



Operating Instructions for Compact Vortex Flow Meter

Model: DVZ



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Manufactured and sold by:

Kobold Messring GmbH
Nordring 22-24
D-65719 Hofheim
Tel.: +49(0)6192-2990
Fax: +49(0)6192-23398
E-Mail: info.de@kobold.com
Internet: www.kobold.com

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.

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

as per PED 2014/68/EU

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

Diagram 8, Pipelines, Group 1, dangerous fluids

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:

- Compact Vortex Flow Meter model: DVZ

4. Regulation Use

Any use of the Compact Vortex flow meter, model: DVZ, which exceeds the manufacturer's specifications, may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

5. Operating Principle

The compact KOBOLD Vortex flow meter, model DVZ, is used for measuring and monitoring smaller and medium-sized flow of low viscosity, water-like fluids in pipes.

The device works using the vortex process, making it virtually maintenance-free. This involves the installation of a sharp-edged object (the vortex generator) in the flow duct. A vortex is created behind the object whose frequency is proportional to the flow velocity of the fluid.

The flow volume can be determined with a very great degree of accuracy by measuring the vortex frequency. This achieves a very high linearity across the whole measuring range.

The device can be fitted with switching, frequency or analogue outputs. There is also an optional compact electronics package that includes a digital display, and both a switching and analogue output.

6. Mechanical Connection

6.1 Check operating conditions:

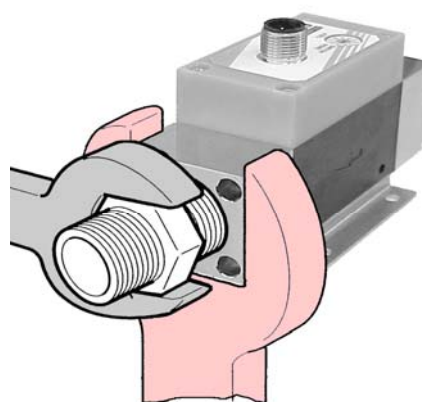
- Flow rate
- max. operating pressure
- max. operating temperature

6.2 Installation

- Remove all packing materials and transport retainers and ensure that no such materials remain in the device.
- Install with flow in direction of arrow (universal mounting)
- Avoid pressure and radial tension
- Fasten the pipe at up stream and down stream at a distance of 50 mm from the connections



Attention! Retransfer the unit on the metal bolting (not on the plastic housing!) Mount switches using the proper tightening torque according the following table!



Nominal size of threads	Proper tightening torque
3/8"	22 to 24 Nm
1/2"	28 to 30 Nm
3/4"	28 to 30 Nm
1"	36 to 38 Nm



Note! The switch may be damaged if it is tightened above the tightening torque range. Also, if it is tightened below the tightening torque range, the connecting thread section may loosen.

- Ensure inlet section of 10xDN and outlet section of 10xDN
- Avoid valves or large reduction on the inlet section (this increases the inaccuracy of measurements)
- Check the seals of the connections



Attention! When used with an open output side, there is a danger of cavitation.

7. Electrical Connection

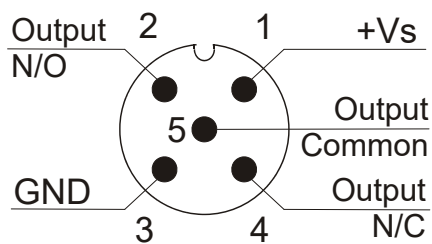
7.1 General



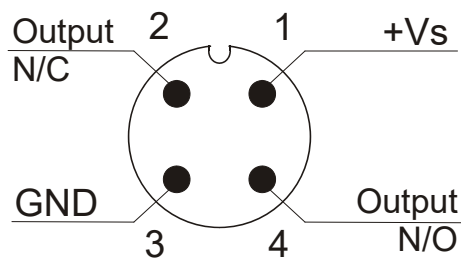
Attention! Make sure that the voltage values of your system correspond with the voltage values of the measuring unit.

- Make sure that the supply wires are de-energised.
- Connect the supply voltage and the output signal **to the plug PIN's as stated below.**
- We recommend the use of wires with cross sectional area of min. 0,25 mm².

