



**Operating Instruction
for
Electronic Pressure Switch**

Model: PDD



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2. Note

Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.

The instruction manuals on our website www.kobold.com are always for currently manufactured version of our products. Due to technical changes, the instruction manuals available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email (info.de@kobold.com) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form against an applicable postage fee.

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

2.1. Notes on the machine and pressure equipment directive

When used in machines, the PDD should be used only when the machines fulfil the EC-machine guidelines.

as per PED 2014/68/EU

"Pressure gauges with a volume ≤ 0.1 L"

In acc. with Article 4 Paragraph (3), "Sound Engineering Practice", of the PED 2014/68/EU no CE mark.

Diagram 2

Vessels referred to in Article 4(1)(a)(i), second indent

3. Instrument Inspection

Instruments are inspected before shipping and sent out in perfect condition. Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service / forwarding agent immediately, since they are responsible for damages during transit.

Scope of delivery:

The standard delivery includes:

- Electronic Pressure Switch model: PDD

4. Regulation Use

Pressure switches serve for the regulation and monitoring of pressure in containers, hydraulic and pneumatic systems, and refrigeration technology etc. This instrument may only be used with liquids that are compatible with the wetted parts.

5. Operating Principle

KOBOLD pressure sensors / switches series PDD are cost effective electronic pressure switches with digital indication of actual pressure. Two switch points, on / off-switch delay and hysteresis that are within the measuring range are programmable.

A piezo resistive ceramic sensor is used. The units can be used where high switching accuracy is needed. Long-term stability, repeatability and the compact and robust design makes it an ideal unit for use in OEM applications.

6. Mechanical Connection

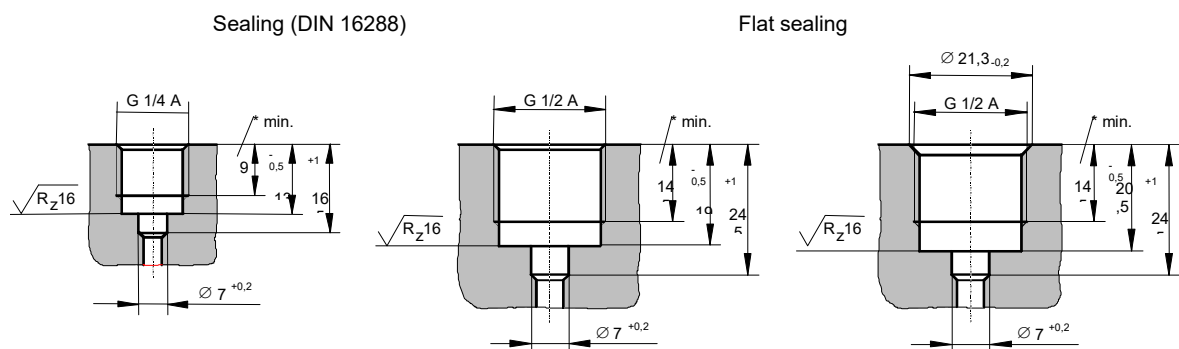
The pressure tapplings should be prepared according to the following specification for the screw-in holes.

For the purpose of sealing, disc-sealing (DIN 16 258) or profile sealing may be an adequate choice. The correct torque depends on the material, and the form of the seal and the pressure connection of the pressure sensor.

The mounting place should be free from strong vibrations and radiant heat.

The admissible site conditions of pressure sensors are to be maintained.

After making pressure connection and electrical connection, the sensors are ready for use.



7. Electrical Connection



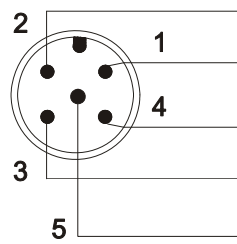
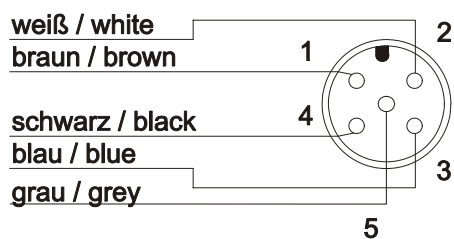
Attention! Ensure that the voltage levels of your supply system are in agreement with the voltage levels given on this manual.

- Make sure that the supply wires are de-energised.
- The connection is via an M 12x1 plug, as shown below.
- Matching couplings with different cable lengths are available optionally.



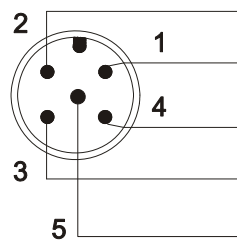
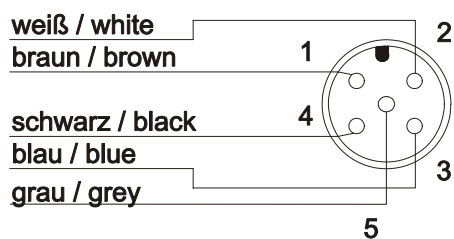
Attention! Incorrect wiring will lead to damage of the unit's electronics.

