Operating Instructions

for

Pressure Transmitter

with Digital Display

Model: PDA



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2. Note

Please read these operating instructions before unpacking and putting the unit into operation. Follow the instruction 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.

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

2.1. Notes on the machine and pressure equipment directive

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:
- Pressure Transmitter with Digital Display model: PDA

4. Operating Principle

KOBOLD pressure indicator/transmitter series PDA are cost effective electronic pressure indicator/transmitters with digital indication of actual pressure.
An analogue output (0)4-20 mA is available for remote transmission of the measured value. The device is optionally available in addition with a switching output.

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

5. Regulation Use

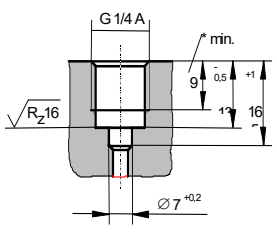
Pressure transmitters are used to measure pressure in vessels, hydraulic and pneumatic plant, refrigeration equipment and so forth.

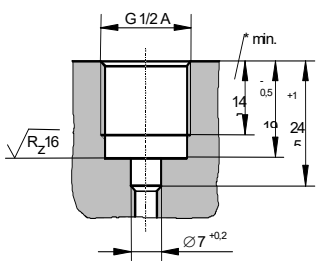
The devices may only be used for liquids to which the probe and housing materials are chemically resistant.

6. Mechanical Connection

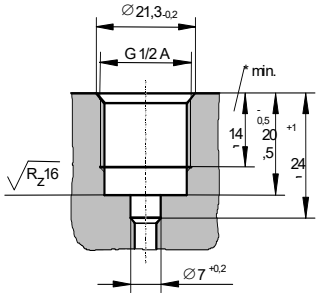
Pressure taps should be prepared according to the following specifications for the screw-in holes.
Gaskets to DIN 16 258 or formed gaskets are recommended for sealing British Standard Parallel Pipe thread (BSPP). The required tightening torque depends on the material and shape of the gasket used, and on the pressure port in the pressure sensor. National Pipe Thread (NPT) fittings should be sealed with an appropriate pipe thread sealant. Exposure to violent shocks and heat radiation should be avoided.
The permissible service conditions for the pressure sensors should be observed.
When the pressure connection has been made and the power supply connected, the sensor is ready for operation.

Sealing according DIN 16288





Sealing with Flat gasket



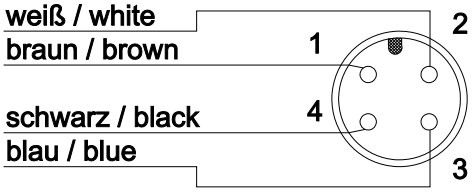
7. Electrical Connection

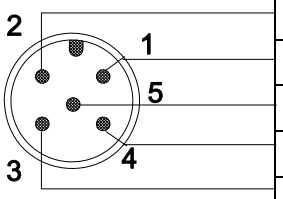
Important! Make sure that the voltages in your plant correspond with the voltages on the nameplate.

- Make sure that the electrical supply lines are dead.
- The supply is connected through connector socket M12x1 as shown in the wiring diagram below.
- Mating plugs with different cable lengths are available as options.

Important! The instrument electronics may be damaged if the cable connections are connected incorrectly.

7.1. Connector pin assignment PDA-15...



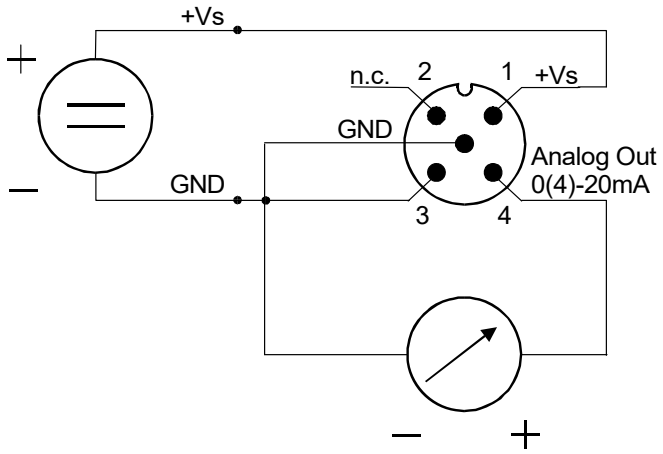


PDA-15
Not connected
+Vs/+ Supply
0 V / GND
Output
0 V / GND

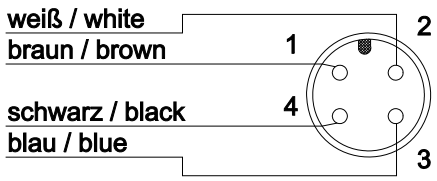
Option:
Plug with cable ZUB-KAB-12K002 **Plug**