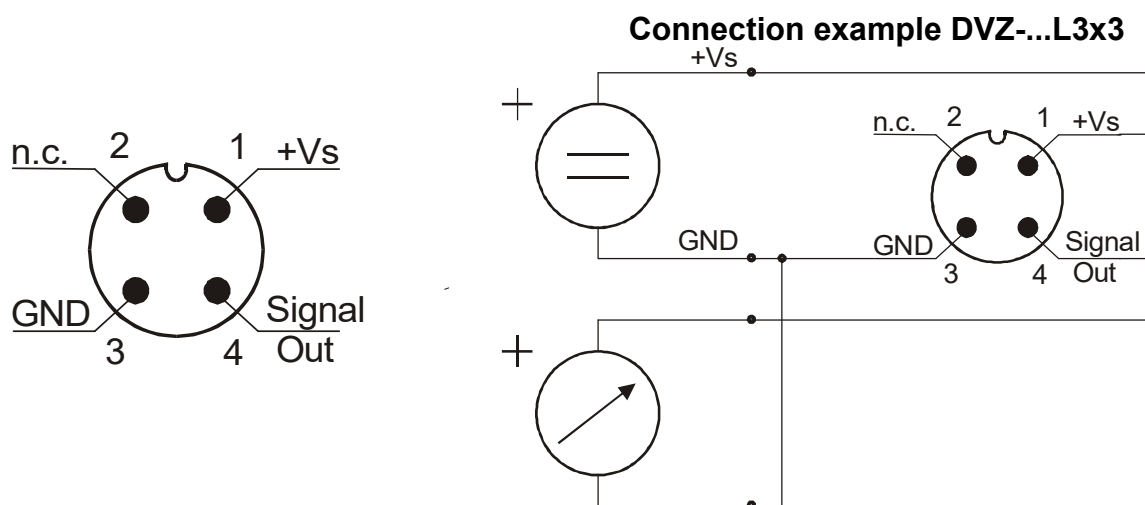
7.2 DVZ-...S300



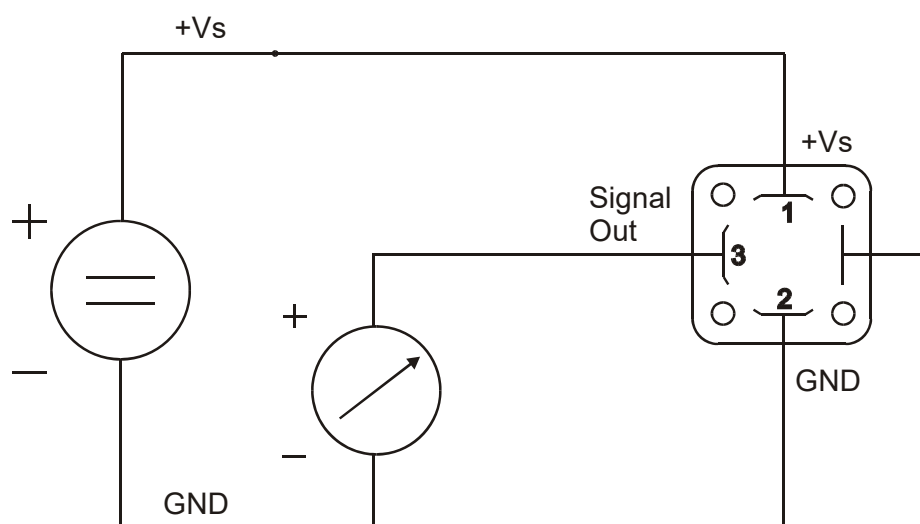
7.3 DVZ-...S30D



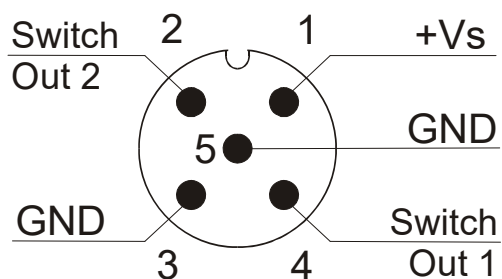
7.4 DVZ-...F300; DVZ-...L3x3



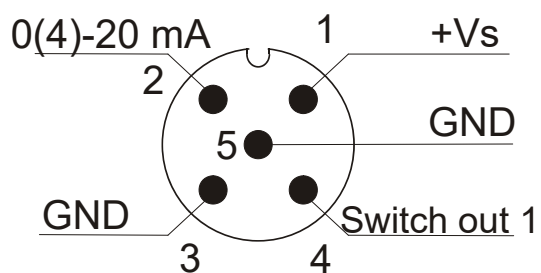
7.5 DVZ-...L443



7.6 DVZ-...C30



7.7 DVZ-...C34



7.8 DVZ-...Ex4R, DVZ-...Gx4R

Cable connection

Wire number	DVZ-...E14R Counter electronics	DVZ-...G14R Dosing electronics
1	+24 V _{DC}	+24 V _{DC}
2	GND	GND
3	4-20 mA	4-20 mA
4	GND	GND
5	n. c.	control 2*
6	reset part quantity	control 1*
7	relay S1	relay S1
8	normally open	normally open
9	relay S2	relay S2
10	normally open	normally open