Plug connections



Plug

PDD-1	PDD-2
not connected	not connected
+24 VDC	+24 VDC
PNP-Output	NPN-Output
0 V / GND	0 V / GND
0 V / GND	0 V / GND



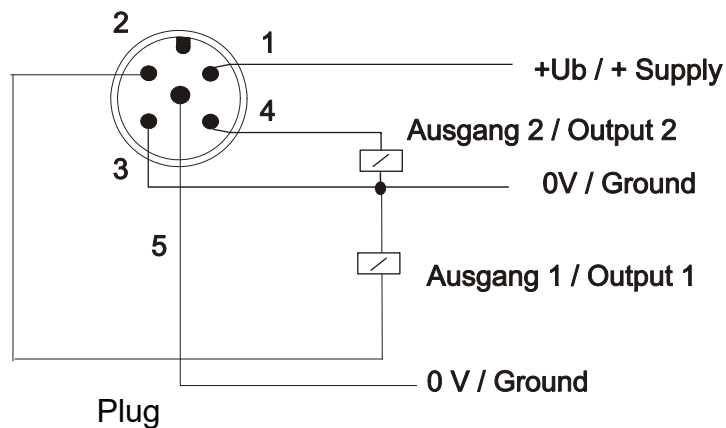
Plug

PDD-5	PDD-7
PNP-Output 1	NPN-Output 1
+24 V _{DC}	+24 V _{DC}
PNP-Output 2	NPN-Output 2
0 V / GND	0 V / GND
0 V / GND	0 V / GND

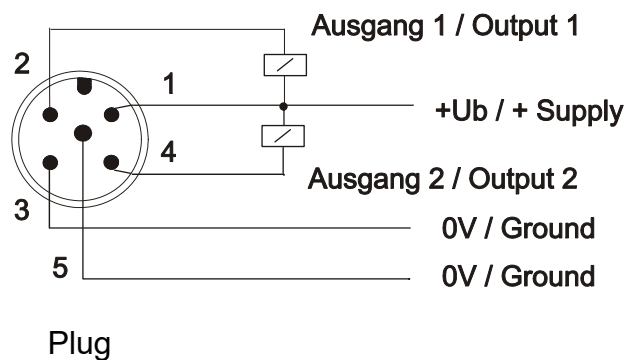
Accessories

Plug with cable ZUB-KAB-12K002

PNP Wiring



NPN Wiring



8. Commissioning






Attention! Please take note that during operation at high temperatures, the surface and the elements within the unit may become very hot!

Connect the pressure switch according to the figure shown on the previous page, and supply the device with the specified voltage.

After switching the unit on, the measuring range (full scale) is displayed for 3 seconds.

8.1. Function Keys



In Normal mode (Measuring mode)


 : Press 3 sec → set-up mode
 : Switch point/display window point
 : Switch point/display hysteresis

