

Operating Instructions for Piston Flow Meters

Model: DRZ



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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 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, Pipe, Group 1 dangerous fluids

3. Instrument Inspection

All 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:

- Piston Flow Meters model: DRZ
- Operating Instructions

4. Regulation Use

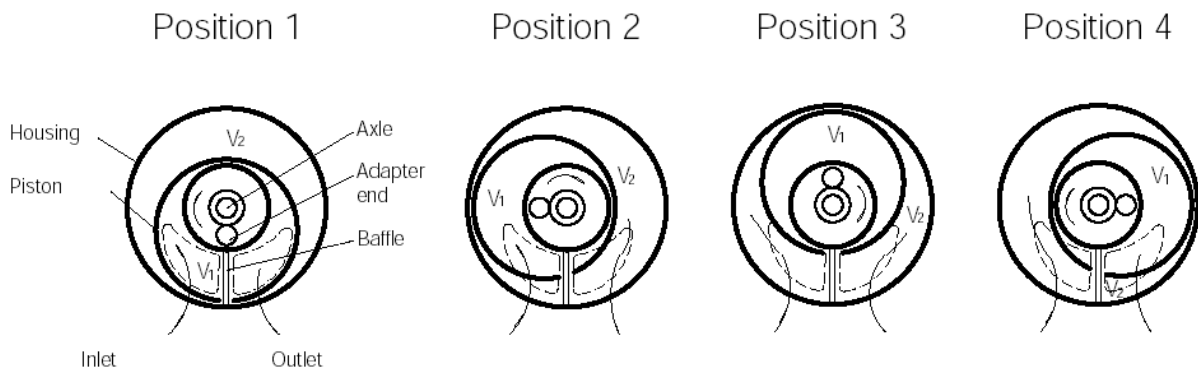
Any use of the Piston Flow Meters, model: DRZ, which exceeds the manufacturer's specification, may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

5. Operating Principle

KOBOLD Piston Flow Meters are direct volume counters, also called displacement counter (positive displacement meter).

Its function is based on continuous limitation of a definite part-volume of the flow in a measuring cell through continuous filling and emptying of this measuring cell. The measuring cell consists of the measuring chamber and the moving part, the piston.

The piston is driven by the pressure difference between inlet and outlet of the measured media. The counter is a pure mechanical instrument. The revolution is carried forward via a magnet and a magnet field sensor. In cross section the u-formed piston is guided with its piston and guiding-adapter in a ring chamber at the bottom and top of the measuring-body and with its slot at the baffle. The inlet and outlet openings are located on both sides of the chamber's wall. They are constantly sealed by the piston and the baffle. The incoming measured media fills up the sickle shaped spaces, it wants to increase these spaces and therefore turns the piston. Until one after the other the volumes V_1 and V_2 are reached. While moving ahead, these filled spaces are connected with the outlet and are emptied. Since both sickle shaped spaces - the inner and the outer - are displaced to one another, the piston movement will not have a dead centre. The piston moves continuously depending to the measured flow.



One complete turn of the piston adapter end is equal to the flow of the measuring chamber content (V_1+V_2). With the help of a located magnet and a Hall-type sensor, it is possible to create a digital signal, which can be evaluated.

6. Mechanical Connection

Before installation:

- Remove all packing materials, transport retainers and ensure that no such materials remain in the device.
- Make sure that the maximum operating pressure and temperature of the device are not exceeded.
- Please ascertain, that the pipe system is free of any welding bead, ferrite particles or other pollution.
- Make sure that the application flow amount corresponds with the flow range of the instruments.

Installation

- The mounting position of the piston is free of choice. The flow direction must be in the direction as indicated by the arrow.
- In- and outlet flow sections are not necessary.
- The sealing of the connection threads is done with sealing tape or something similar.
- During installation, please pay attention that the DRZ-instrument is not exposed to mechanical stress or tension. We recommend to mechanically fastening the connection pipes approximately 50 mm away from the connection thread.
- If possible, after completing the mechanical installation, check the thread connection between the device and the piping for leakage immediately.

