



**Operating Instruction
for
Rotating Vane Flow Meter**

Model: DRG-...



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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 EG-machine guidelines.

PED 2014/68/EU

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

Table 8, Pipe, Group 1 dangerous fluids

3. Regulation Use

The Model DRG-..., rotating vane flow meter is to be installed only in applications that are within the specified operating limits. An use which exceeds the specifications is prohibited. Any damages resulting therefrom are not the responsibility of the manufacturer. The user assumes all risk for such usage. The application specifications include the installation, start-up and service requirements specified by the manufacturer.

4. Operating Principle

KOBOLD rotating vane flow meters series DRG are used for measuring and monitoring low viscosity liquids. Series DRG flow meters are working according the well known rotating vane principle. A magnet fitted in the vane and hermetically sealed from the medium transfers the rotary motion of the vane 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. The frequency is therefore proportional to flowrate. A series-connected electronics unit converts the signal to an analogue output, limit contacts or display.

5. Instrument Inspection

These devices are checked before dispatch and sent away in perfect condition. Should the damage to a device be visible, we recommend a thorough inspection of the delivery packing. In case of damage, please inform your parcel service/ forwarding agent immediately, since they are responsible for damages during transit.

Scope of delivery:

- Rotating Vane Flow Meter model: DRG
- Operating Instructions

6. Mechanical Connection

6.1. Operational conditions check up:

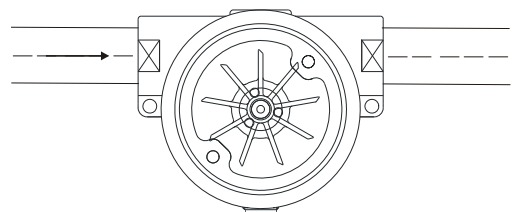
- Max. flowrate
- Max. operational pressure
- Max. operational temperature



Attention! In case, specified range is over-violated, bearings may get damaged and considerable measurement errors may result.

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.
- Flow in the direction of arrow pointer (position independent), front side of the unit must stand in a vertical plane.
- Pressure and tensile loading should be avoided.
Inlet and outlet (piping) should be braced at a distance of 50 mm from the connection location.
- Sealing of connections should be checked.



7. Electrical Connection

7.1. General



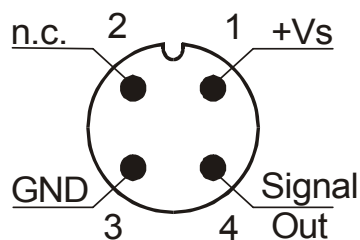
Attention! Please ensure that the voltage levels of your system are in agreement with that of the flow meter.

- Make sure that the electric supply lines are de-energized.
- Connect the power supply and output signal on the plug-pins as shown below.
- We recommend a cross-sectional area of 0.25 mm² of power supply cable.



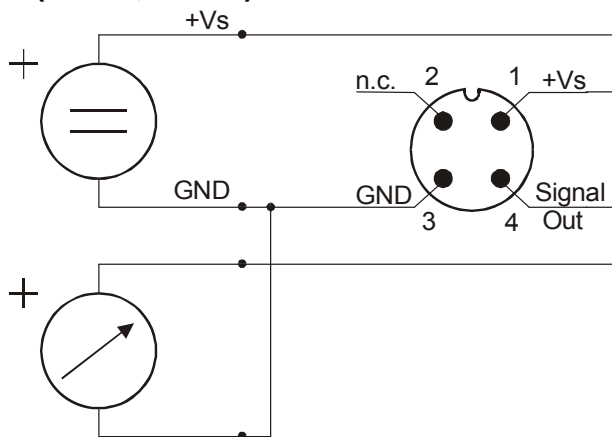
Attention! A wrong plug-connection can lead to destruction of unit's electronics.

