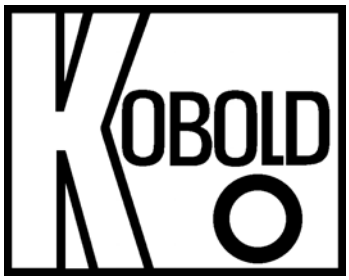
Operating Instruction

Low Volume

Flow Meter / Monitor

Model: KDF-../KDG-...



1. Note

Read these operating instructions before unpacking and operating. The devices should only be used, serviced and repaired by qualified personnel.

2. Contents

Manufactured and sold by:

Kobold Messring GmbH
Nordring 22-24
D-65719 Hofheim
Tel.: +49(0)6192-2990
Fax: +49(0)6192-23398
E-Mail: info.de@kobold.com
Internet: www.kobold.com

3. Specific Application

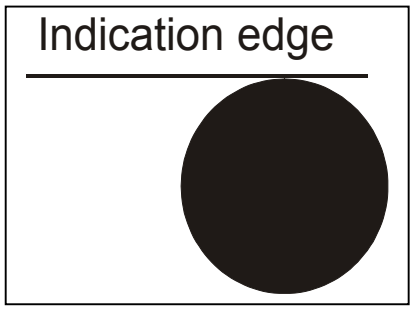
The model KDF devices serve to measure and monitor liquid flow, models KDG serve to measure and monitor gas flow.
Only clean, low viscosity and homogeneous liquids, against which the used materials are resistant, should be measured. Dirt particles may block the float and thus cause erroneous signals and measurements.

Standard Material Combinations

	Material combination brass	**Material combination stainless steel**
Measuring cone	Borosilicate glass	Borosilicate glass
Rotameter	POM, glass, titanium, stainless steel 1.4401 depending on instrument size)	POM, glass, titanium, stainless steel 1.4401 (depending on instrument size)
Float stop	PTFE	PTFE
Valve stem	CrNi steel 1.4571	CrNi steel 1.4571
Gaskets	Viton (standard) PTFE, FFKM (option).	Viton (standard) PTFE, FFKM (option).
Fitting (head and base part)	Brass	Precision casting, 1.4581
Fitting (track)	CrNi steel 1.4571	CrNi steel 1.4571

4. Method of Operation

The low volume flow meters and monitors, models KDF / KDG, work on the known principle of the rotameter flow meter. A float is situated in a cone-shaped measuring glass which is elevated by the inflowing medium. Every float level corresponds to a particular flow rate that can be read on the dial of the measuring glass. The flow rate is read off at the upper edge of the float.



Devices with a metallic float can be fitted with a limit switch to monitor flow rates. The limit switches are annular initiators mounted on the measuring glass that are switched inductively by the metallic float.
To maintain a constant flow rate at varying inlet or outlet pressure the devices can be delivered with optional differential pressure controllers.

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:

All parts in the delivery scope are mounted firmly on the device

6. Installation

Installation in the Pipeline

- The rotameter flow meter **must be fitted perpendicularly** (float measuring system). Direction of flow from bottom to top.
- Clean the pipeline to the device before connecting by blowing out or rinsing.
- The connection is made with unions suited for the model. The pipes should be connected to the ports of the measuring instrument, centric and as free of stress as possible. The piping should be supported if necessary, to prevent the transmission of vibrations to the measuring instrument.

Panel Mounting

- The panel cut-out should be prepared for panel mounting according to the drawing (see Sec. 14. Dimensions).

- Installation in the control panel: Both screws (1) on the front panel of the measuring instrument are loosened a bit, the device is inserted in the panel cut-out from the front, aligned and fixed with both screws (1).

7. Initial Operation

- The actual operating pressure and measuring temperature of the plant should not exceed the specified maximum values.
- Ensure material compatibility.
- Close needle valve on flow meter.
- Open shutoff valve upstream and downstream of measuring instrument.
- The pipeline should be carefully vented **for liquids.**

- Allow the operating pressure to increase slowly **for gases**. Avoid bouncing (danger of glass breaking).
- Open needle valve and set the desired flow rate.
- Should the operating parameters deviate from the calibration data (turn down ratio, measured medium, pressure, density and temperature), the measuring instrument can be adapted to the actual conditions. Use the conversion of the flow rate according to VDI/VDE guideline 3513.