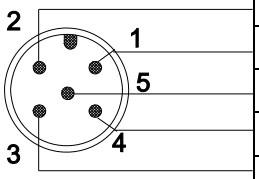
Connection example

PDA-15
Pin M12



7.2. Connector pin assignment PDA-25, PDA-35…

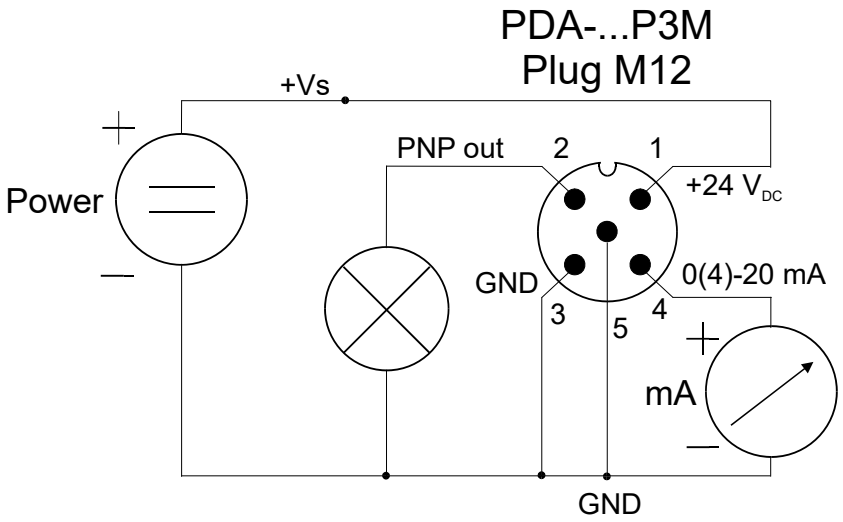




PDA-25...	PDA-35...
PNP-Output	NPN-Output
+24 V_{DC}	+24 V_{DC}
0 V / GND	0 V / GND
0(4)-20 mA	0(4)-20 mA
0 V / GND	0 V / GND

Option:
Plug with cable ZUB-KAB-12K002 **Plug**

Connection example



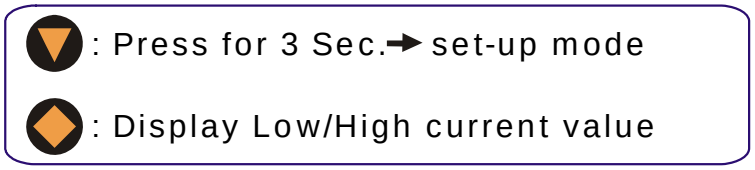
8. Commissioning

Caution! Please note that if operated at high system temperatures the case surface and controls can become very hot.

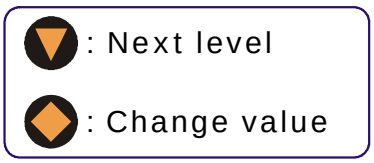
Connect the pressure transmitter according to the wiring diagram above and supply it with the specified voltage.
The measuring range (upper range value) is displayed for 3 seconds after switch on.

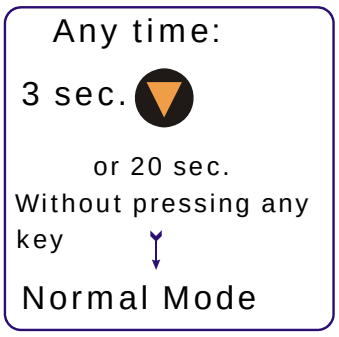
8.1. Key function

Normal mode (measuring mode)



