

**Operating Instructions
for
Rotating Vane Flow Meter**

Model: DRH-...



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Manufactured and sold by:

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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 machinery, the flow meter should only be placed in operation if the machine in use complies with the EEC machinery guidelines.

According to PED guideline 97/23/EC

No CE marking, see Article 3, Section 3 "Sound engineering practice",
Guideline 97/23/EC

Diagram 8, Piping systems, Group 1 Hazardous fluids

3. Instrument Inspection

Instruments are inspected before shipping and sent away 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:

- Rotating Vane Flow Meter model: DRH-...
- Operating instructions

4. Regulation Use

Any use of the DRH which exceeds the manufactures 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 Rotating Vane Flow Meters series DRH are used for measuring and monitoring low viscous liquids.

Series DRH flow meters are working according the well known rotating vane principle. A magnet fitted in the vane and hermetically sealed from the medium transfers non-contacting the rotary motion to a Hall-effect sensor mounted in the housing. The sensor converts the rotary motion which is proportional to the flow to a frequency signal. A series-connected electronics unit converts the signal to an analogue output, limit contacts or display.

This devices can be adapted to prevailing plant conditions with the 360° rotatable screw connections.

6. Mechanical Connection

6.1. Check service conditions:

- Flow rate
- Maximum operating pressures
- Maximum operating temperature



Attention! Overage can cause damage to bearings and cause major measuring errors.

6.2. Installation

- It must be ensured that the instrument housing is continuously filled with the flow medium, especially for flows from top to bottom. No straight lengths are necessary at inlet and outlet connections.
- Check that flow is in the direction of the arrow on the front of the unit, and that the face of the unit is aligned in the vertical plane (axle in horizontal plane)
- Avoid pressure and tensile loads
Mechanically secure the inlet and outlet lines 50 mm from the connection
- Check connections for leaks.

7. Electrical Connection

7.1. General



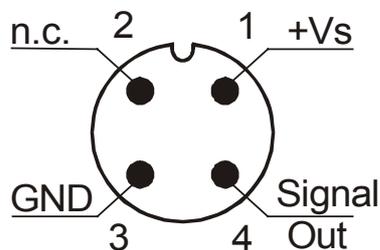
Attention! Make sure that the voltages in your plant correspond with the flow meter voltages.

- Make sure that all electrical supply lines are de-energised.
- For outputs that have the 4 pin or 5 pin M-12 Micro-DC plug connection, the mating plug wire color to pin assignment is as follows:
Brown= Pin 1; White= Pin 2; Blue= Pin 3; Black= Pin 4; Gray= Pin 5 (5 pin only)
- We recommend a power supply cable with diameter 0.25 mm².



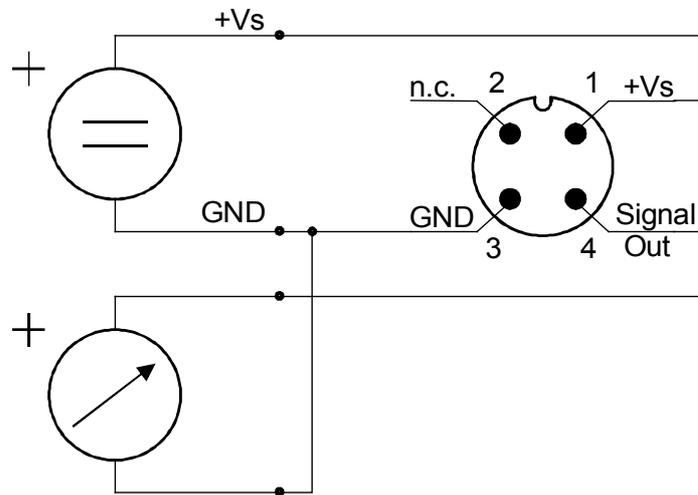
Attention! The instrument electronics may be damaged if the cable connections are assigned incorrectly.