8. Limit switches

To signal particular flow rates the low volume flow meters can be fitted with limit switches that initiate an electrical signal when the set value is reached. The float in the flow meter must be made of stainless steel. One signal transmitter is required for each limit value.

The following limit switch models are available:

- Bistable annular initiators RC 10-14-N3 (TG-10-1 bi) and RC 15-14-N3 (TG-15-1 bi).

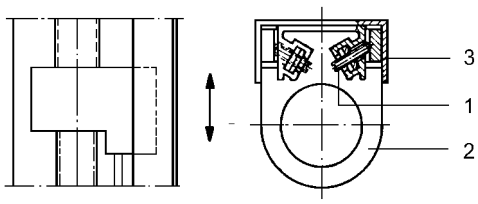
Bistable limit switches detect the direction of movement of the float when it passes by. The device can thus determine whether the float is above or below the annular initiator block. Bistable limit switches are delivered with connection box and built-in filter EMC-Y 38132 or EMC-Y38133.

- Monostable annular initiators RC 10-14-NO (TG-10-1) and RC 15-14-NO (TG-15-1).

The annular initiator is actuated when the metal float passes the annular initiator (wiper effect). No EMC filter is required for monostable limit monitors. A transistor relay should be connected on the load side for each switching circuit for operation. (For example: model REL-6000 or KHA6-SR2-EX- 2W)

Adjusting the Limit switch

The limit switch is adjusted for the desired flow rate by moving it. The limit switch (2) is fixed to the back track (3) of the measuring instrument with the two retaining screws (1).



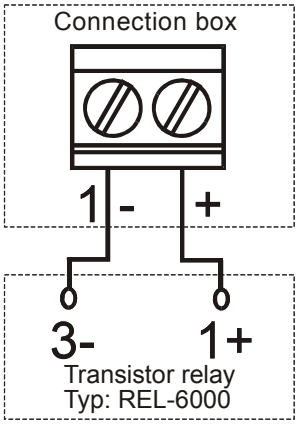
Please note that limit switches TG-15-1 or TG-15-1 bi as from the measuring range 100 l/h water and 3500 l/h air can only be used to approximately 50% of the max. measuring range because of the cone-shaped measuring glasses. Replace plexiglass protective cover after adjustment.

9. Electrical Connection

- Make sure that the electrical supply lines are not active.
- Install the supply line to the transistor relay according to the wiring diagram. The wiring diagram shown here is only valid for the transistor relay recommended by us. We cannot provide any details here for connecting the limit switch to a transistor relay from a different manufacturer.
- If the contact has not been adjusted yet, do so at this stage

Monostable

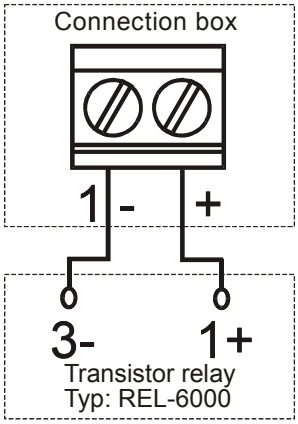
1 Limit switch



Connect limit value controller (+) brown cable (-) blue cable with transistor relay for devices without terminal box.

Bistable

1 Limit switch



10. Maintenance

Replacing the Measuring Cone'

- Close valve upstream and downstream of device!
- Devices, fitted in a control panel, must be removed. Close device valve!
- A no return valve is fitted in the device head in low volume flow meters to prevent liquids returning from the pipeline.

Important! The measuring instrument must be pressure free and free from aggressive and caustic media !

If necessary rinse device **thoroughly** and neutrally before **removal**.