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

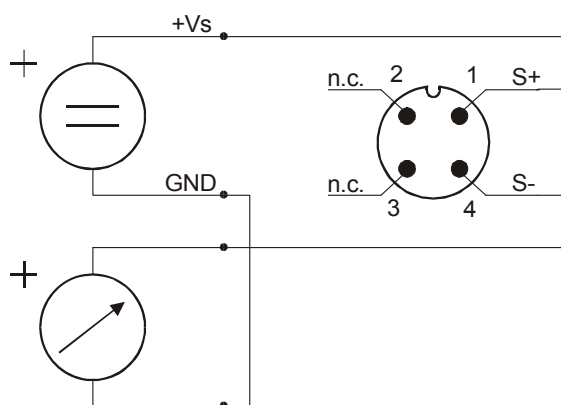


7.3. Evaluation electronics: Analogue output (..L303, ..L342, ..L343, ..L442)

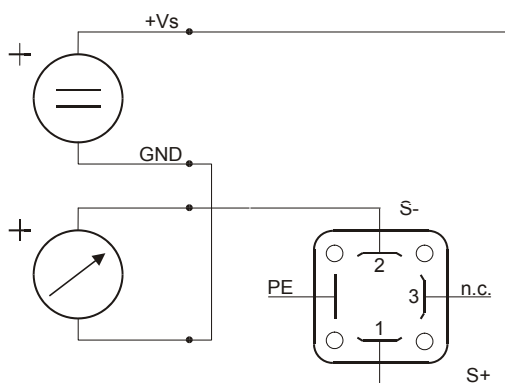
3-wire (..L303, ..L343)



2-wire (..L342)



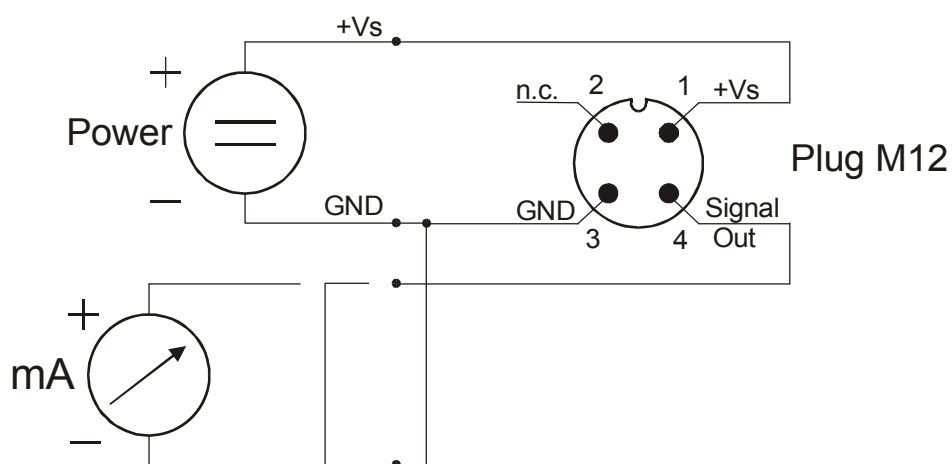
2-wire, DIN-plug (..L442)



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

Please see
Instruction Manual-Supplement
for Compact Electronics

7.5. Evaluation electronics: Pointer display (..Z300, ..Z340)



Attention! If the current output is not needed, PIN 4 (Signal Out) must be connected permanently with Ground (GND) (Short Circuit Link).

8. Commissioning – Evaluation Electronics

8.1. General

The measuring units are pre-adjusted and ready for use after electrical connection.

8.2. Adjustment – Evaluation Electronics

Please see
Instruction Manual-Supplement
for Compact Electronics with frequency output

9. Technical Information

9.1. Sensor data

Material combinations:	see order details
Max. operating pressure:	see order details
Max. temperature:	see order details
Measuring accuracy:	±3% f. s.
Electrical connection:	plug connector DIN 43 650, plug connector M12x1
Pressure loss:	max. 1 bar at max. range value
Protection:	IP 65

Unit parts	Ordering code: 1	Ordering code: 2	Ordering code: 4	Ordering code: 5	Ordering code: 8	Ordering code: 9
Housing	Brass casting	Brass casting	1.3955	1.3955	PP	PP
Housing cover	PSU	Brass casting	PSU	1.4404	PP	PSU
Sealing	NBR	NBR	FPM	FPM	NBR	NBR
Vane	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE
Axle	Ceramic	Ceramic	Ceramic	Ceramic	Ceramic	Ceramic
Bearings	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE
Max. Pressure	16 bar	40 bar	16 bar	40 bar	7 bar	7 bar
Max. Temp.	80°C	80°C	80°C	80°C	80°C	80°C
Sensor Weight	580 g	580 g	480 g	480 g	120 g	120 g

9.2. Evaluation electronics

Frequency output (...F300)

Supply voltage:	12 - 28 V _{DC}
Current intake:	10 mA
Pulse output:	PNP, open collector, max. 25 mA
Electrical connection:	Plug M12x1

Frequency output with frequency divider

Supply voltage:	24 V _{DC} ±20%
Current intake:	15 mA
Pulse output:	PNP, Open Collector, max. 25 mA
Electrical connection:	Stecker M12x1
Dividing factor:	1...1/128, factory setting

Analogue output (option: on-plug display)