7.2. Output electronics: Frequency output (..F300;..F320, ..F340)

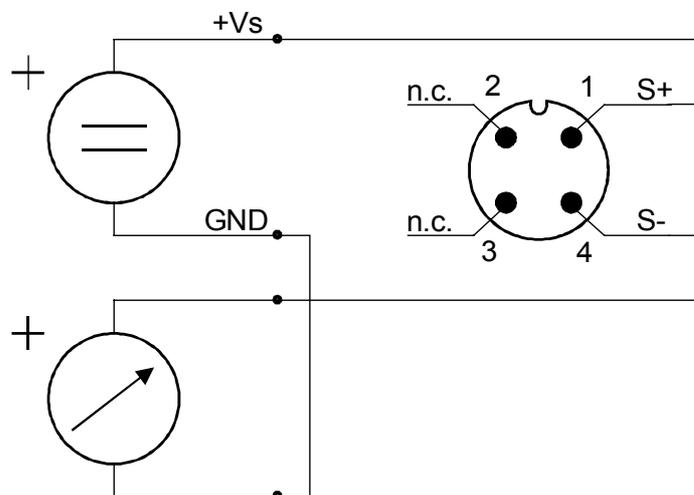


7.3. Output electronics: Analog output (..L303, ..L342, ..L343, ..L442)

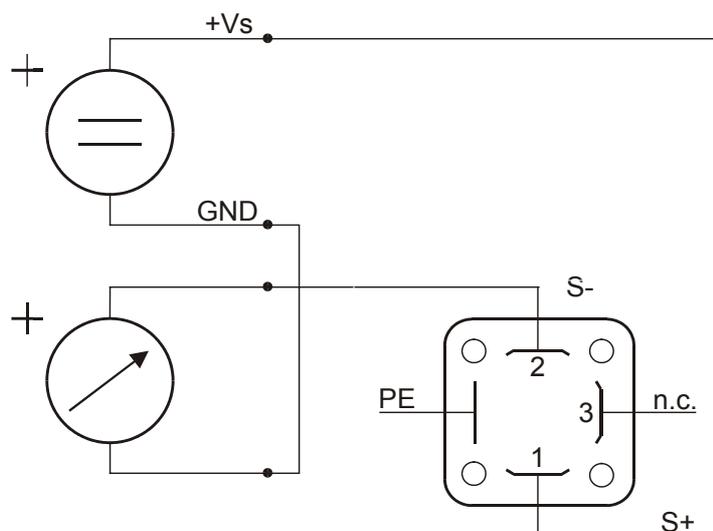
3-wire (..L303, ..L343)



2-wire (..L342)



2-wire, DIN plug connector (..L442)



7.4. Compact electronics: (..C30R, ..C30M, ..C34P, ..C34N)

7.4.1. General



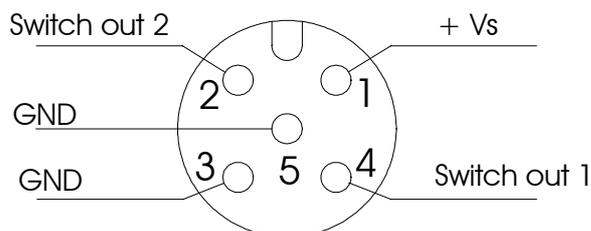
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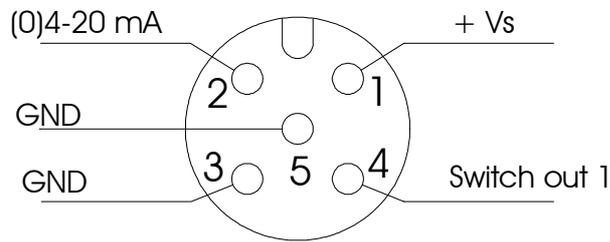


Attention! The instrument electronics may be damaged if the cable connections are wired incorrectly.