7. Electrical Connection

7.1 General

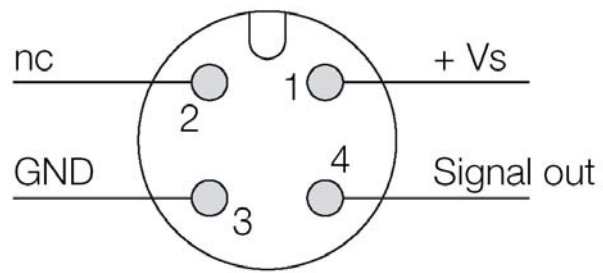
- Make sure that the supply wires are de-energised.
- Connect the power supply and the evaluation of the output signal to the pins of the plug described as follows.



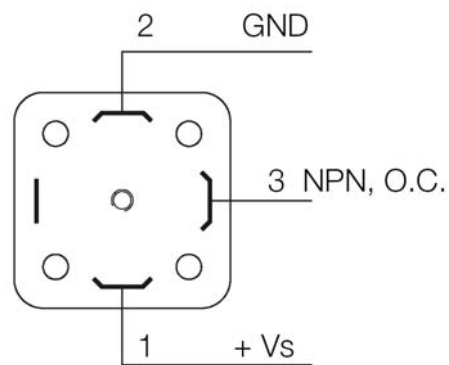
Warning! Incorrect wiring of the connections in the coupling plug can lead to the electronics being destroyed. Make sure that the voltage values of your installation correspond with the voltage values of the measuring instrument.

DRZ

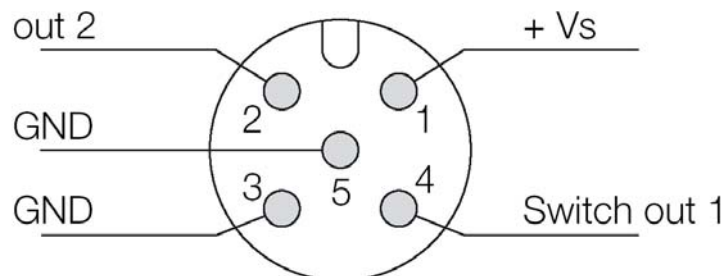
DRZ-..F3..; DRZ-..L3..



DRZ-..0000



DRZ-..C3..



8. Technical Information

Measuring range:	6-420 L/h
Max. flow rate:	600 L/h
Measuring accuracy:	± 1.0% of reading ± 2.5% of reading
Repeatability:	± 0.2%
Standard viscosity range:	5-100 mm ² /s
Process temperature:	max. 80 °C
Ambient temperature:	-10 to +60 °C
Max. pressure:	40 bar
Max. pressure loss:	1.5 bar
Connection:	female thread G 1/8; G 1/4; 1/8 NPT; 1/4 NPT
Mounting position:	independent
Recom. filter fineness:	100 µm
Protection type:	IP 65
Weight:	approx. 0.7 kg (DRZ-..F.., DRZ-..L..) approx. 1.0 kg (DRZ-..C..)

Materials:

Housing:	brass
Piston:	titanium
Magnet holder:	POM
Magnet:	permanent magnet
O-ring/Seal:	FPM

Electronics

OEM frequency output (...0000) (without CE)

Power supply:	5-24 VDC
Supply current:	10 mA
Pulse output:	NPN, open collector, max. 15 mA
Impulse rate:	405 pulses/litre
Electr. connection:	plug connector DIN 43650
Option:	plug-on display AUF-4000 with 4 -20 mA output

Frequency output (...F300)

Power supply:	12-28 V _{DC}
Supply current:	10 mA
Pulse output:	PNP, open collector, max. 25 mA
Impulse rate:	432 pulses/litre
Electr. connection:	plug connector M12x1

Frequency output with frequency divider (...F3X0)

Power supply: 24 VDC \pm 20%
 Supply current: 15 mA
 Pulse output: PNP, open collector,
 max. 25 mA
 Electr. connection: plug connector M12x1
 Division factor: 1:2, 1:4 or customer request

Analogue output (...L303; ...L343)

Power supply: 24 V_{DC} \pm 20%
 Output: 4-20 mA, 0-20 mA, 3-wire
 Max. load: 500 Ω
 Electr. connection: plug connector M12x1

Compact electronics (..C3..)