PDD-1x and PDD-2x

PDD-5x and PDD-7x

In set up mode

 : Next level
 : Change value

Any time:
 3 sec. 
 or 20 sec.
 Without pressing any
 key ↓
 Normal Mode

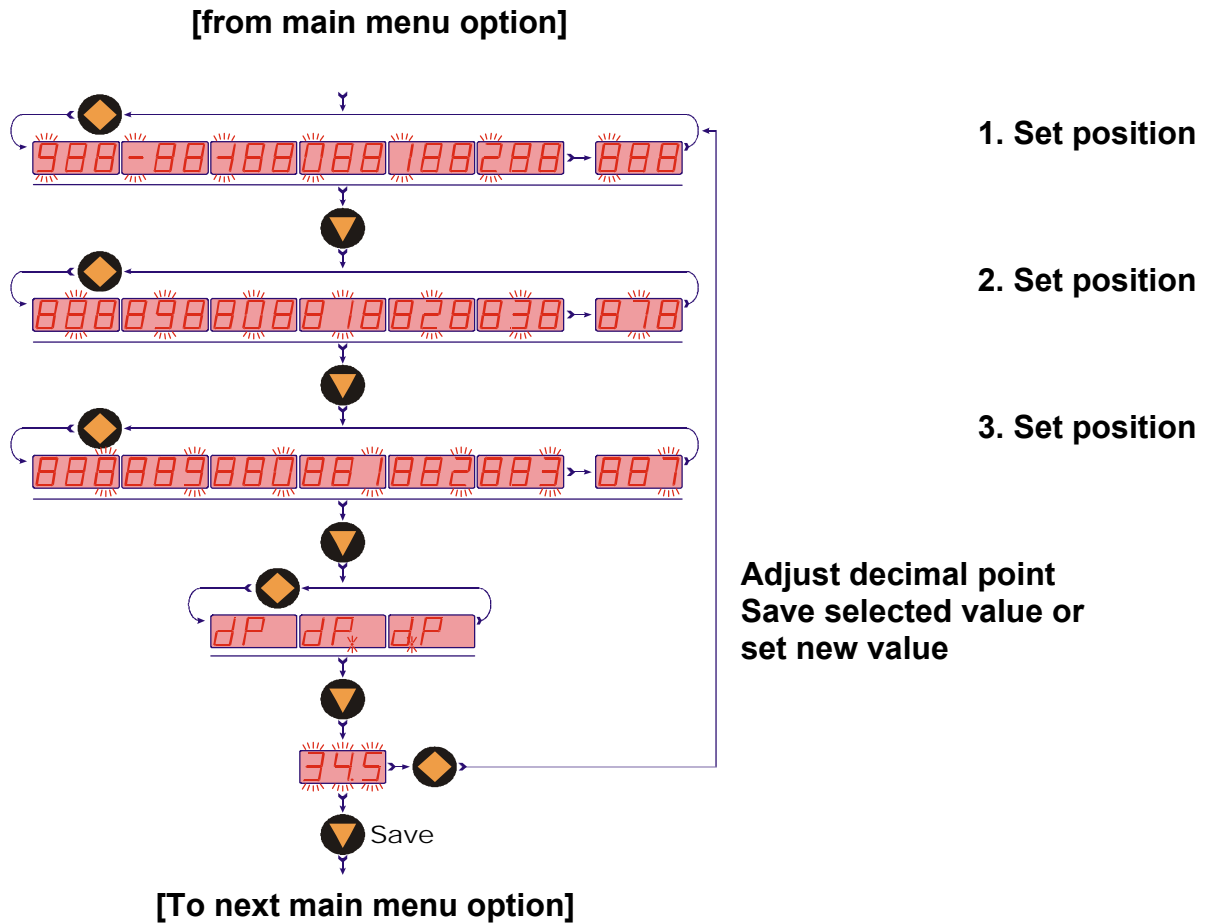
9. Set-Up

The following parameters may be changed:

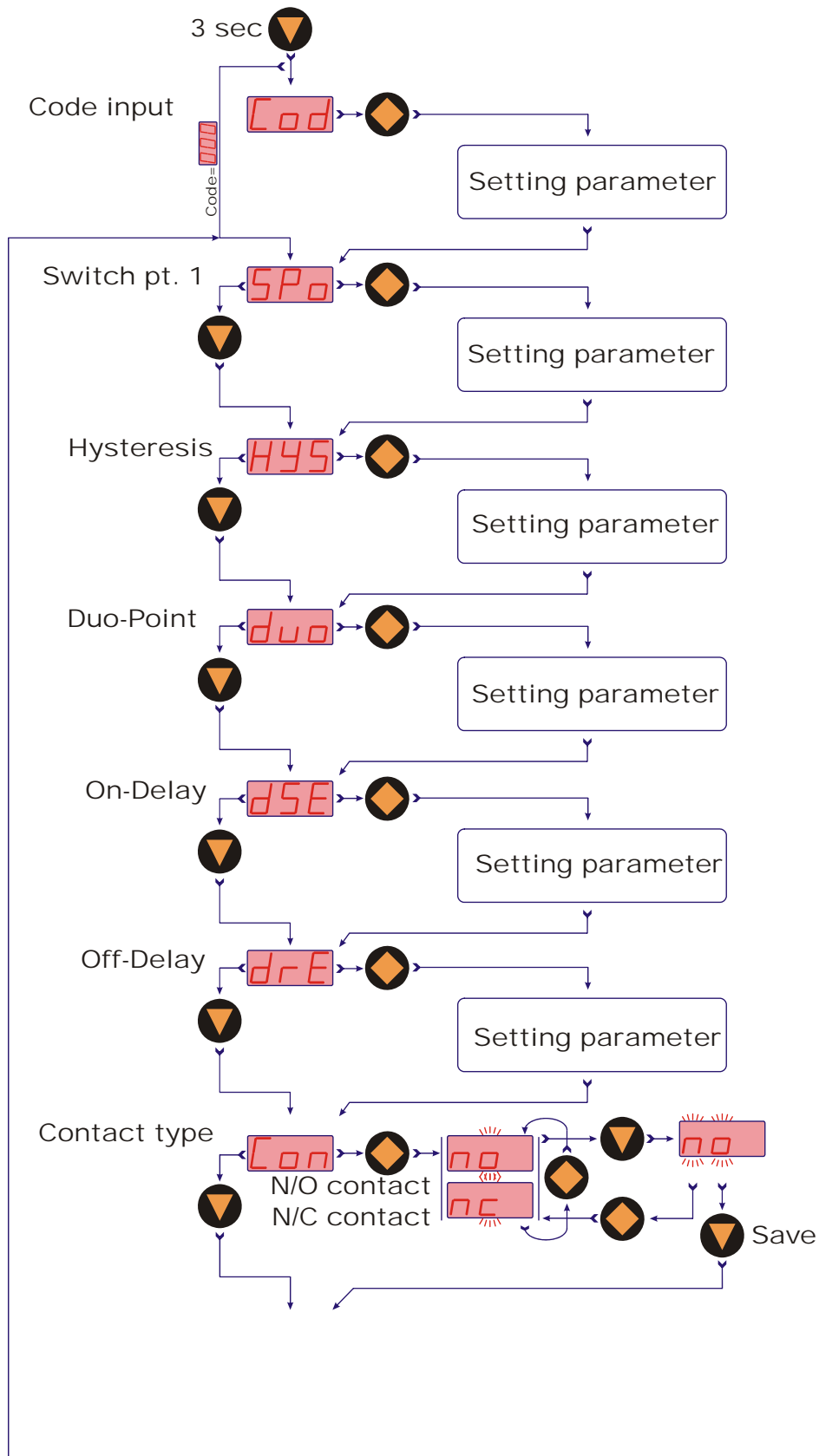
	Display range	Standard factory pre-set
Switch point (Spo, SP1, SP2)	-199...999	50 % f.s.
Hysteresis (HYS, HY1, HY2)	-199...0	000
Window point (duo, only PDD-1/-2)	Switch point ...999	--- (inactive)
Filter (Filt)	1/2/4/8/16/32/64	1
Time response (dS1, dS2, dr1, dr2) ->PDD -5/7 (dSE,drE) -> PDD -1/2	0,0...99,5 sec.	0,0
Contact type (Con, Co1, Co2)	(N.O.) or (N.C.) contact	N.O. contact
Zero-point (S-A, Start adjust)	000	is adjusted
Code (CCo, change code)	000...999	000