*Start-dosing: Control 1 connect with GND

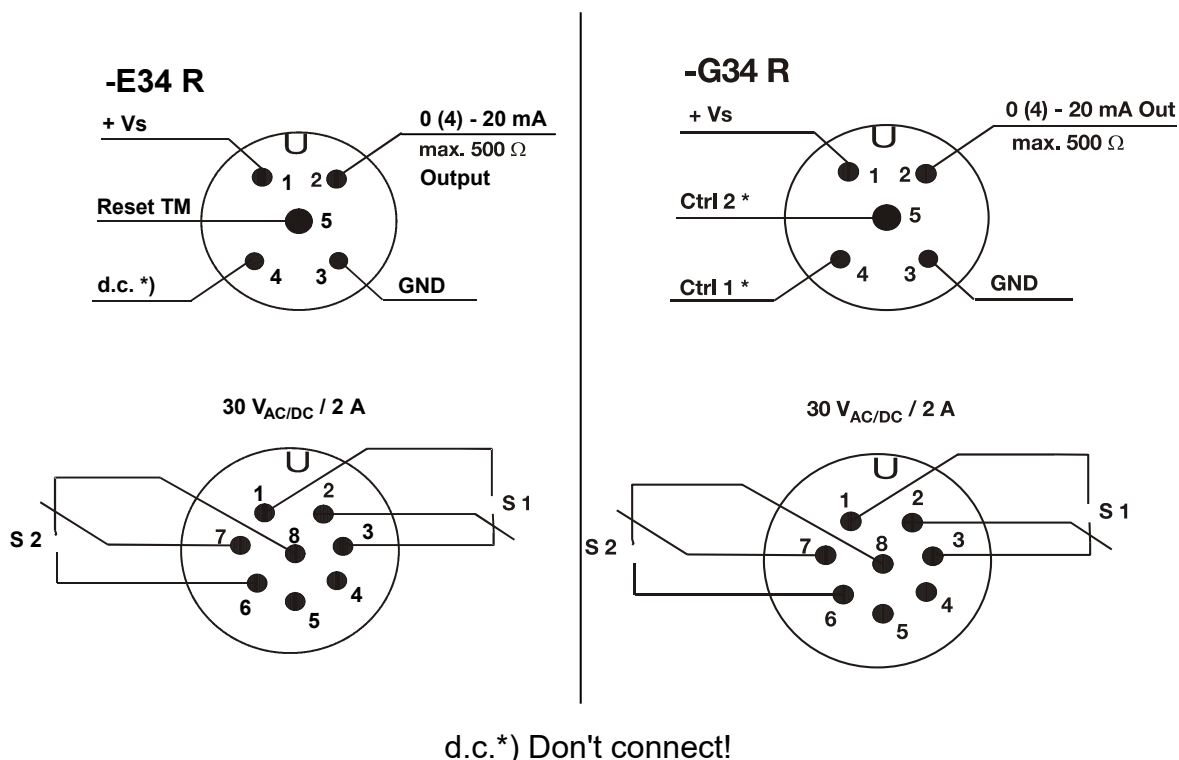
Stop-dosing: Control 2 connect with GND

Reset-dosing: Control 1 and Control 2 at the same time with GND



Do not connect any external voltage to the control units!

Plug connection



8. Operation

The units are preset and after electrical connection ready for operation.

8.1 Switch point setting DVZ-...S300, DVZ-...S30D

Switch setting	Switch point
0	switch function deactivated
1	start of measuring range
2	20% of f.s.
3	30% of f.s.
4	40% of f.s.
5	50% of f.s.
6	60% of f.s.
7	70% of f.s.
8	80% of f.s.
9	90% of f.s.

Flow above switch point: DUO-LED green

Flow below switch point: DUO-LED red

Measuring range overflow: DUO-LED orange flashing

8.2 Counter electronics DVZ-...Ex4R

Operating please see Operating Instructions ZED-Z

8.3 Dosing electronics DVZ-...Gx4R


Operating please see Operating Instructions ZED-D


9. Adjustments – Compact Electronic DVZ-...C3..

Connect the compact electronic according to previous connection diagram. After power on, the measuring range (end current) will be shown for 3 seconds.