Supply voltage:	24 V _{DC} ±20%
Output:	0-20 mA or 4-20 mA, 2- or 3-wire
Max. load:	500 Ohm
Electrical connection:	Plug M12x1 or DIN 43 650
Option:	plug-on display (only with plug DIN 43 650 and 4-20 mA output), 2 conductor

Compact electronics

Display:	3-digit LED
Analogue 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: approx.	24 V _{DC} ±20%, 3-wire technology, 100 mA
Electrical connection:	plug connector M12x1

Pointer display with analogue output

Housing:	Aluminium
Display:	Moving-coil instrument, 240° display
Supply voltage:	24 V _{DC} ±20%
Output:	0-20 mA or 4-20 mA 3-conductor
Max. load:	250 Ohm
Electr. connection:	Plug M12x1

10. Order Details

(example: DRG-1105 G1 F300)

Measuring range		Orifice diameter durch- [mm]	Model	Connection		Evaluating electronics
L/min water	approx. frequency (Hz) at f.s.			Standard fem. thread	Special fem. thread	
0,5-12	120	6	DRG-1X05...	..G1..=G 1/8	..N1..=1/8 NPT	Frequency output ..F300= Frequency output, plug connector M12x1 ..F320= Frequency divider 1:2, plug connector M12x1 ..F340= Frequency divider 1:4, plug connector M12x1 ..F390= Frequency divider 1... ¹ /128, plug connector M12x1
0,5-25	217	6	DRG-1X10...	..G2..=G ¼	..N2..=1/4 NPT	
1-30	217	8	DRG-1X15...	..G2..=G ¼	..N2..=1/4 NPT	Analogue output ..L303= 0-20 mA output, 3-wire, plug connector M12x1 ..L342= 4-20 mA output, 2-wire, plug connector M12x1 ..L343= 4-20 mA output, 3-wire, plug connector M12x1 ..L442= 4-20 mA output, 2-wire, plug connector DIN 43 650
1-30	190	7	DRG-1X15...	..G4..=G ½	..N4..=1/2 NPT	
2-45	215	8	DRG-1X20...	..G4..=G ½ ..G5..=G ¾ ..G6..=G 1	..N4..=1/2 NPT ..N5..=3/4 NPT ..N6..=1 NPT	Compact electronics* ..C30R= LED display, 2x open coll., PNP, plug con. M12x1 ..C30M= LED display, 2x open coll., NPN, plug con. M12x1 ..C34P= LED display, 4-20 mA, 1x open coll., PNP, plug connector M12x1 ..C34N= LED display, 4-20 mA, 1x open coll., NPN, plug connector M12x1
5-90	265	12	DRG-1X25...	..G4..=G ½ ..G5..=G ¾ ..G6..=G 1	..N4..=1/2 NPT ..N5..=3/4 NPT ..N6..=1 NPT	
5-140	116	16	DRG-1X30...	..G5..=G ¾	..N5..=3/4 NPT	Pointer indication* ..Z300= 240° - pointer indication, 0-20 mA, plug con. M12x1 ..Z340= 240° - pointer indication, 4-20 mA, plug con. M12x1
10-140	180	16	DRG-1X35...	..G6..=G 1	..N6..=1 NPT	

* Please specify flow direction in writing

Plug-on display

For Model DRG... L342 (with 4-20 mA output and DIN plug connector)

Description	Order number
4-digit LED, connector DIN 43650, 2-wire, supply through analogue output	AUF-1000
as above however with additional open collector output	AUF-1001

11. Maintenance

If the medium to be measured is not contaminated, the measuring unit is maintenance-free. In order to avoid problems, we recommend installation of a filter, such as magnet filter, model MFR.