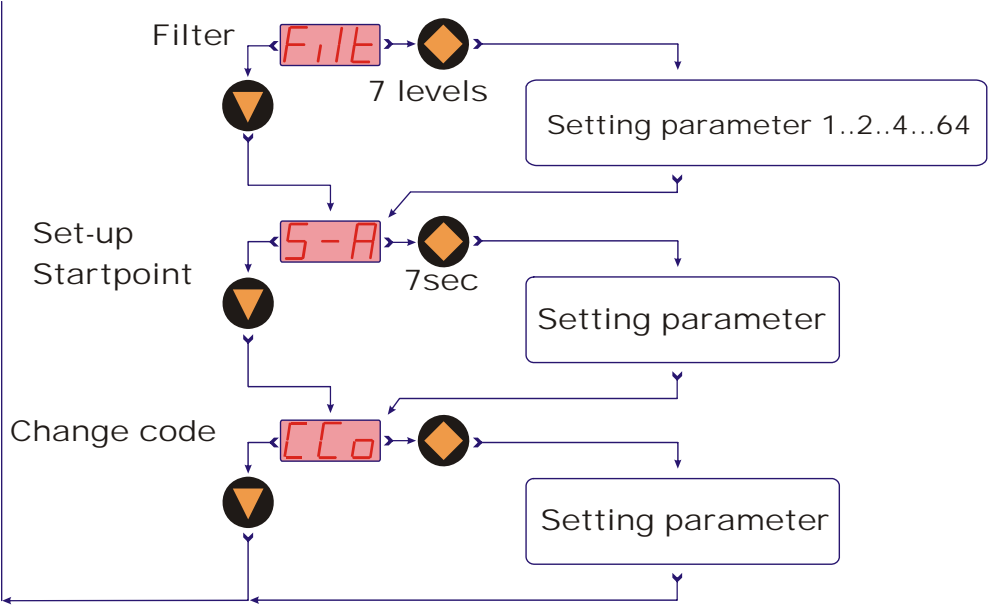
9.1. Parameter setting

From main menu option (e.g. Switching point, "SPo"), press "◆" key in order to go to Parameter set up. The following flow diagram shows the sequence of steps required to change a single parameter.