Set-up mode





9. Configuration

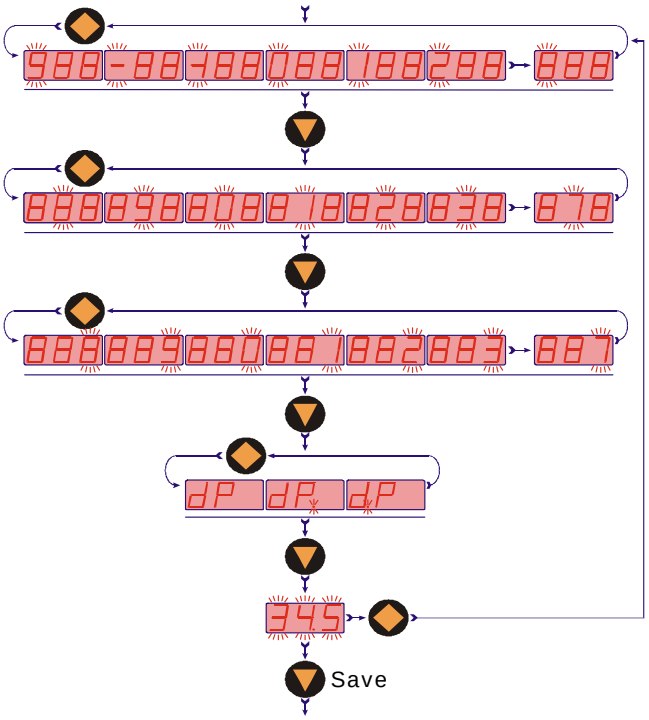
The following values can be programmed on the pressure transmitter:

	Range of values	**Factory setting**
Switch point **(Spo)**	-199…999	50,0
Hysteresis **(HYS)**	-199…0	000
Duo point **(duo)**	Switch point…999	--- (inactive)
Filter **(Filt)**	1/2/4/8/16/32/64	1
Time response **(dSE, drE)**	0,0…99,5 sec.	0,0
Contact-type **(Con)**	Normally open contact (no) or normally closed contact (nc)	no (normally open contact)
Start current (**S-C**) zero	0 to upper range value	0
End current (**E-C**) span	0 to upper range value	upper range value
Start current selection (**SCS**)	0 / 4 mA	4
Filter (**Filt**)	1/2/4/8/16/32/64	1
Start adjustment (**S-A**,) tare	000	adjusted
Change Code (**CCo**,)	000 - 999	000

9.1. Value setting

Value setting can be selected with the "◆" key in the main menu item (for example: End current, "**E-C**"). The standard sequence for changing parameters is given in the flowchart below.

[from the main menu item]



