



# Piston Flowmeters

for viscous media



measuring  
•  
monitoring  
•  
analysing

DRZ



Model: DRZ-...C3

- Measuring range: 6 - 420 l/h oil
- Measuring accuracy:  $\pm 1.0\%$  of reading
- $p_{\max}$ : 40 bar;  $t_{\max}$ : 80 °C
- Viscosity range: 5 - 100 mm<sup>2</sup>/s
- Connection: G $\frac{1}{8}$ , G  $\frac{1}{4}$ ,  $\frac{1}{8}$ " NPT,  $\frac{1}{4}$ " NPT
- Material: brass housing



Model: DRZ-...0000  
with AUF



Model: DRZ-...F  
DRZ-...L



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### Description

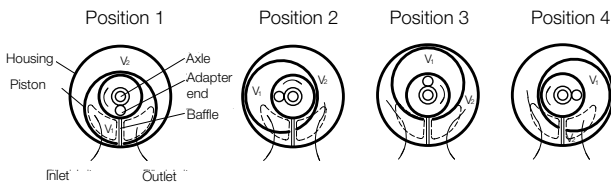
KOBOLD piston flowmeters are direct volume counters, also called displacement counter (positive displacement meter). Its function is based on continuous limitation of a definite part-volume of the flow in a measuring cell through continuous filling and emptying of this measuring cell. The measuring cell 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 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-adaptor in a ring chamber at the bottom and top of the measuring-body and also 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 space, it wants to increase this space and therefore turns the piston, until one after the other the volumes V1 and V2 are reached. While moving ahead, these filled spaces get 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 adaptor end is equal to the flow of the measuring chamber content (V1 + V2). With the help of a located magnet and a Hall-type sensor it is possible to create a digital signal, which can be evaluated.

### Application Examples

- Heating oil consumption measurement
- Fuel consumption measurement
- Consumption control
- Flow measurement of mineral-oil
- Dosing and bottling of oil
- Engine-testing application

### Technical Details

Measuring range:	6-420 l/h
Max. flow rate:	600 l/h
Measuring accuracy:	±1.0% of reading
Repeatability:	±0.2%
Standard viscosity range:	5-100 mm <sup>2</sup> /s
Process temperature:	max. 80 °C
Ambient temperature:	-10...+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:	IP65
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 V <sub>DC</sub>
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/24 V <sub>DC</sub>
- Frequency output (...F300)
 

Power supply:	12-28 V <sub>DC</sub>
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 V <sub>DC</sub> ±20%
Supply current:	15 mA
Pulse output:	PNP, open collector, max. 25 mA
Electr. connection:	plug connector M12x1
Division factor:	1...1/128, set by customer's request

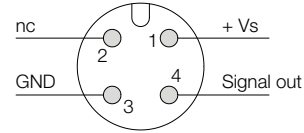


**Technical Details** (continued)

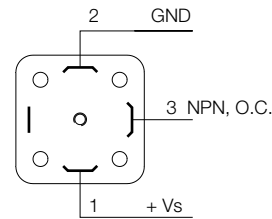
- Analogue output (...L303; ...L343)
  - Power supply: 24 V<sub>DC</sub> ±20%
  - Output: 4-20 mA, 0-20 mA, 3-wire
  - Max. load: 500 Ω
  - Electr. connection: plug connector M12x1
- Compact electronics (...C3..)
  - Display: 3-segment LED
  - Analogue output: (0)4...20 mA adjustable, max. 500 Ω
  - Switching output: 1 (2) semiconductor PNP or NPN, factory setting
  - Contact function: N/C / N/O programmable
  - Setting: via 2 buttons
  - Power supply: 24 V<sub>DC</sub> ±20%, 3-wire technology, approx. 100 mA
  - Electr. connection: plug connector M12x1

**Electrical Connection**

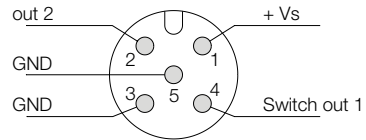
**DRZ-...F3..; DRZ-...L3..**



**DRZ-...0000**



**DRZ-...C3..**



**Order Details:** (Example: DRZ-1110 G1 F300)

Version	Model	Connection	Evaluating electronics
Brass housing 6-420 l/h oil	<b>DRZ-1110</b>	<b>G1</b> = G 1/8" female <b>G2</b> = G 1/4" female <b>N1</b> = 1/8" NPT <b>N2</b> = 1/4" NPT	<b>OEM-frequency output, no CE</b> <b>0000</b> = DIN plug connector, NPN  <b>Frequency output</b> <b>F300</b> = plug connector M12x1, PNP <b>F320</b> = plug connector M12x1, PNP, divider 1:2 <b>F340</b> = plug connector M12x1, PNP, divider 1:4 <b>F390</b> = plug connector M12x1, PNP, divider 1...1/128  <b>Analogue output</b> <b>L303</b> = plug connector M12x1, 0-20 mA, 3-wire <b>L343</b> = plug connector M12x1, 4-20 mA, 3-wire  <b>Compact electronics<sup>1)</sup></b> <b>C30M</b> = LED display, 2xNPN switch. output, plug connector M12x1 <b>C30R</b> = LED display, 2xPNP switch. output, plug connector M12x1 <b>C34N</b> = LED display, 4-20 mA, 1xNPN switch. output, plug connector M12x1 <b>C34P</b> = LED display, 4-20 mA, 1xPNP switch. output, plug connector M12x1