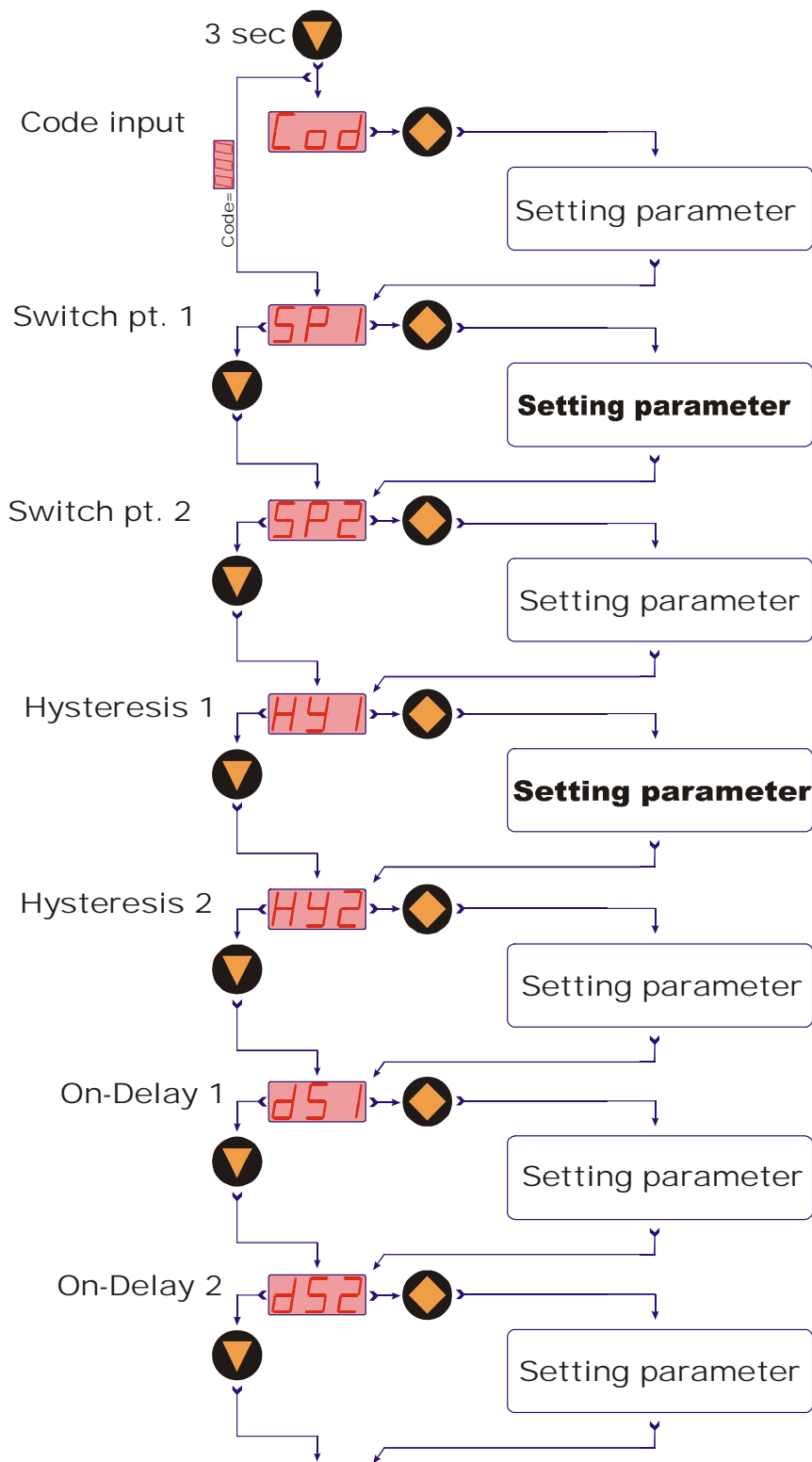


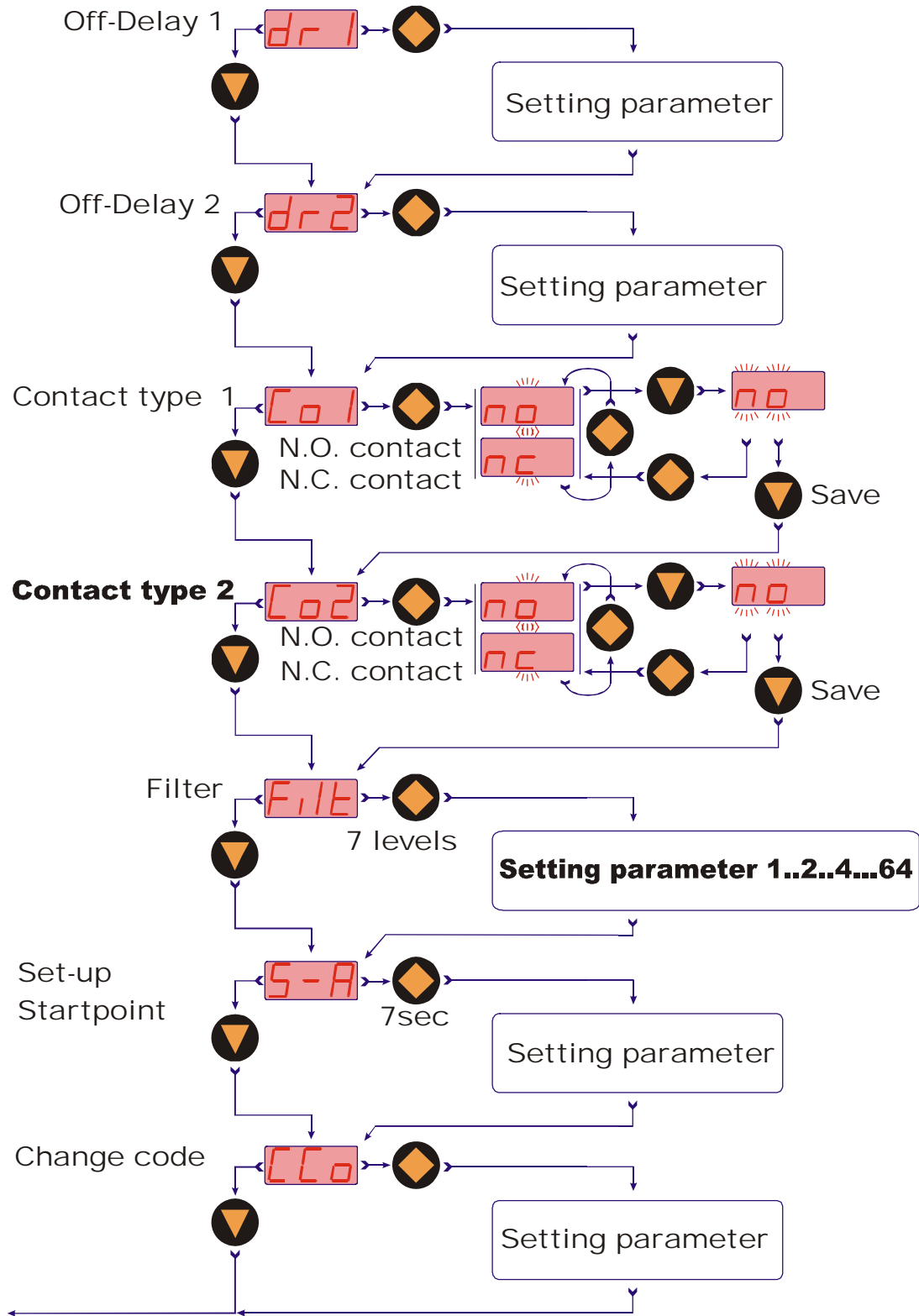
9.2. Set-up for PDD-1x and PDD-2x





9.3. Set-up for PDD-5x and PDD-7x





10. Main Menu Options

10.1. Switch point

In menu option "SPo", "SP1", "SP2" the switch point can be set. A value between -199 and 999 can be selected. Additionally, a decimal place can be assigned to this value. The decimal point can be set after the first or the second place (e.g. 10.0 or 1.00). If the displayed value exceeds or equals the adjusted switch point and the window point is not set, then the switch will be active. An active switch is signalled by the LED being lit.

In case the hysteresis is set to zero, then the switch will be inactive if the value is lower than the switch point.

10.2. Hysteresis

After setting the switch point, a hysteresis "HYS", "HYS1", "HYS2", can be entered as a negative value in the menu. The hysteresis default value is zero. However, this can lead to an unwished switching behaviour during the operation, if the measuring signal keeps varying around the switch point or the window point. An increase in hysteresis will suppress the effect. The hysteresis refers to both the switch point and the window point (switch point minus hysteresis, window point plus hysteresis).

Example: Switch point:: 100 bar; Hysteresis: -2.5 bar

The switch will become active at and above 100 bar when the indicated value goes up, and will become inactive at 97.5 bar when the value goes down.

10.3. Window point (Duo point) (only PDD-1 and PDD-2)

Apart from the switch point, a window point ("duo") can be defined. It must be larger than the switch point. With both the "window point" and the "switch point" set, the measured value can be monitored within a certain range. If a window point is set, the state of the switch underneath the switch point is similar to the one above the window point.



If the window point (duo) is smaller or equal to the switch point, an error message (Er4) is momentarily displayed, afterwards its value is deleted and thus its function becomes ineffective (this is valid for the window point as well as for the switch point setting).

