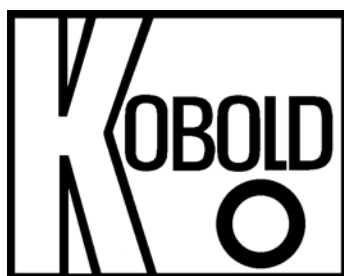


Operating Instruction
for
Small-volume Rotating-vane
Flow Meter
Model: DPL



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2. Note

Please read and take note of these operating instructions before unpacking and setting the unit for operation, and 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 with the prevailing regulation applying to procedural safety and the prevention of accidents.

3. Warranty

Scope of warranty applies in accordance with our conditions of delivery. Repairs during the guarantee period require our agreement and instructions, and may only be carried out through our supplier or one of our approved commission agents.

4. Application

A trouble-free operation of KOBOLD rotating vane flow meters is ensured only if all points of consideration described in this manual are well-observed. For damages, resulting from negligence of these guidelines, the validity of warranty expires.

5. Unit Check-up

These devices are checked before despatch and sent away in perfect condition. Should the damage to a device be visible, we recommend an exact inspection of delivery packing. In case of damage, please inform your postal service/forwarding agent immediately, since the carrier company is responsible for any damages during transit.

Scope of delivery

All parts falling under standard scope of delivery are firmly attached with the device.

6. Working Principle

The medium flows through a specially formed flow-chamber and causes thereby an impeller to rotate. This rotating motion is scanned opto-electronically in a contactless manner and converted into an asymmetrical frequency signal. Optionally, a frequency divider with symmetrical output is available. The generated frequency is proportional to the flow rate. The impeller contains sapphire-bearings, due to which, high linearity and long life of device are ensured.

7. Mechanical Connection

- Make sure that the actual flow rate corresponds with the measuring range of the device. The measuring range (full scale value) can be read off from the type label.

Note! During measuring range over-stepping (more than 20%), damage to the axle bearings can occur, which impairs the function of the flow meter.

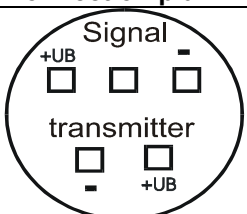
- Make sure that the permitted max. operating pressure and temperature of the device DPL are not violated.
- Remove all the transportation-safety locks etc. and ensure, that there exist no packing-material parts inside the unit.
- These units can be mounted without regard to position. Thereby, the flow must always take place in the direction of the arrow.
- In particular, attention must be paid to flow from top to bottom, such that the flow chamber is completely filled with the liquid. Additional inlet and outlet lengths are not required.
- The sealing of connection screw joints is succeeded through Teflon tape or similar material.
- During installation of the unit, attention must be paid to see that no high pressure or tensile loads exert on the connection screw joints. We recommend to fasten an inlet and outlet pipe mechanically at a distance of approx. 50 mm from the connection screw joint.
- If possible, after mechanical installation, check whether the sealing of connection-joints/piping is adequate.

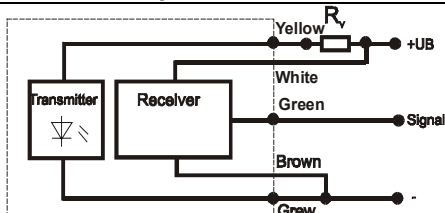
8. Electrical Connection

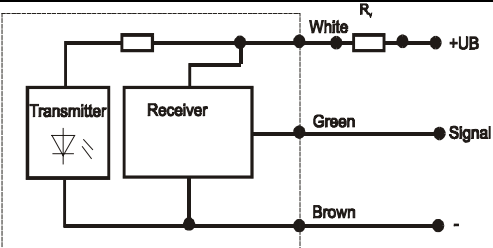
Note! Ensure that the voltage levels of your supply system are in agreement with that of flow meter.

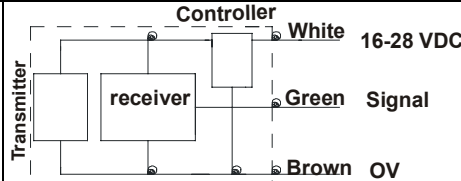
- Make sure that the electric supply lines are not active.
- Join the connection cable with your power supply cable, according to the connection plan shown below.
- We recommend a cross-sectional area of 0.25 mm² for the power supply cable.

Warning! A false connection of cable can lead to destruction of unit's electronics section

Version "O"		Connection plan
Feed voltage receiver	4.5 ... 16 V	
Feed current receiver	typ. 7 mA	
Signal amplitude High	approx. oper. voltage	
Signal amplitude Low	0.2 V	
Reverse voltage Sender	3.0 V max.	
Feed current Sender	30 mA ... 50 mA	
Output dissipation (power)	2.5 mW max.	

Version "K"		Connection plan	Ub	Rv
Feed voltage	see column Ub		5 V	220W/ 0.25 W
Feed current	40 ... 50 mA		8 V	430W/ 0.25 W
Signal amplitude High	approx. oper. voltage		12 V	680W/ 0.25 W
Signal amplitude Low	max. 0.2 V		15 V	910W/ 0.25 W
Output dissipation	2.5 mW max.			

Version "F"		Connection plan	Ub	Rv
Feed voltage	see column Ub		8 V	...
Feed current	40 ... 50 mA		12 V	180 Ω/ 0.25 W
Signal amplitude High	ca. 8 V		15 V	270 Ω/ 0.25 W
Signal amplitude Low	max. 0.2 V		24 V	680 Ω/ 0.25 W
Output dissipation	2.5 mW max.			