9.1 Button function


In the normal mode (measuring mode)

 : Press 3 sec. ➔ Setup mode


 : Switch point/Window point

In the set-up mode

 : Next Step

 : Change Value

Any time

3 sec


or do not press
a button for 20 sec

↓

Standard mode

9.2 Settings

The following values can be changed in the compact electronics:

	Scale range	Factory setting
Switch point (SPo , SP1 , SP2)	0...999	0,00
Hysteresis (HYS)	-199...0	-0,00
Window point (duo point) (duo)	Switch point ...999	--- (inactive)
contact-type (Con , Co1 , Co2)	N/O, N/C or Frequency (Fr)**	N/O
Start current (S-C)*	000...999	000
End current (E-C)*	000...999	f.s.
Start current selection (SCS)	0-- (0 mA), 4-- (4 mA)	4 mA
Change Code (CCo)	000...999	000

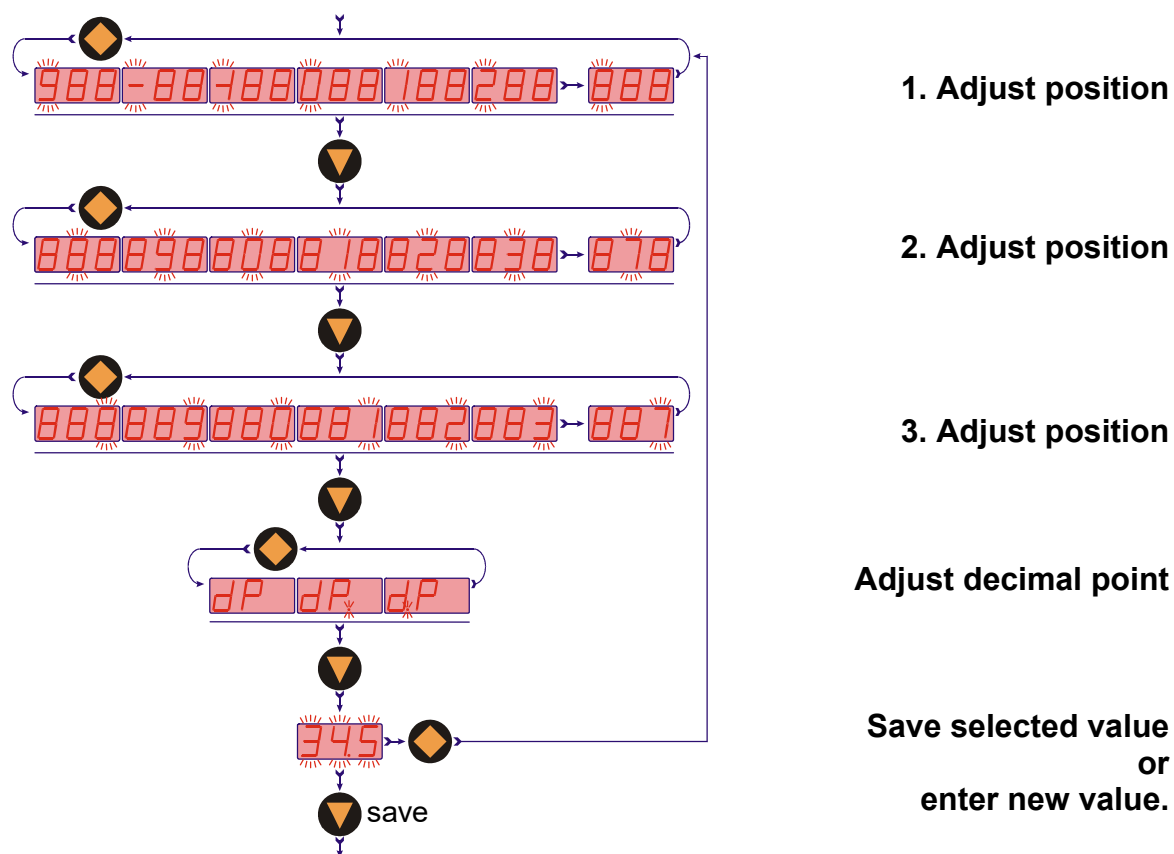
* Start- and end value of flow relating to 0/4-20 mA.