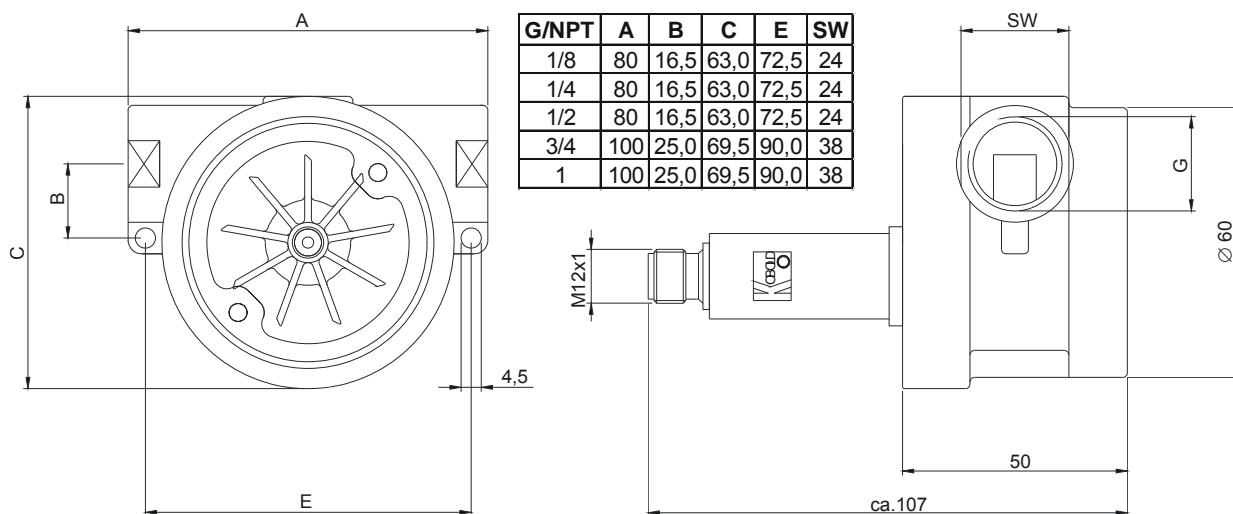
Should cleaning of sensor be deemed necessary, the sensor may be opened and inner parts may be accessed. Please be attentive during dismantling so that the sensor and in particular, the vane is not damaged. During assembly the right placement and the mounting direction of the vane should not be overlooked.

Electronic repairs may only be carried out by the manufacturer to prevent voiding of warranty.

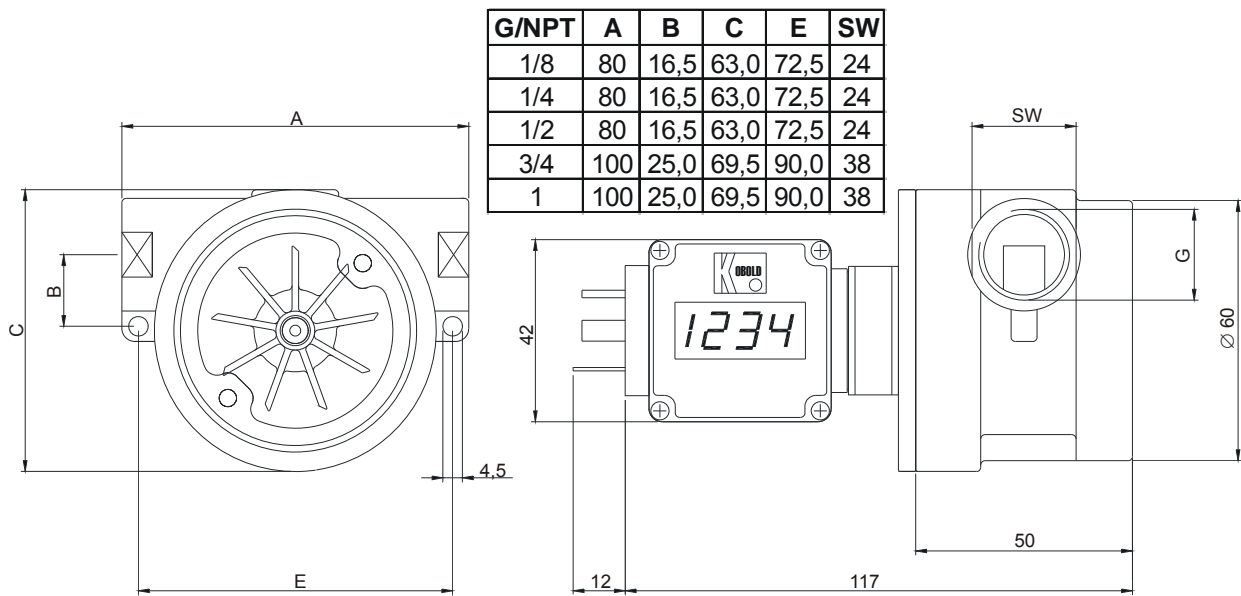
12. Dimensions

Model: DRG – F... (frequency output)