Set 1st position

Set 2nd position

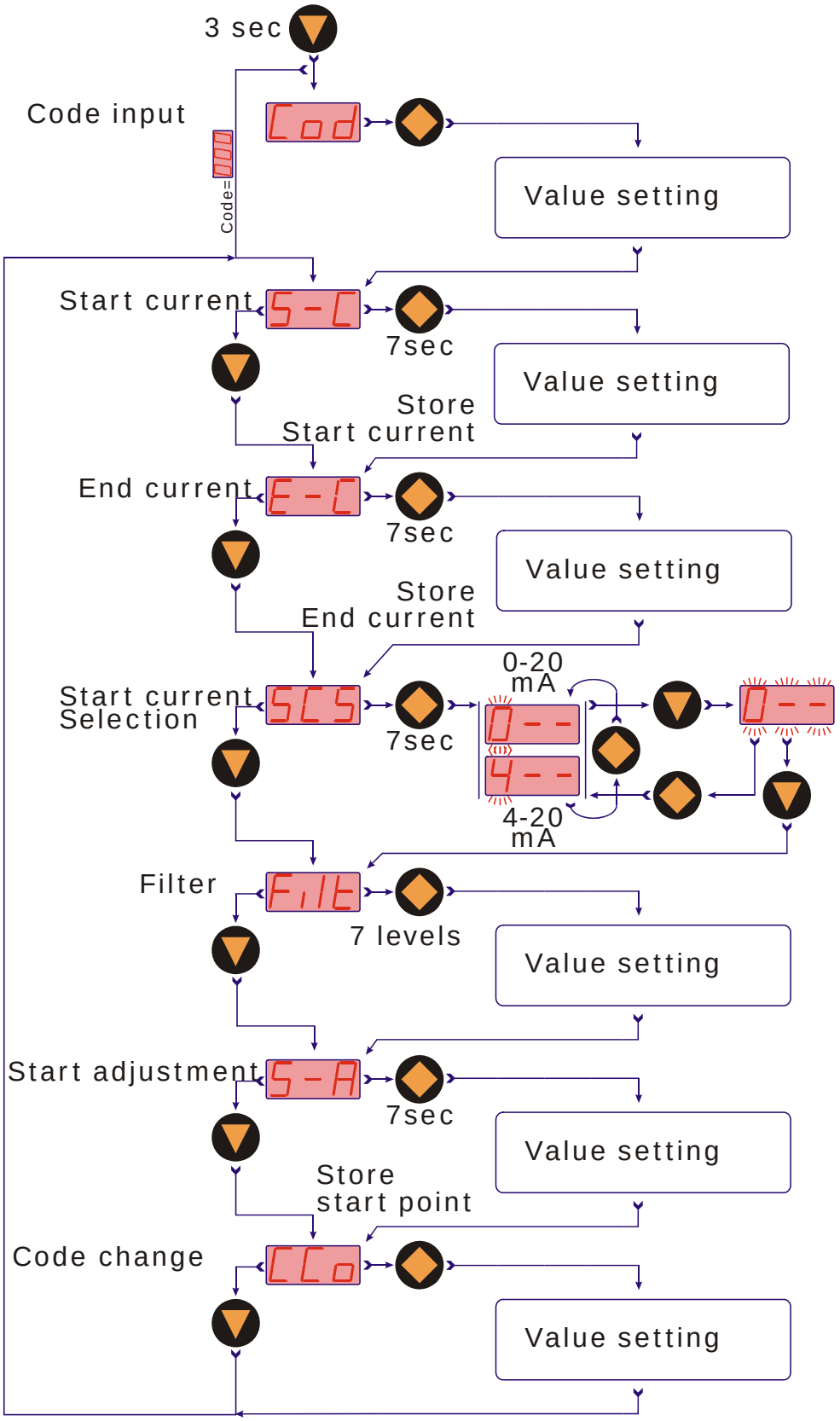
Set 3rd position

Adjust decimal point