7.4.2. Compact electronics: (..C30R, ..C30M)

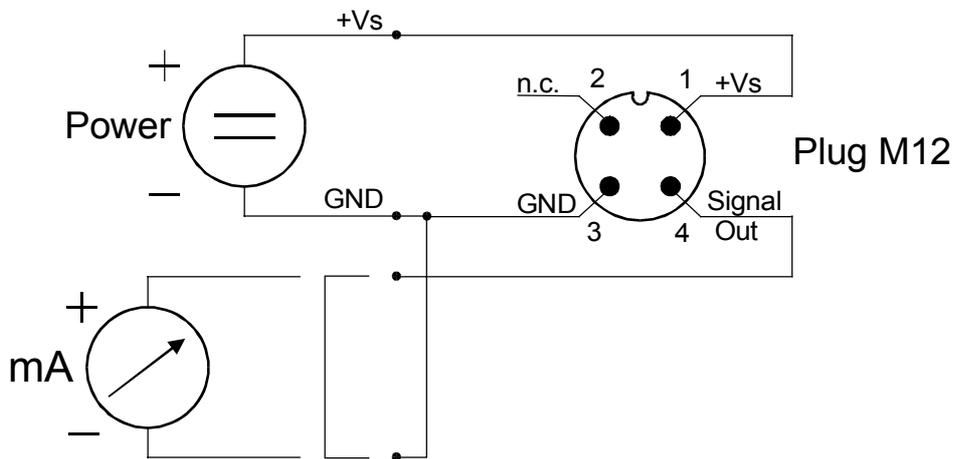


7.4.3. Compact electronics: (..C34P, ..C34N)



The GND terminals 3 and 5 are common and can therefore be used for the output signal and/or power supply.

7.5. Output electronics: Pointer Indication (..Z300, ..Z340)



Attention! In case current output is not needed, PIN 4 (Signal Out) is to be permanently jumpered with Ground (GND) (short circuit jumper).

8. Commissioning – Output electronics

8.1. General

The measuring instruments are preset and are ready for operation after electrical connection.

8.2. Setting - compact electronics

See:
Operating instructions supplement
for compact electronics with frequency output

9. Maintenance

If the medium to be measured is clean, the Model DRH is virtually maintenance-free. It is particularly important to guard against contamination by ferritic (iron metal) contaminants. These can be eliminated by using e.g. the KOBOLD magnetic filter, model MFR.

However, if the sensor must be cleaned, it can be opened to gain access to the internal parts. Make sure that the sensor and, especially, the blades are not damaged during this procedure. When re-assembling, be certain that the vane is carefully positioned and oriented correctly.

Work on the sensor and electronics should only be carried out by the manufacturer, otherwise the guarantee is nullified

10. Technical Information

10.1. Sensor data

Material combinations:	see order details
Max. operating pressure:	see order details
Max. temperature:	see order details
Measuring accuracy:	±2.5 % f. s. ±5% f. s. (DRH-...F300)
Electrical connection:	plug connector DIN 43 650, plug connector M12x1, cable
Pressure loss:	max. 1 bar at max. range
Protection:	IP 65

Material combinations

Device parts	Order code: 1	Order code: 2	Order code: 4	Order code: 5	Order code: 7	Order code: 8	Order code: 9
Housing	Brass, nickel-plated	Brass, nickel-plated	1.4404	1.4404	POM	POM	PVDF
Housing cover	PMMA	Brass, nickel-plated	PMMA	1.4404	PMMA	POM	PVDF
Gasket	NBR	NBR	FPM	FPM	NBR	NBR	FPM
Rotating vane	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE
Axle	Ceramic	Ceramic	Ceramic	Ceramic	Ceramic	Ceramic	Ceramic
Bearing	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE
p_{max}	16 bar	100 bar	16 bar	100 bar	16 bar	16 bar	16 bar
t_{max}	80 °C	100 °C	80 °C	100 °C	80 °C	80 °C	80 °C
Weight (3/8")	850 g	1000 g	900 g	1050 g	250 g	250 g	300 g
Weight (1")	1600 g	2000 g	1600 g	2000 g	400 g	400 g	500 g

Electronics weight

Frequency output:	approx. 35 g
Analog output (...L3...):	approx. 35 g
Analog output (...L4...):	approx. 100 g
Compact electronics:	approx. 650 g
Mechanical Indicator:	approx. 450 g

10.2. Output electronics

Frequency output (...F300)

Power supply:	12-28 VDC
Power consumption:	10 mA
Pulse output:	PNP, open collector, max. 25 mA
Electrical connection:	plug connector M12x1