** **not calibrated**, frequency at f.s. approx. 500 -600Hz

9.3 Value setting

From the main menu item (for example: switch point, "SPo"), press the "◆" button to set the value. The flow chart below illustrates the universal routine for changing individual parameters.

[From the main menu item]

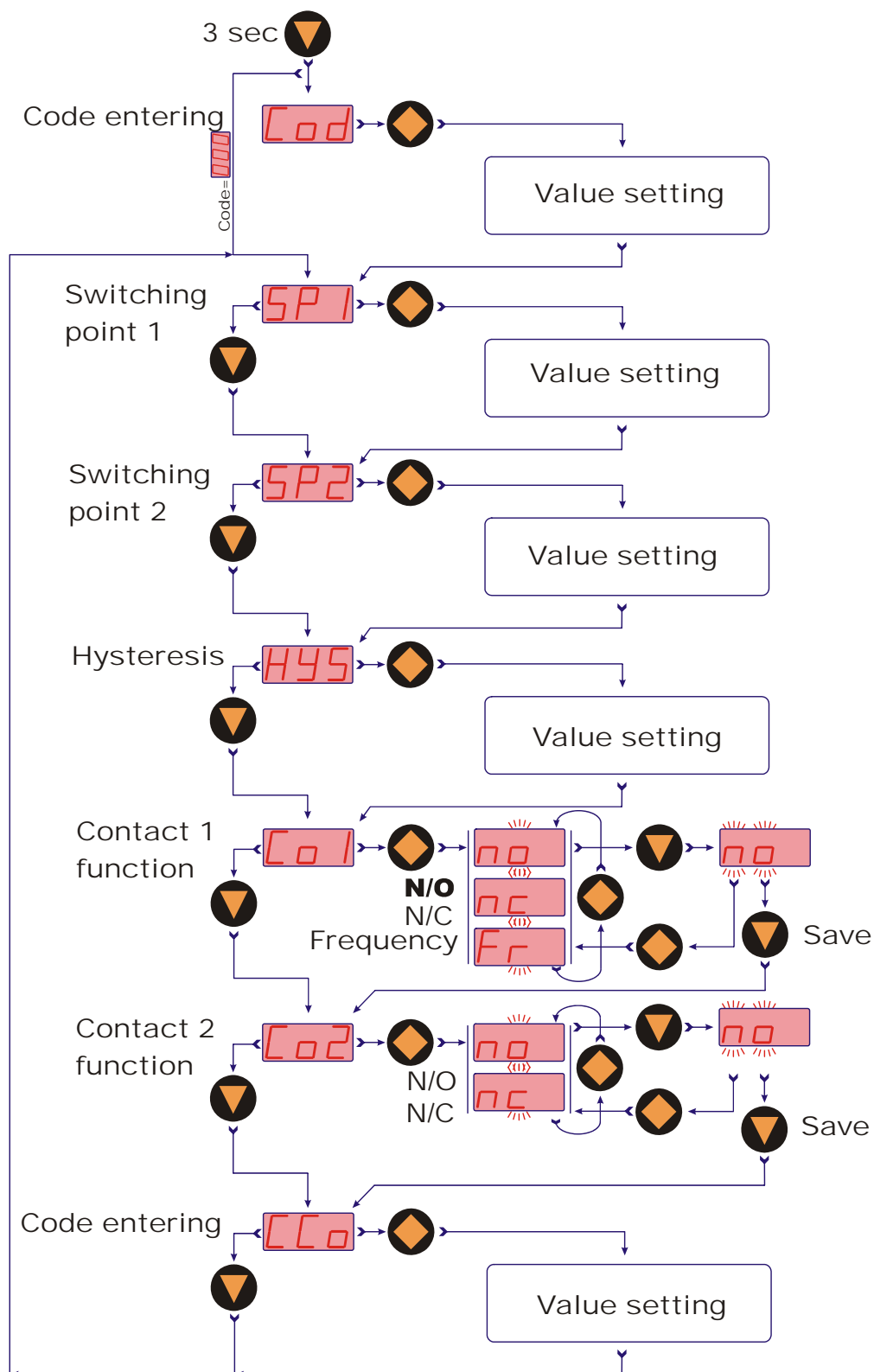


item]