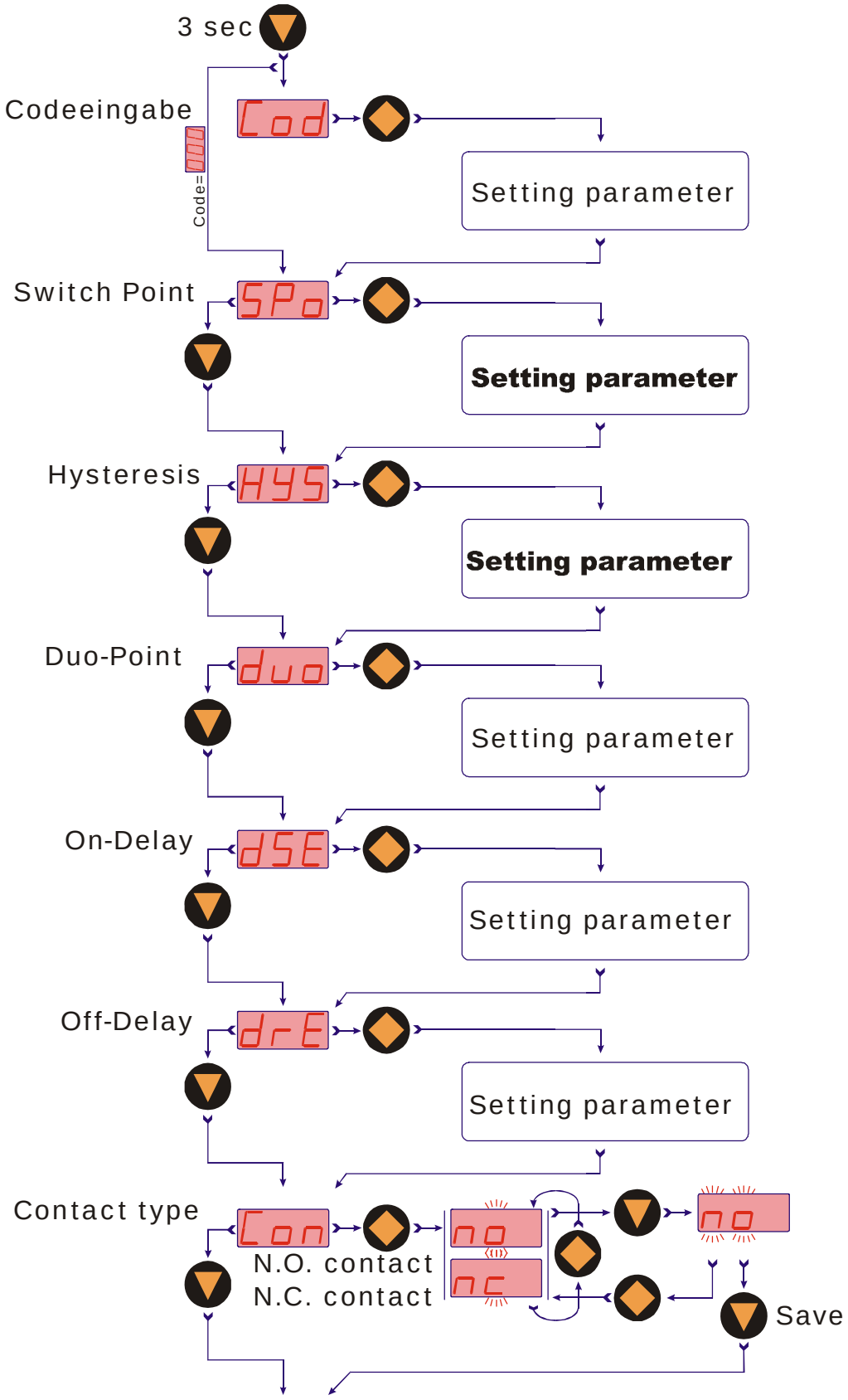
Save selected value or re-enter

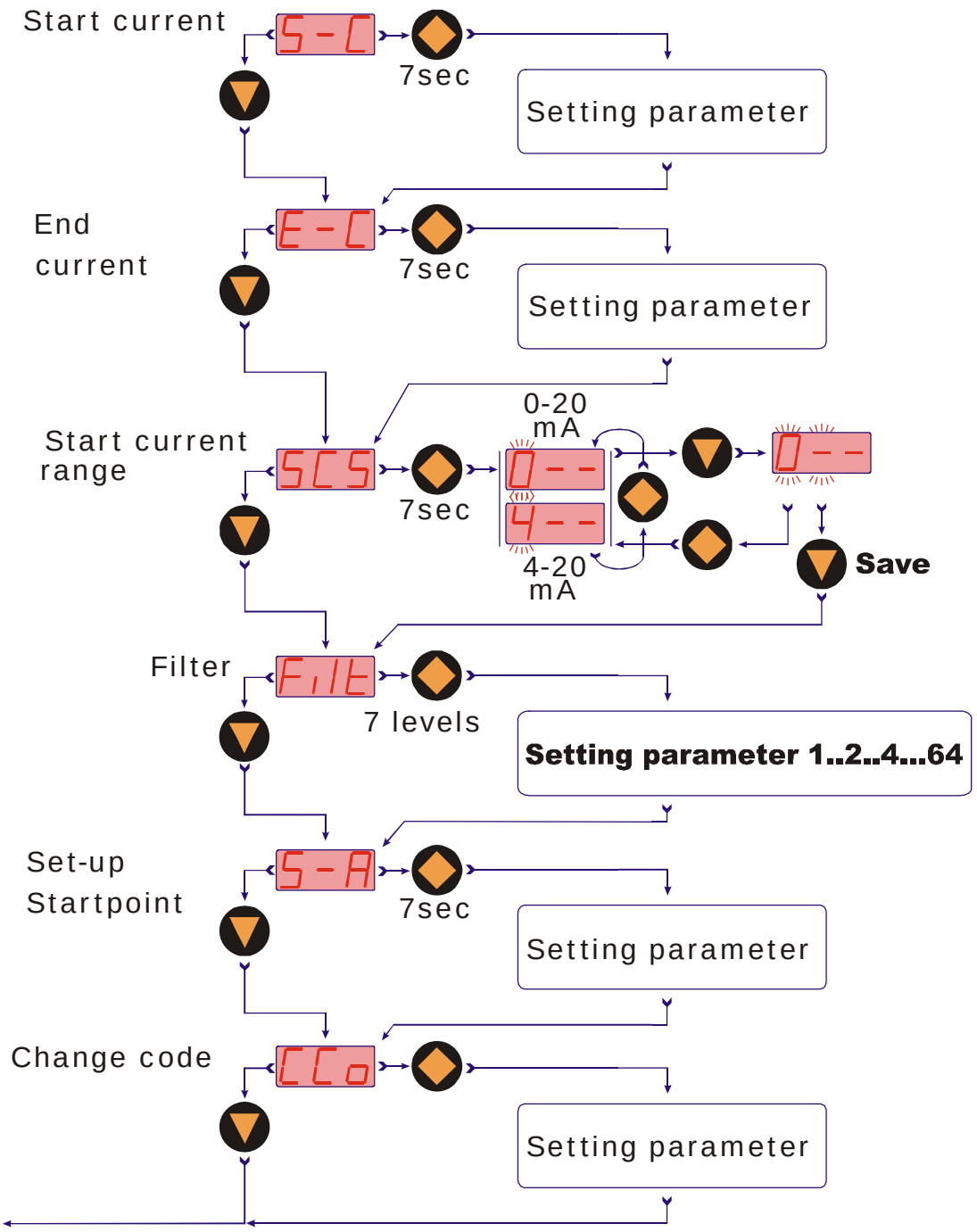
[to the next main menu item]