Display: 3-segment LED
 Analogue output: (0)4...20 mA adjustable, max. 500 Ω
 Switching output: 1 (2) semiconductor PNP
 or NPN, factory setting
 Contact function: N/C or N/O programmable
 Setting: via 2 buttons
 Power supply: 24 V_{DC} \pm 20%,
 3-wire technology
 Electr. connection: plug connector M12x1

9. Order Codes

Example: DRZ-1110 G1 F300

Version	Model	Connection	Evaluating electronics
Brass housing 6 - 420 L/h oil	DRZ-1110	G1 = G 1/8 IG G2 = G 1/4 IG N1 = 1/8 NPT N2 = 1/4 NPT	<p>OEM frequency output, no CE 0000 = DIN plug connector 43650, NPN</p> <p>Frequency output F300 = plug connector M12x1, PNP F320 = plug connector M12x1, PNP, divider 1:2 F340 = plug connector M12x1, PNP, divider 1:4 F390 = plug connector M12x1, PNP, divider adjustable</p> <p>Analogue output L303 = plug connector M12x1, 0 - 20 mA, 3-wire L343 = plug connector M12x1, 4 - 20 mA, 3-wire</p> <p>Compact electronics ¹⁾ C30M = LED display, 2x NPN switch. output, plug con. M12x1 C30R = LED display, 2x PNP switch. output, plug con. M12x1 C34N = LED display, 4 - 20 mA, 1x NPN switching output, plug connector M12x1 C34P = LED display, 4 - 20 mA, 1x PNP switching output, plug connector M12x1</p>

¹⁾ Please specify flow direction in wiring.

Plug-on display

for model DRZ...0000 (OEM version, NPN- and DIN connector)

Description	Order No.
4-digit LED, Plug connector DIN 43 650 Input: pulses of DRZ Output: 4 - 20 mA, 3-wire Load: max. 250 Ω	AUF-4000

Accessories

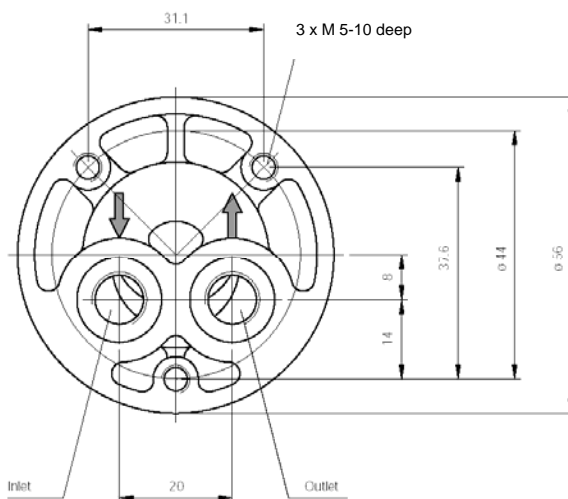
Round plug

Model	Description
ZUB-KAB-12D500	Round plug M12 x 1 socket with screw clamps, 5 pins
ZUB-KAB-12K002	Round plug M12 x 1 socket with 2 m cable, 4 pins
ZUB-KAB-12K005	Round plug M12 x 1 socket with 5 m cable, 4 pins
ZUB-KAB-12Q000	Round plug M12 x 1 socket with Quick-on, 4 pins