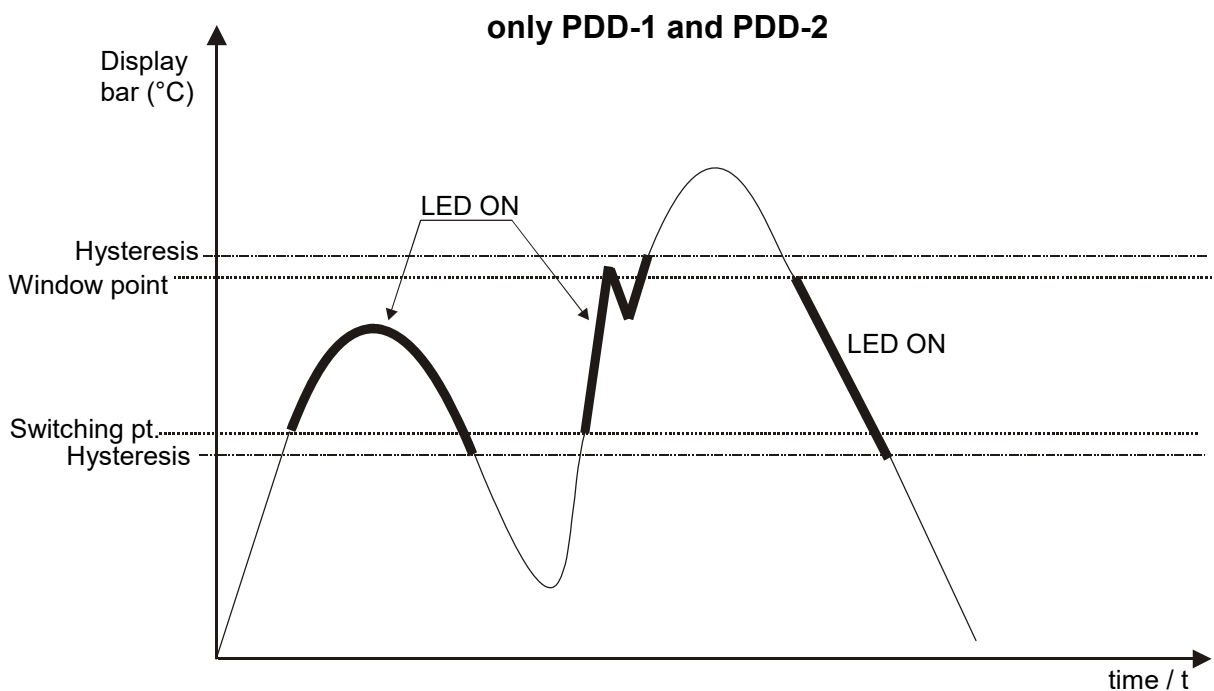
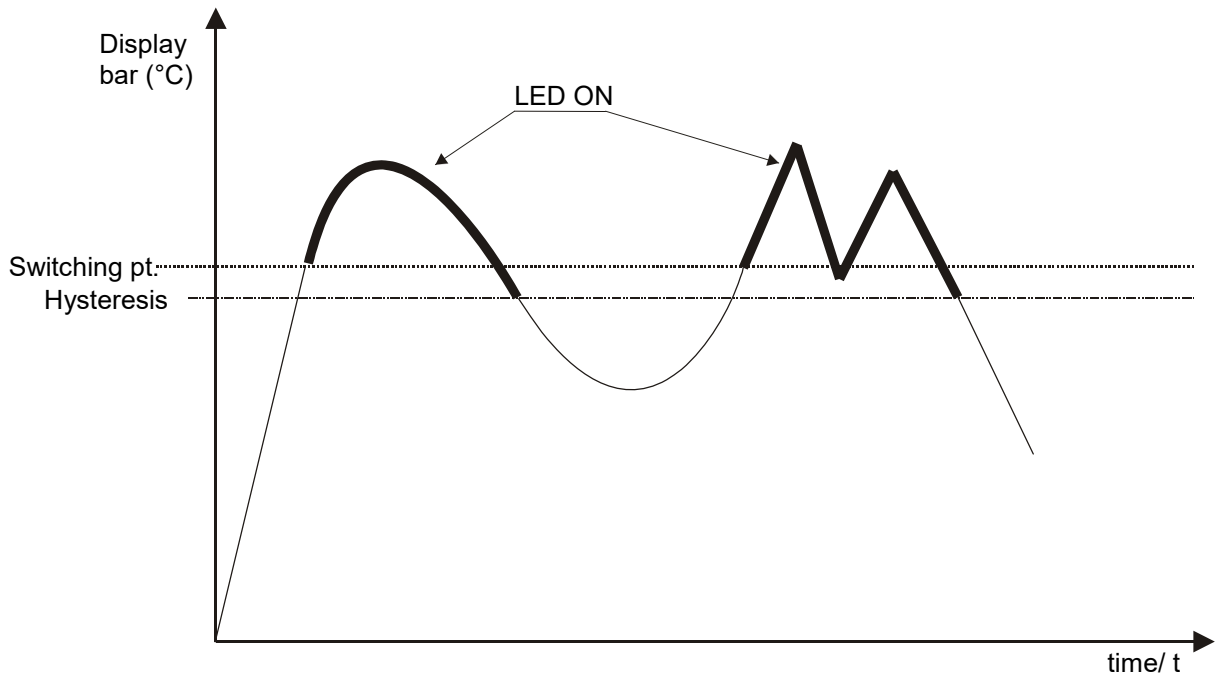
This parameter setting is similar to the switch point setting. The window point is needed for processes, during which the pressure must be monitored within or outside a certain range.

Example: Switch point: 100 bar; Window point: 150 bar; Hysteresis: -1 bar

The switch changes state when pressure exceeds 100 bar. At this moment, if the pressure remains between 99 (100-1) bar and 151 (150+1) bar, the switch remains in the active state (LED on). If the pressure increases crossing 151 bar limit or (decreases to go below 99 bar limit), the switch will revert to an inactive state.