9.2. Set-up mode for PDA-15



9.3. Set-up mode for PDA-25 and PDA-35




Start current
S-C
7sec
Setting parameter
End
current
E-C
7sec
Setting parameter
Start current
range
SCS
7sec
0-20
mA
0--
4--
4-20
mA
0--
Save
Filter
FiLt
7 levels
Setting parameter 1..2..4...64
Set-up
Startpoint
S-A
7sec
Setting parameter
Change code
CCo
Setting parameter

10. Main Menu Items

10.1. Switching point

In menu option, "**SPo**" 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**" 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. Duo point

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.



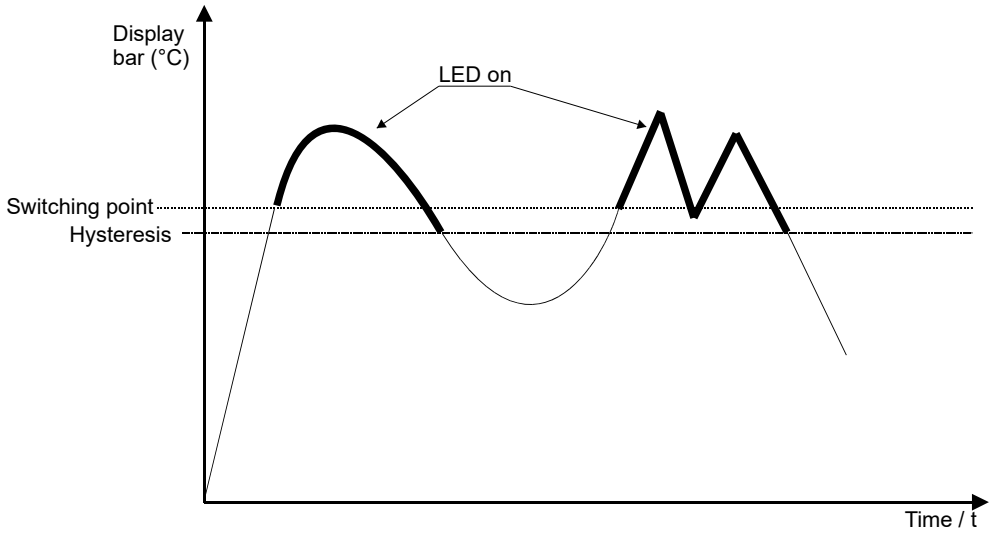
If the window point (duo) is smaller or equal to the switch point, an error message (Er4) is momentarily displayed. Afterwards its value is deleted and thus its function becomes ineffective (this is valid for the window point as well as for the switch point setting).