Frequency output with frequency divider

Power supply:	24 VDC $\pm 20\%$
Power consumption:	15 mA
Pulse output:	PNP, open collector, max. 25 mA
Electrical connection:	plug connector M12x1
Division ratio:	1...1/128, factory setting

Analog output (w/plug-on display option)

Power supply:	24 VDC $\pm 20\%$
Output:	0-20 mA or 4-20 mA, 2-wire or 3-wire
Max. load:	500 Ω .
Electrical connection:	plug connector M12x1 or DIN 43 650
Option:	plug-on display (with plug connector DIN 43 650 and output 4-20 mA only), 2-wire

Compact electronics

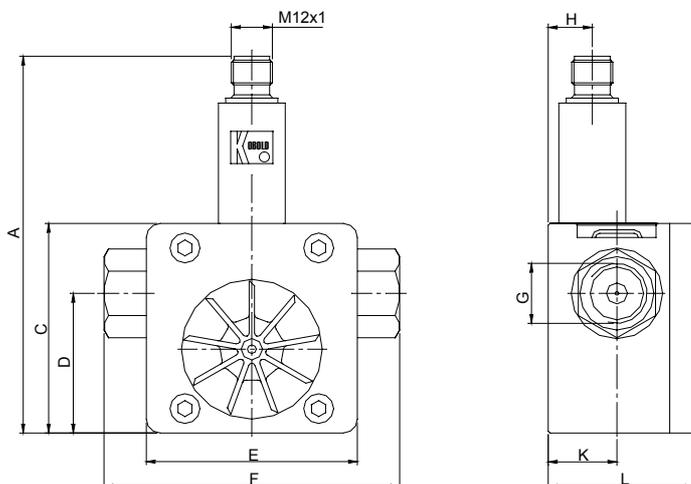
Display:	3-segment LED
Analog output:	(0)4 -20 mA adjustable, max. 500 Ω
Switching outputs:	1 (2) semiconductor PNP or NPN, factory set
Contact operation:	N/C / N/O contact frequency programmable
Setting:	with 2 buttons
Supply:	24 VDC $\pm 20\%$, 3-wire technology, approx. 100 mA
Electrical connection:	plug connector M12x1

Pointer indication with analog output

Housing:	aluminium
Display:	moving-coil instrument, 240° display
Power supply:	24 VDC $\pm 20\%$
Output:	4-20 mA or 0-20 mA, 3-wire
Max. load:	250 Ω
Electrical connection:	plug connector M12x1

11. Dimensions

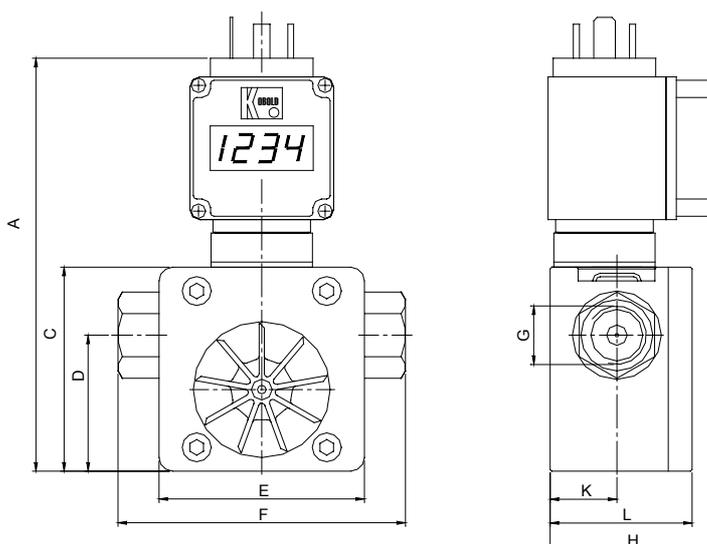
Model: DRH-...L3.. / DRH-...F3..