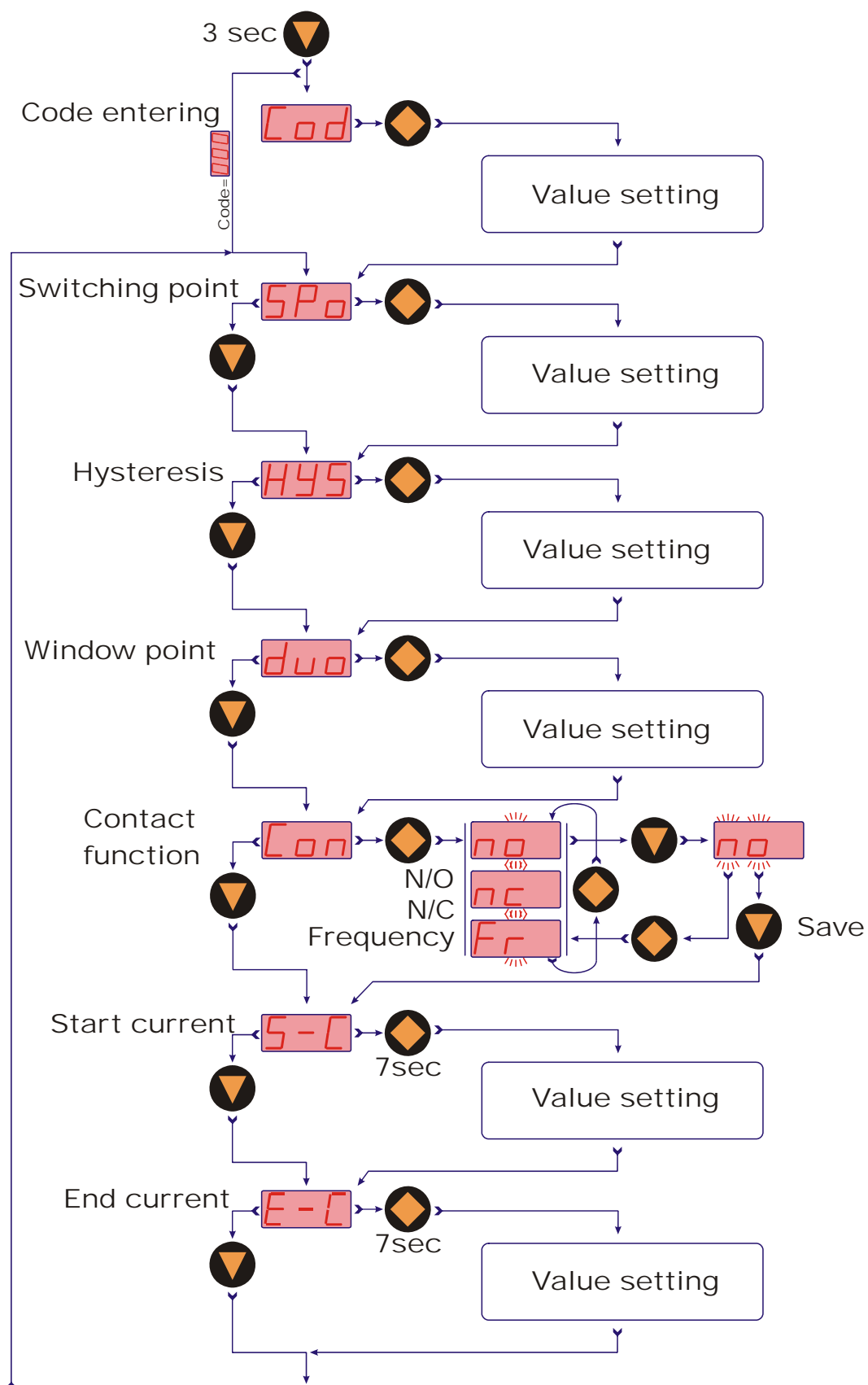
[To the next main menu

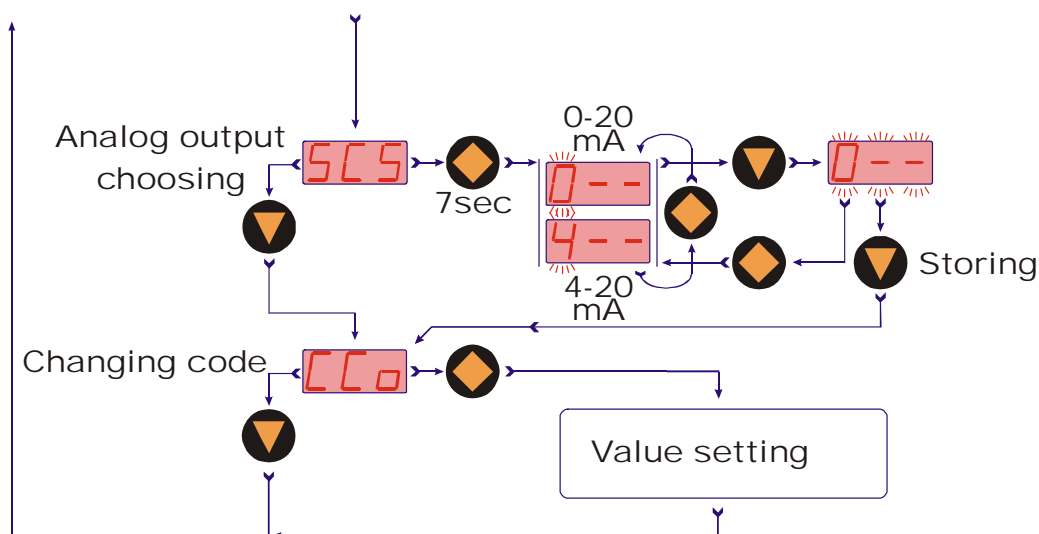
9.4 Set-up mode

Compact electronic DVZ-...C30..



Compact electronic DVZ-...C34





9.5 Main menu items

9.5.1 Switching point

The switching point is entered in the menu item "**Spo, SP1, SP2**". A setting value between 000 and 999 can be selected. This value can also include a decimal point. The decimal point can be set at two points (e.g. 10.0 or 1.00). If the display value exceeds the set switch point, the electronic is activated and is signalled by a lightning LED.

If the hysteresis is equal to zero and the window point is de-activated, the electronic switches back whenever the indicated value falls below the switching point.

9.5.2 Hysteresis

After the setting of the switching point, the hysteresis can be entered as a negative value in the "**HYS**" menu. The standard hysteresis value is zero. In operation condition this can lead to ambiguous switching behaviour, if the reading fluctuates around the switching point or window point. In this case, increasing the hysteresis can put things right. The hysteresis relates to the switching point and the window point (switching point minus hysteresis; window point plus hysteresis).