- Push plexiglass protective cover upwards and remove to the front.
- Rotate spanner in base of device anti-clockwise to loosen the measuring glass; then remove the glass.
- Install in reverse order. To avoid breaking the glass in the measuring cone when clamping, the measuring glass must be installed centric between the gaskets.

11. Technical Specifications

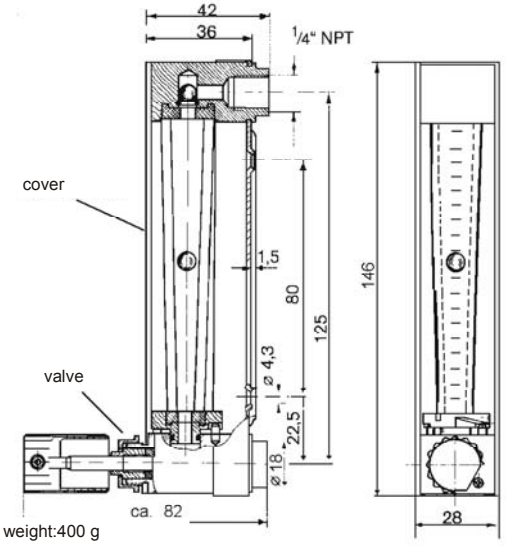
Span:	10:1
Accuracy:	2.5 according to VDI/VDE-conformance 3513, page 2
max. operating Pressure:	16 bar, (10 bar with PTFE gaskets)
max. Temperature:	100°C, (80°C with limit switch)
Connection:	2 x 1/4" NPT (at the back)
Data for contact device:	Nominal voltage: 8 VDC Current consumption: active surface bare: 3 mA active surface covered: 1 mA Protection: IP 67 Connection: 0.5 m PVC stranded cable (0.14 mm²)

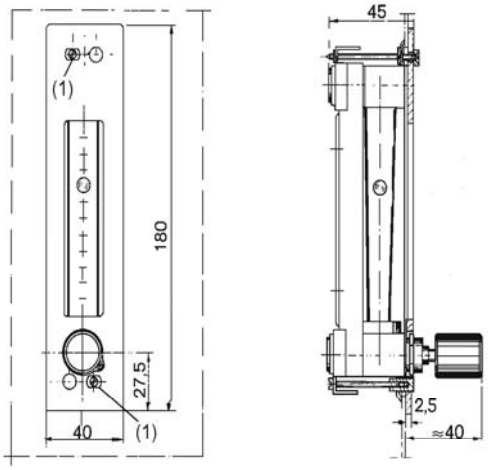
Electrical characteristic values according to DIN 19234 (Namur switching recommendations PTB individual approvals) available

12. Recommended spare parts

1) Measuring glass (specify measuring range, medium, service conditions)
2.1) Viton set of gaskets for measuring glass
2.2) PTFE set of gaskets for measuring glass
3) Protective cover
4.1) Limit switch TG 10-1
4.2) Limit switch TG 10-1 bi
4.3) Limit switch TG 15-1
4.4) Limit switch TG 15-1bi

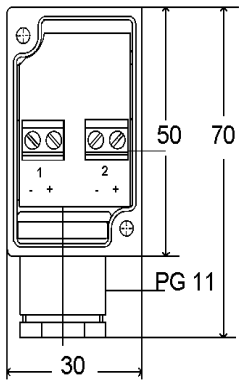
13. Dimensions





approx. 30 mm
switch panel cross-section:163x32 mm

PG-connection
box
with EMV-Filter



Installation of connection box
a) devices without switch panel building block: below
b) devices with switch panel building block: back

14. Declaration of Conformance

We, KOBOLD Messring GmbH, Hofheim/Ts, Germany, declare that the product

Low volume flow meter / monitor model KDF-... / KDG-...
with limit monitor model TG-10-1, TG-15-1

complies with the standards listed below:

EN 50081-1
Electromagnetic compatibility (EMC) - Basic Specification Emitted Interference

EN 50082-2
Electromagnetic compatibility (EMC) - Basic Specification Noise Immunity

and satisfies the following EWG guideline:
89/336 EWG

Signature Date: 21/01/1997

K. Kobold