10. Dimensions

Dimensions

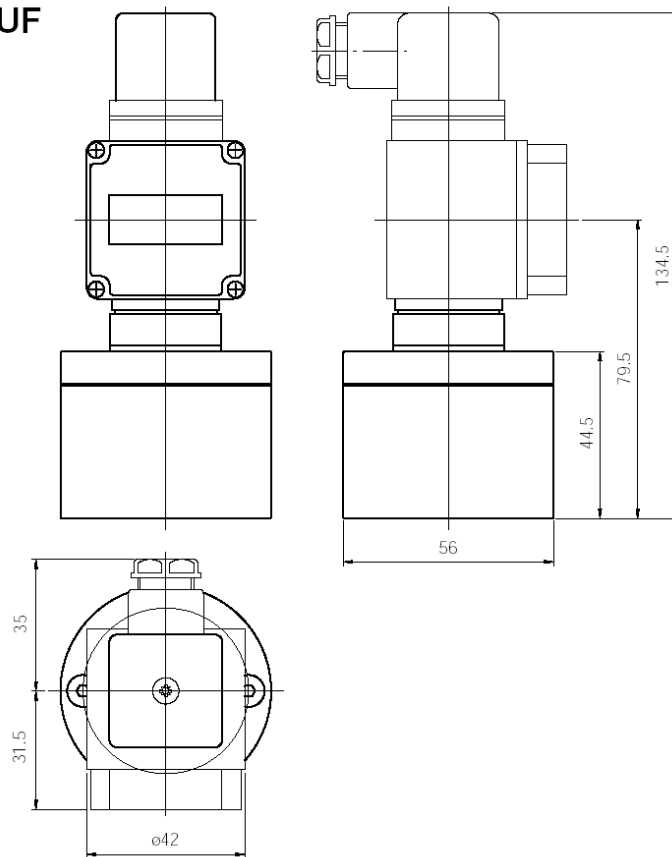
Mechanical connection



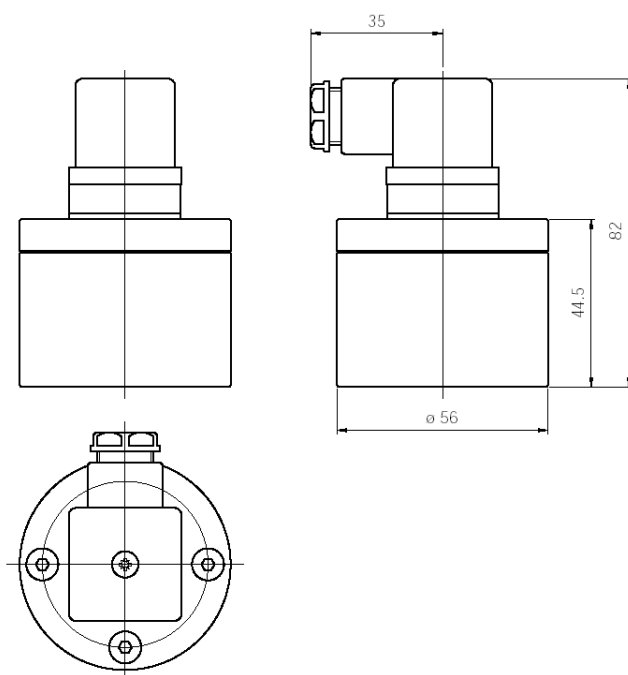
Process connection

- G 1/8
- G 1/4
- 1/8 NPT
- 1/4 NPT

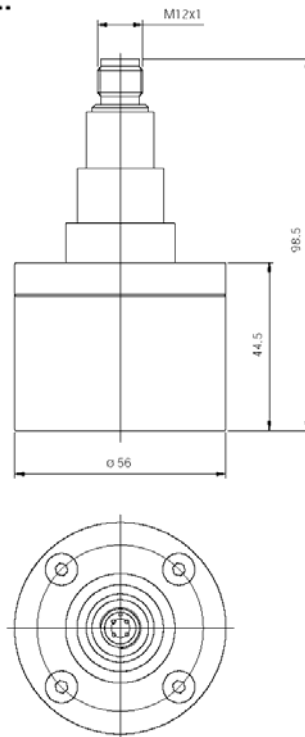
DRZ-...0000 with AUF



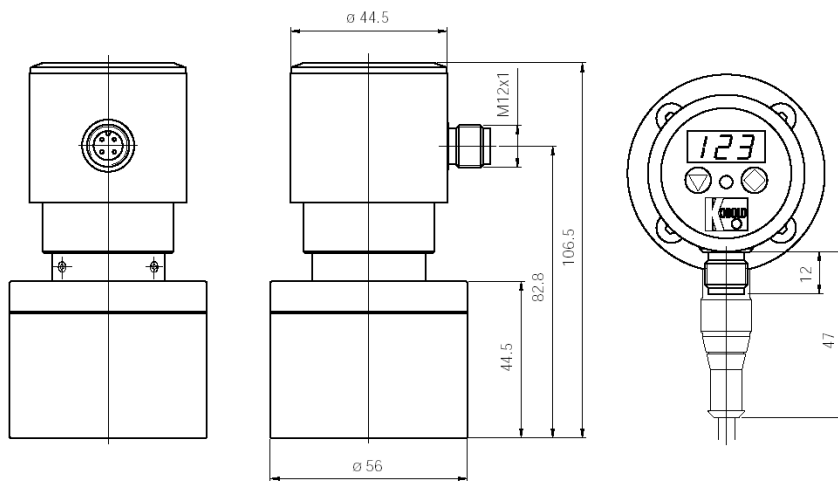
DRZ-...0000



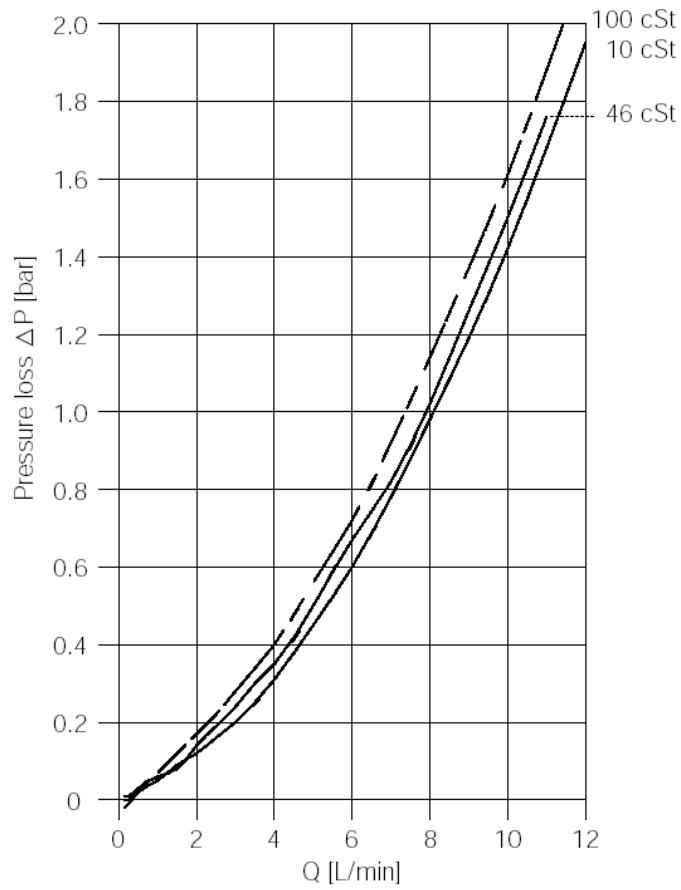
DRZ-..F3..; DRZ-..L3..



DRZ-...C3



11. Pressure Loss Diagram



12. EU Declaration of Conformance

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

Piston Flow Meters Model: DRZ

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

EN 61000-6-3:2011

Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments

61000-6-2:2006

Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments

EN 61010-1:2010

Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements

EN 60529:2014

Degrees of protection provided by enclosures

EN 50581:2012

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

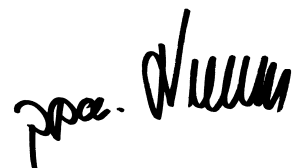
Also the following EC guidelines are fulfilled:

2014/30/EU	EMC Directive
2014/35/EU	Low Voltage Directive
2011/65/EU	RoHS (category 9)

Hofheim, 11. Jan. 2018



H. Peters
General Manager



M. Wenzel
Proxy Holder