fno**, **Fnc** (chapter 7); IO-Link only in versions with IO-Link	**Hno**
ou2	switching function of output 2: **Hno**, **Hnc**, **Fno**, **Fnc** [1]	**Hnc**
dS1	switching delay of output 1	0 s
dr1	reset delay of output 1	0 s
dS2	switching delay of output 2 [1]	0 s
dr2	reset delay of output 2 [1]	0 s
uni	unit of the displayed value	–
-dP-	number of decimal places	–
P-n	switching output PNP or NPN	PNP
Lo	historical minimum of the measured value	–
Ho	historical maximum of the measured value	–
dAP	damping of the switch points, of the IO-Link process data and of the display	0.06
diS	update rate of the display: **d1** = every 10 ms, **d2** = every 100 ms, **d3** = every 600 ms	**d1**
ZERo	zero cut-off (% of full scale)	0.5
dAA	display refresh time, analogue	0.01
iout	analogue output [2]: **4-20** = 4 ... 20 mA, **1-5F** = 1 ... 5 V, **010F** = 0 ... 10 V	4 ... 20 mA
EF	**M**: back to the start of the level 2 menu · **+**: return to the display	–

[1] not available in versions with one switching output.

[2] not available in versions without analogue output.

8.4 RS485 version

In the RS485 version the menus contain the following items (navigation as in 8.1).

Menu	Function	Factory setting
id	level 1: device address	1
bAud	level 1: baud rate (code)	2
EF	level 1: **M**: open the level 2 menu · **+**: return to the display	–
rES	level 2: factory data reset: hold **+** to restore the factory settings	–
uni	level 2: unit of the displayed pressure: bar, MPa, psi	–
Lo	level 2: historical minimum of the pressure	–
Ho	level 2: historical maximum of the pressure	–
dAP	level 2: damping of the switch points, of the process data and of the display	–
diS	level 2: update rate of the display: **d1** = every 10 ms, **d2** = every 100 ms, **d3** = every 600 ms	**d1**
ZERo	level 2: zero cut-off (% of full scale)	0.5
EF	level 2: **M**: back to the start of the level 2 menu · **+**: return to the display	–

The meaning of the baud rate codes is not part of this manual; please ask.

9 Maintenance, cleaning and removal

9.1 Maintenance and cleaning

Sensors (switches) do not require maintenance.

Warning Periodically check whether the switch is working properly. If the switch does not work properly, stop the operation immediately.

Caution Unsuitable cleaning agents may damage the switch.

The following cleaning agents can be used to clean polycarbonate: mild soap or detergent, isopropyl alcohol. Rinse with water immediately after cleaning. Do not leave cleaning agent on the surface of the product. Do not clean the product in high heat or in direct sunlight.

The following cleaning agents are known to affect the integrity of polycarbonate components and must not be used:

- ZEP Fast 505, Pinesol, Formula 409
- halogenated solvents (benzene, gasoline, acetone or carbon tetrachloride)
- strong alkalis
- methyl ethyl ketone
- abrasive substances

9.2 Removal

Danger Remove the switch only when it is depressurised and de-energised (electrical, hydraulic/pneumatic). Disconnecting the switch from pressure and power supply must be performed by trained or instructed personnel in accordance with the state of the art.

Warning The surface of the housing may become very hot at high operating temperatures.