Example: Switching point 100 l/min; Hysteresis: -2.5 l/min

The electronic switches when 100 l/min is exceeded and switches back when the reading drops below 97.5 l/min.

9.5.3 Window point (duo-point)

As well as the switching point, it is also to define a "**duo**" (duo-point), the window point. This must be higher than the switching point. By using the window point and the switching point it is possible to monitor the measurement value in a certain range. The switching point limits the measurement range to smaller values and the window point to larger values.



If the window point (duo-point) is less than or equal to the switching point, an error report (Er4) will be indicated on the display and its value is deleted and its function is invalid (in the case that the window point and switching point out of adjustment).

The value is set in the same way as the switching point.

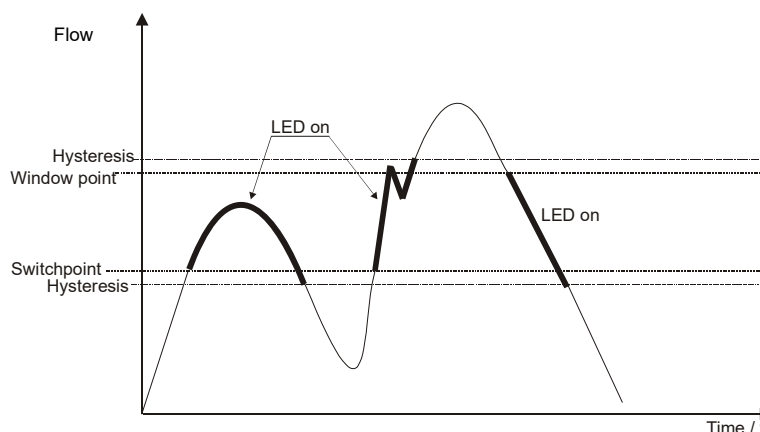
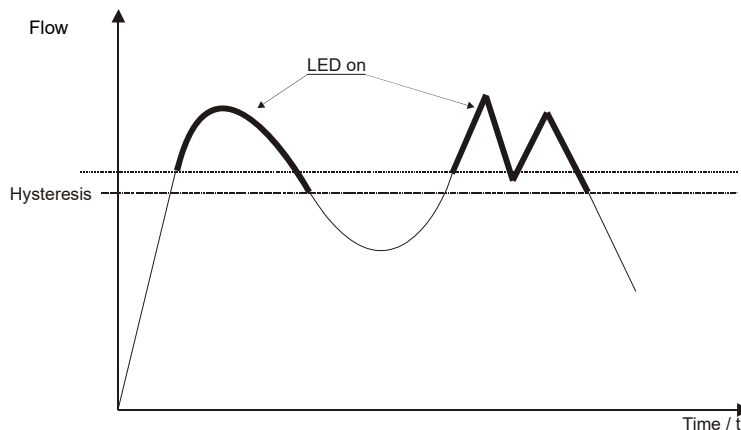
The window point is needed for process, in which monitoring of a certain temperature range is necessary.