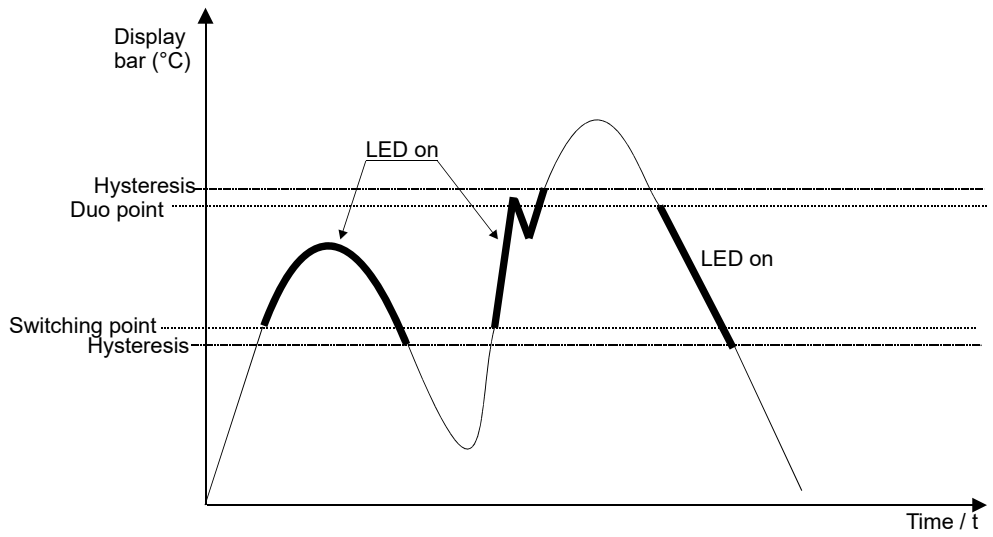
This parameter setting is similar to the switch point setting. The window point is needed for processes, during which the pressure must be monitored within or outside a certain range.

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 characteristic

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 again only 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. Time response

Using the menu items **“dSE”, “drE”** 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.

10.6. Contact-type

In menu option "**Con**", 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.

10.7. Current output

The current output is set in menu items

"**S-C**" Start current indicated value < > 0(4) mA
"**E-C**" End current indicated value < > 20 mA
"**SCS**" Start current selection (0-20 mA or 4-20 mA).

The indicated value at which 0(4) mA is transmitted is entered in menu item Start current. The indicated value at which 20 mA is transmitted is entered in the menu item End current.

10.8. Filter

The filter function "**Filt**" generates the sliding average value from the measured values. This acts to dampen the output in a system that has pressure pulsations. The following values are available (see Section 9 Settings):

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

The filter value determines the dynamic behaviour of the indicated value: high values mean a slow display with smoother response. The filter is disabled if a filter value of "1" is selected. In other words, the indicated value is equal to the unfiltered measured value (no dampening occurs).

The integrated step detector responds to a measured-value step change greater than approximately 6.25% of the upper range value. When a measured-value step change is detected, the actual measured value is displayed immediately.

10.9. Start adjustment

The **zero-point** can be recalibrated when the sensor is in the unpressurised state. As a security precaution, the operator must press and hold the "◆" key for 7 seconds. This must be done before he can activate the value setting menu item "**S-A**".

10.10. Change Code

Change code "**CCo**" protects the device against unauthorised changing of the set device parameters by allowing the operator to enter a secret code. If the code set is different then 000, the operator must enter the set code "**Cod**" before entering the set-up mode.

11. Maintenance

The instrument requires no maintenance when properly used. Deposits, due to fouled media, can give rise to invalid 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

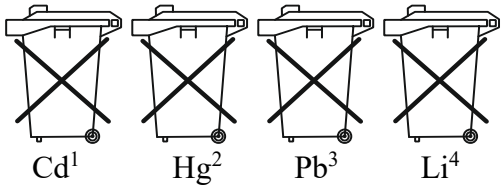
15. Disposal

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, Hofheim-Ts, Germany, declare under our sole responsibility that the product

Pressure Transmitter with Digital Display model PDA

to which this declaration relates is in conformity with the standards noted below:

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

Also, the following EU guideline is fulfilled:

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

Hofheim, 08 May 2023

H. Volz
General Manager

M. Wenzel
Proxy Holder

17. UK Declaration of Conformity

We, KOBOLD Messring GmbH, Hofheim-Ts, Germany, declare under our sole responsibility that the product:

Pressure Transmitter with Digital Display model PDA

to which this declaration relates is in conformity with the standards noted below:

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.

Also, the following UK guidelines are fulfilled:

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

Hofheim, 08 May 2023

H. Volz
General Manager

M. Wenzel
Proxy Holder