Model: DPL-FS...		Connection plan
Feed voltage	16 ... 28 V DC	
Feed current	25 ... 30 mA	
Signal amplitude High	Ub - 0.8 V	
Signal amplitude Low	max. 0.5 V	
Output dissipation	2.5 mW max.	

- After making connections of feed voltage and signal output, the unit is ready for operation.

9. Commissioning

- Please pay attention to the technical data of the flow meter.
- Pick a frequency value of flow meter from the following table:

Model	Meas. range Water (l/min)	approx. Pressure-loss at max. value (bar)	approx. Frequency at max. value (Hz)
DPL-005	0.025-0.5	0.77	272
DPL-018	0.05 -1.8	0.77	471
DPL-060	0.2-6	0.70	528
DPL-120	0.4-12	1.0	265
DPL-250	1-25	1.3	399

- Adjust your evaluation electronics to the pulse-rate indicated above. For devices with frequency divider electronics, pulse-rate must be divided by the factor indicated on the cable tag.
- In order to avoid pressure peaks, the flow medium should flow slowly into the device.

Frequency Divider

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Warning! Pressure peaks generated by sudden flow, caused by single solenoid valves, ball valves or the like, can lead to the destruction of the device (water hammer!). In the operating condition, it is to be made certain that the sensor is constantly filled with the medium.

Note! Larger bubbles in the measuring chamber can lead to measurement errors or destruction of bearings.

10. Maintenance

In case, the medium to be measured is not contaminated, the unit DPL is maintenance-free. In order to avoid problems, we recommend installation of a filter such as Magnet-filter, Model MF-R.

Should the cleaning of a device be deemed necessary, it can be done easily by removing housing cover and making the interior of housing accessible. Maintenance/repair work on device's electronics may only be carried out by the supplier, since otherwise, the warranty shall expire.

11. Technical Data

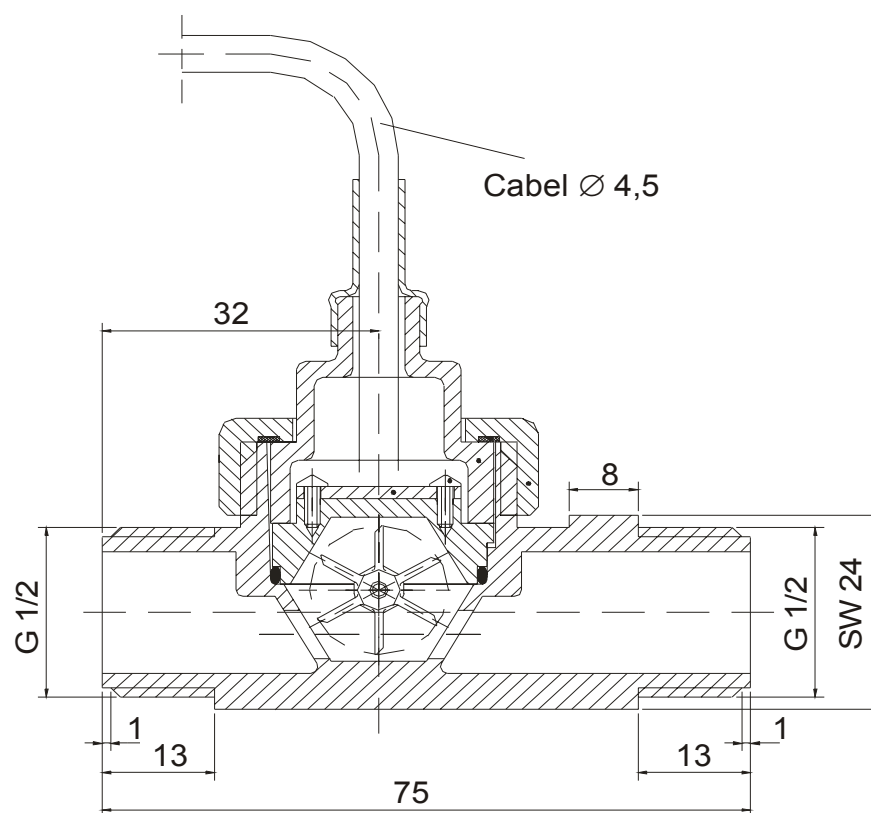
11.1. General

Max. oper. pressure:	10 bar
Temperature:	- 40°C ... + 70°C
Linearity:	± 1 %
Protection Cat.:	IP 65

11.2. Materials

Housing:	Polypropylene
Vane:	Polypropylene
Axle/Bearing:	Sapphire
Vane inlet:	Polysulfone
Sealing:	Perbunane,
Option:	Viton, EPDM

12. Dimensions



13. Declaration of Conformance

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

Rotating-vane Flow Meter DPL-FS...*

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

EN 50082-2 Electromagnetic Compatibility - Generic immunity standard (edition 2/1996)

- a) Electromagnetic compatibility, Electrostatic discharge immunity test (EN 61000-4-2, ESD, Level B)
- b) Electromagnetic compatibility, Electrical fast transient/burst immunity test (EN 61000-4-4, BURST, Level B)

Also the following EWG guidelines are fulfilled:

89/336/EWG



Signed:

H. Peters

M. Wenzel

date: 19.10.00

* The models DPL-O, DPL-K and DPL-F have no CE-conformity sign.
(OEM versions)