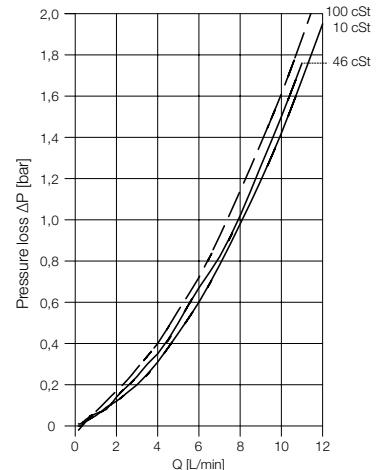
<sup>1)</sup> Please specify flow direction in writing.

**Plug-on Display**

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

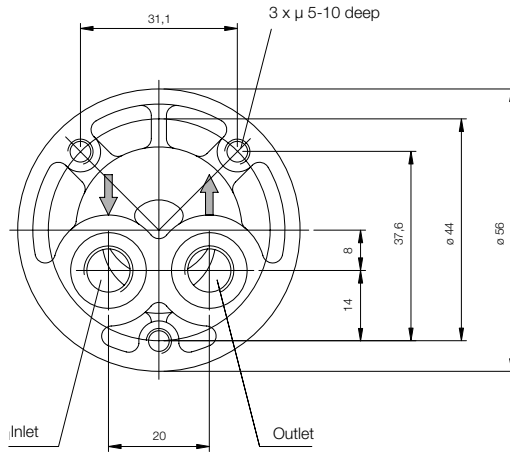
Order number	Description
<b>AUF-4000</b>	4-digit red LED, Plug connector DIN 43650 Input: pulses of DRZ (NPN-Hall effect sensor) Output: 4-20 mA, 3-wire Load: max. 250 Ω Power supply: 24 V <sub>DC</sub>

**Pressure Loss Diagram**



**Dimensions [mm]**

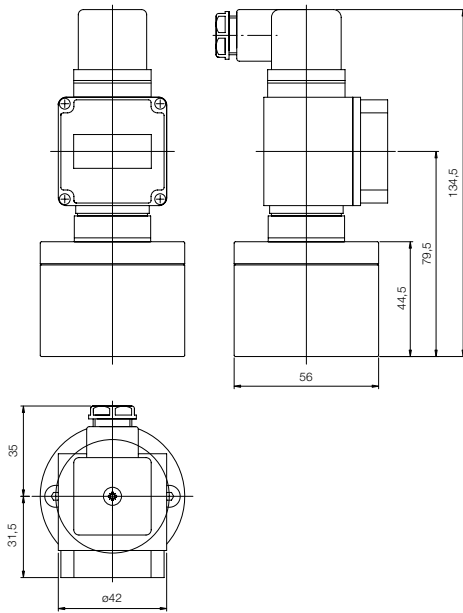
**Mechanical connection**



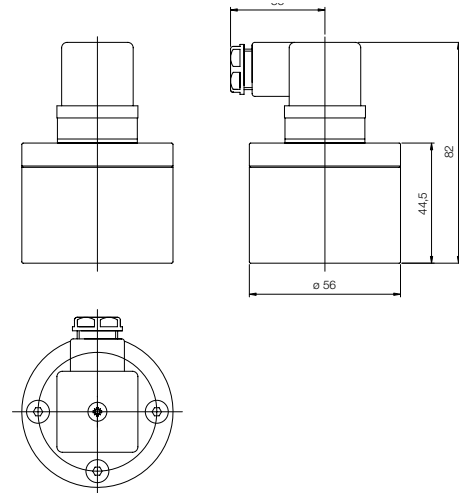
**Process connection**

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

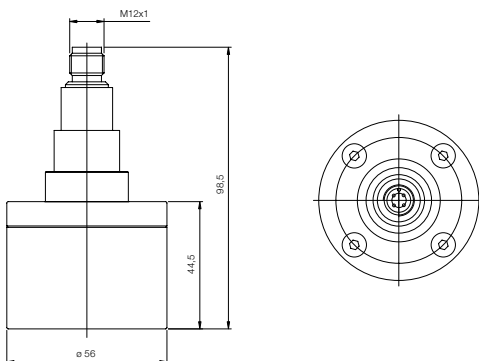
**DRZ-...0000 with AUF**



**DRZ-...0000**



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



**DRZ-...C3**