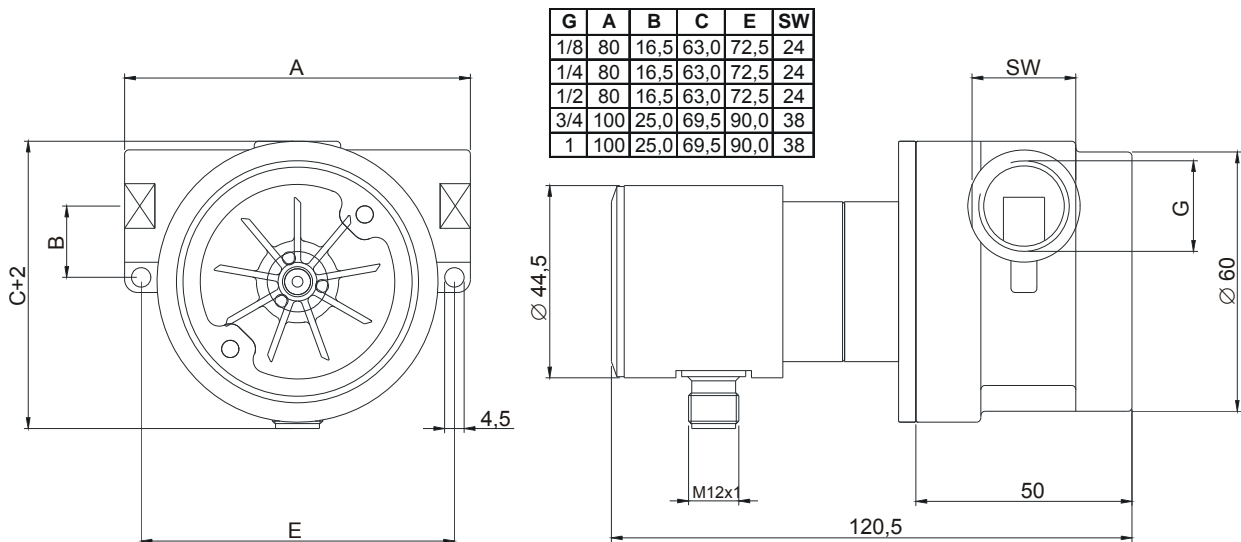
DRG...L3...
(with analogue output)



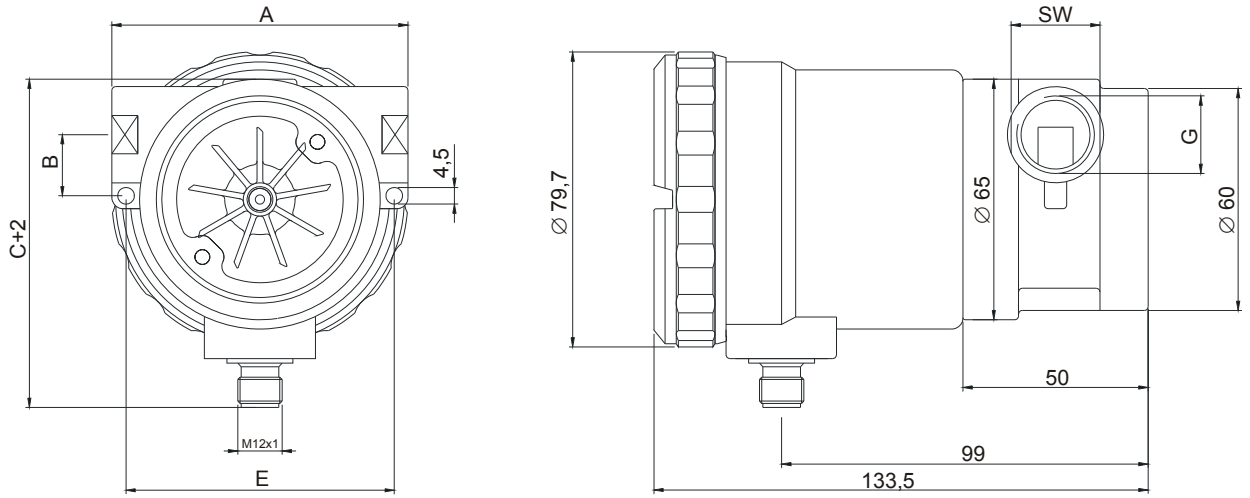
Model: DRG-..L442
(analogue output and option plug-on display)



Model: DRG-..C.. (with Compact Electronics)



Model: DRG-..Z.. (with pointer display)



G/NPT	A	B	C	E
1/8	80	16,5	63,0	72,5
1/4	80	16,5	63,0	72,5
1/2	80	16,5	63,0	72,5
3/4	100	25,0	69,5	90,0
1	100	25,0	69,5	90,0

13. EU Declaration of Conformance

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

Rotating Vane Flow Meter Model: DRG -...

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

EN 61000-6-4:2011

Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments

EN 61000-6-2:2005

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 (IP Code)

Also the following EU guidelines are fulfilled:

2014/35/EU

Low Voltage Directive

2014/30/EU

EMC Directive


2011/65/EU

RoHS (category 9)

Hofheim, 27. Apr. 2016



H. Peters
General Manager



M. Wenzel
Proxy Holder