10.4. Switching behaviour

The following diagram clarifies the switching behaviour of the pressure switch. The contact closes (type of contact: N.O.) when exceeding the switch point or falling short of the window point. It opens only again after exceeding the window point plus the hysteresis or falling below the switch point minus the hysteresis. An LED signals the switching status of the pressure switch.



10.5. Filter

The filter function "**Filt**" forms a running average from the measured values. The following values can be set (see section 8; set up):

1 / 2 / 4 / 8 / 16 / 32 / 64

They correspond to the number of samples used in the running average. The filter value determines the dynamic behaviour of the display value. The larger the adjusted value, the slower the display response. With a filter value of "1" the filter is switched off, i.e. the display value is equal to the unfiltered measured value.

The integrated step function detector reacts to a change of value corresponding to approx. 6.25% of the full scale value. As soon as a step function signal is detected, the instantaneous measured value is directly indicated in the display.

10.6. Time response

Using the menu items "**dS1**", "**dS2**", "**dr1**" and "**dr2**" (**PDD –5/7 and respectively "dSE" and "drE" (PDD- 1/2)**) it is possible to set the switch-on-delay (delay set) and the switch-off-delay (delay reset).

The delay set causes delayed switching of the output if the switching point is exceeded.

The delay reset causes a delayed resetting of the output when falling short of the switching point – hysteresis.

The setting range for both parameters is 0.0 ... 99.5 seconds. The step rate is 0.5 seconds.

With these two functions it is also possible to suppress temporary disturbances.

10.7. Contact type

In menu option "**Con**", "**Co1**", "**Co2**" the transistor switching output function is set. The switching function changes from

N.O. contact

to

N.C. contact, and back.

N.O. contact means: Contact closes on exceeding the switch point.

N.C. contact means: Contact opens on exceeding the switch point.

10.8. Set-up start point

In a state of no pressure, a new **Zero-point** is calibrated in menu option "**S-A**". For security reasons, the user must press and hold the "◆" key for 7 seconds, in order to set the parameter.

10.9. Code

The function "**CCO**" (change code) is used to protect the device against unauthorised changes to the other parameters. If the code is different from 000, the user must input the previously set code first in order to make any changes in the set up mode.

Please note that if the customer code has been lost, the unit has to be returned to the manufacturer for reprogramming.

11. Maintenance

The device is maintenance-free, when used as described under "Intended Application". Deposits, which develop by contaminated media, could lead to incorrect measured values.

12. Technical Information

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

13. Order Codes

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

14. Dimensions

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

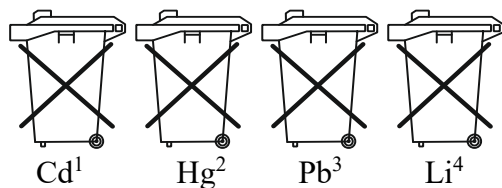
15. Disposal

Note!

- Avoid environmental damage caused by media-contaminated parts
- Dispose of the device and packaging in an environmentally friendly manner
- Comply with applicable national and international disposal regulations and environmental regulations.

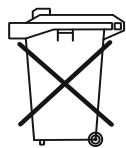
Batteries

Batteries containing pollutants are marked with a sign consisting of a crossed-out garbage can and the chemical symbol (Cd, Hg, Li or Pb) of the heavy metal that is decisive for the classification as containing pollutants:



1. „Cd" stands for cadmium
2. „Hg" stands for mercury
3. „Pb" stands for lead
4. „Li" stands for lithium

Electrical and electronic equipment



16. EU Declaration of Conformance

We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the product:

Electronic Pressure Switch model: PDD-1, PDD-2, PDD-5 and PDD-7

to which this declaration relates is in conformity with the following EU directives stated below:

2014/30/EU	EMC Directive
2011/65/EU	RoHS
2015/863/EU	Delegated Directive (RoHS III)

Also, the following standards are fulfilled:

EN IEC 61326-1:2021 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements, industrial area (measurement of immunity to HF field up to 1 GHz)

EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements

EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Hofheim, 26 Sept 2023



H. Volz
General Manager

J. Burke
Compliance Manager

17. UK Declaration of Conformity

We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the product:

Electronic Pressure Switch model: PDD-1, PDD-2, PDD-5 and PDD-7

to which this declaration relates is in conformity with the following UK directives stated below:

S.I. 2016/1091	Electromagnetic Compatibility Regulations 2016
S.I. 2012/3032	The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Also, the following standards are fulfilled:

BS EN IEC 61326-1:2021

Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements, industrial area (measurement of immunity to HF field up to 1 GHz)

BS EN 61010-1:2010+A1:2019

Safety requirements for electrical equipment for measurement, control, and laboratory use. General requirements

BS EN IEC 63000:2018

Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.



Hofheim, 26 Sept 2023

H. Volz
General Manager

J. Burke
Compliance Manager