Example: Switching point: 100 L/min; window point: 150 L/min; hysteresis: -1 L/min

The electronic switches when 100 l/min is exceeded. If the switching value remains between 99 L/min (100-1) and 151 L/min (150+1), the contact will also remain in active switching condition (LED on). If it exceeds 151 l/min or is below 99 l/min the electronic switches back.

Switching behaviour

The following diagram clarifies the switching behaviour of the electronic switch. The contact closes (contact type: no) when it drops below the switching point or the window point. It only opens again if the window point plus hysteresis is exceeded or if it drops below the switching point minus hysteresis. An **LED** indicates the switching condition of the switching point.



9.5.4 Contact type

The function of the transistor switching output is set in menu item "**Con, Co1 or Co2**". The switching function switches from

no - N/O contact to

nc - N/C to

Fr – frequency (only Con and Co1)
and back.

N/O contact: contact closes when switching point is exceeded

N/C contact: contact opens when switching point is exceeded

Frequency: frequency output synchronised with the vane frequency

9.5.5 Current output

The current output is selected 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 flow is entered in menu item Start current.

The indicated value at which 20 mA flow is entered in menu item End current.

9.5.6 Change Code

The change code option "**CCo**" secures the unit against unauthorised tampering. If the code is different from 000, the user must input the code immediately after entering the adjustment mode.

10. Maintenance

The measurement device requires no maintenance if the measurement medium does not cause deposits or include fibre parts, which wrap around the sensor or the gate. In order to avoid problems, we recommend the installation of a filter, such as the magnetic filter, type MFR.

If it is necessary to clean the sensor, the sensor can be rinsed with a suitable liquid. Fiber parts or large particles can be carefully removed with tweezers, etc.



Ensure that the sensor is not damaged.

Work on the electronics can only be performed by the factory, or the warranty is otherwise voided.

11. Technical Information

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

12. Order Codes

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

13. Dimensions

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

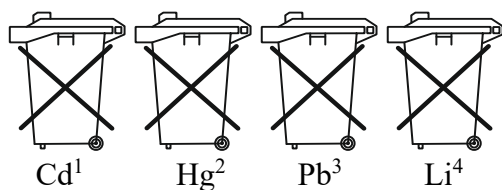
14. Disposal

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



15. EU Declaration of Conformity

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

Compact Vortex Flow Meter Model: DVZ

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

2014/30/EU	EMC Directive
2011/65/EU	RoHS (category 9)
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

Restriction: measurement of immunity to HF field with electronics options
L/F/S/K/E/G up to 1 GHz

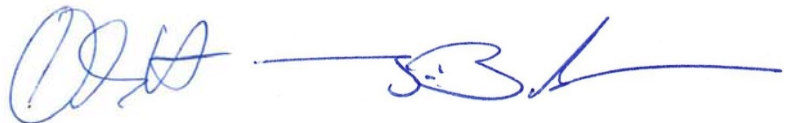
EN 60529:2014

Degrees of protection provided by enclosures (IP Code)

EN IEC 63000:2018

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

Hofheim, 25 Sept 2023



H. Volz
General Manager

J. Burke
Compliance Manager

16. UK Declaration of Conformity

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

Compact Vortex Flow Meter Model: DVZ

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

Restriction: measurement of immunity to HF field with electronics options L/F/S/K/E/G up to 1 GHz

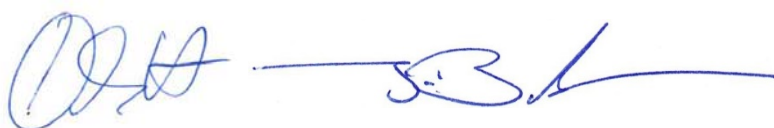
BS EN 60529:1992+A2:2013

Degrees of protection provided by enclosures (IP Code)

BS EN IEC 63000:2018

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

Hofheim, 25 Sept 2023



H. Volz
General Manager

J. Burke
Compliance Manager