G/NPT	A	C	D	E	F	H	K	L
3/8	108,0	60	40	60	84	12,5	19,5	41,5
1	118,0	70	42	70	110	15,8	22,5	53

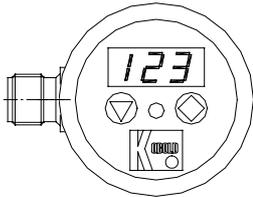
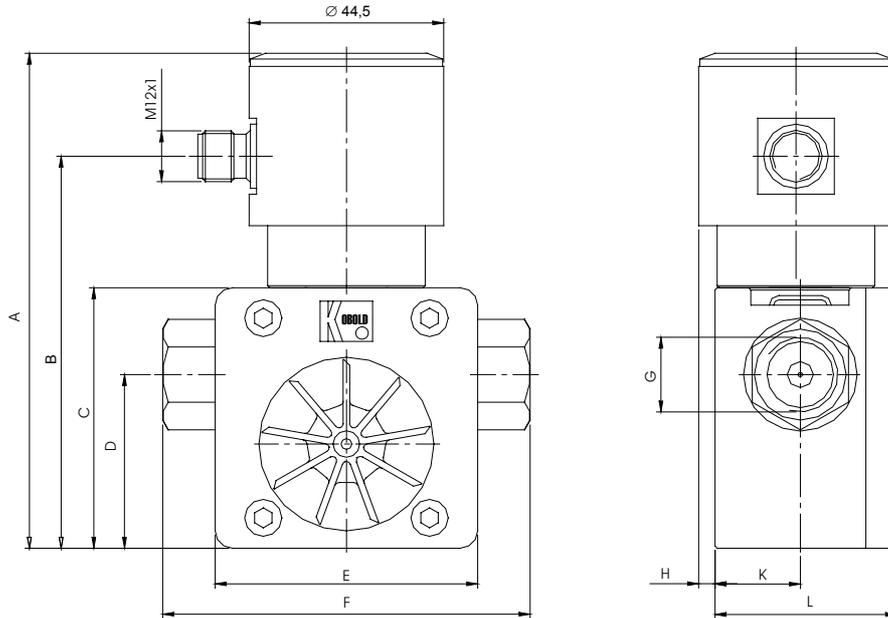
Model: DRH-...L4..

(with analog output and plug-on display option)



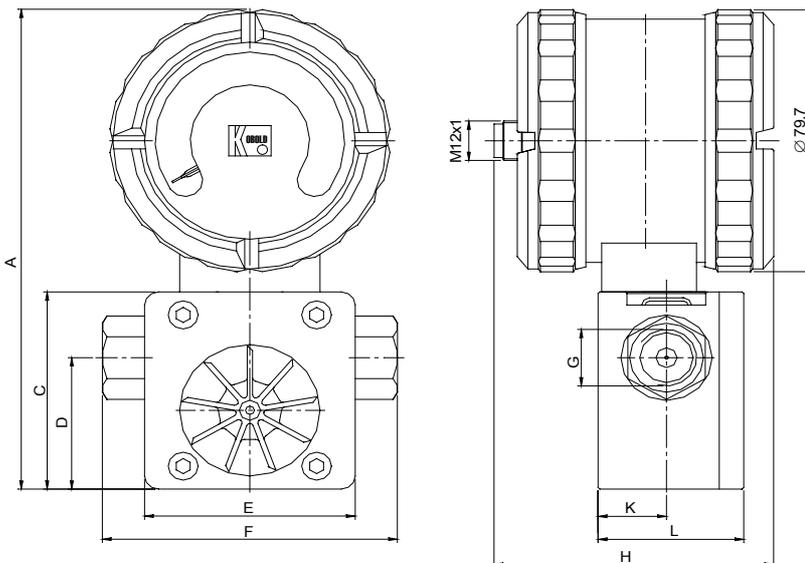
G/NPT	A	B	C	D	E	F	H	K	L
3/8	121,5	-	60	40	60	84	47,5	19,5	41,5
1	131,5	-	70	42	70	110	-	22,5	53

Model: DRH-..C.. (with compact electronics)



G/NPT	A	B	C	D	E	F	H	K	L
3/8	114	90,3	60	40	60	84	3,8	19,5	41,5
1	124	100,3	70	42	70	110	1,8	22,5	53

Model: DRH-..Z.. (with pointer Indicator)



G/NPT	A	C	D	E	F	H	K	L
3/8	146,0	60	40	60	84	79,6	19,5	41,5
1	156,0	70	42	70	110	79,6	22,5	53