Operating Instructions

for

Flow Monitor

Model: DF-...Hxx3K
DF-...IHx3K
DF-...KLxxx
DF-...DLxxx
DF-...ZLxxx

1. Contents

Manufactured and sold by:

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

2. Note

2.1 General

Before unpacking and commissioning the device, the operating instructions and the “General Safety Instructions” document must be read and followed carefully. The general safety instructions, the operating instructions, the data sheet as well as approvals and further information can be downloaded via the QR code on the device or under the respective product on www.kobold.com.

Due to technical changes, the device documentation available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email (info.de@kobold.com) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form.

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

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 device should be used only when the entire machine fulfils the EU machinery directive.

2.2 Hazard warnings

The following instructions are intended to ensure your personal safety and to prevent damage to the product described or connected devices. Safety instructions and warnings to prevent danger to the life and health of users or maintenance personnel, or to prevent damage to property, are highlighted in this documentation using the symbols defined here. *The symbols and terms used have the following meaning in the documentation itself:*

Symbol	Explanation	Symbol	Explanation
 Note	Is important information about the product, the handling of the product or the respective part of the documentation to which particular attention should be drawn.	 Caution	Means that minor personal injury or minor property damage may occur if proper precautions are not taken.

Symbol	Explanation	Symbol	Explanation
 Warning	Indicates that serious personal injury or substantial property damage may occur if proper precautions are not taken.	 Danger	Means that death can occur if proper precautions are not taken.
 Warning	Attention: Hot surface!	 Warning	Warning: Dangerous electrical voltage

2.3 As per PED 2014/68/EU

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

	Pipe	
	Table 8 Group 1 dangerous fluids	Table 9 Group 2 no dangerous fluids
All DF-models except DF-xxG(H)R32 DF-xxG(H)R40	Art. 4, § 3	Art. 4, § 3
DF-xxGR32../DF-xxGR40	not deliverable	Art. 4, § 3
DF-xxHR32../DF-xxHR40..	Cat. II	Art. 4, § 3
DF-xxHF50..	Cat II	Art. 4, § 3

3. Instrument Inspection

Instruments are inspected before shipping and sent out 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:

- Sensor housing with mounted connection box or electronics

4. Regulation Use

The units of model DF are used for measurement of liquid flow. Only low viscosity fluids which are chemically compatible with the materials used in the sensor housing are allowed to be measured. If using higher viscosity media, large measuring errors can occur. Long threads can lead to the seizure of the rotor. Likewise, ferritic particles can build up on the rotating vane and lead to faulty operation or destruction of the rotor. If in doubt, please contact the supplier.

Material Combinations

Standard version					**High-pressure version**	
Material combination	I	II	III	IV[1)]	VI[1)]	VII[1)]
Order code	**..A..**	**..B..**	**..D..**	**..E..**	**..G..**	**..H..**
Connection types	Pipe thread	Pipe thread	Pipe thread	Pipe thread flange	Pipe thread	Pipe thread flange
Case	Trogamide	Polysulfone	Brass nickel-plated	St. steel[4)]	Brass nickel-plated	St. steel[4)]
Cover	Trogamide	Polysulfone	Polysulfone	Polysulfone	Brass nickel-plated	St. steel[4)]
Connection	Brass nickel-plated	St. steel[4)]	Brass nickel-plated	St. steel[4)]	Brass nickel-plated	St. steel[4)]
Locking pins	Brass	Brass	Brass	-	-	-
O-rings	NBR	FPM	NBR	FPM	NBR	FPM
Vane	POM	PTFE	POM	PTFE	POM	PTFE
Axle[3)]	St. steel[4)]	St. steel[4)]	St. steel[4)]	St. steel[4)]	St. steel[4)]	St. steel[4)]
Bearing[3)]	PTFE	PTFE	PTFE	PTFE	PTFE	PTFE
Screen	PTFE[2)]	PTFE[2)]	PTFE[2)]	PTFE[2)]	PTFE[2)]	PTFE[2)]
Max. operating pressure	10 bar	10 bar	16 bar	16 bar	100 bar	100 bar flange PN 40
Max. operating temperature	60 °C	80 °C	80 °C	80 °C	80 °C	80 °C

1) Connection cannot be rotated
2) Stainless St. for model DF 0.5
3) Special version upon request
4) Stainless St.1.4571, 1.4404

5. Operating Principle

KOBOLD measuring sensors are available with pipe thread or flange connections; standard or high-pressure versions are optional. The standard version is delivered with a standard front cover from solid, transparent plastic, which allows the flow to be optically inspected. The rotary motion of the shining red vane can be clearly seen. Faults such as power failure or rotor blockage can thus be quickly detected in situ. In addition to their use as measuring and monitoring systems, the devices can also be used as flow indicators.
The standard front cover is replaced by a metal plate on the high-pressure version (up to 100 bar with the threaded version). The devices can be installed in any position. However, the flow must always be in the direction of the arrow, and the front panel of the device must be arranged in the vertical plane. The fluidic housing must be full with liquid. Additional inlet or outlet pipes are not required. The large radial clearance between vane and housing wall renders the measuring sensor insensitive to dirt. Depending on the version, the connection fittings can be rotated and are bearing mounted. Switching electronics or vane front may be rotated at will for ease of viewing (while in service).

The KOBOLD measuring sensors are also available without a compact electronic. The linear flow proportional pulse signal provided by the sensor can be controlled by customer own electronics. The customer is able to integrate the sensor directly into the electronics with the OEM-version (implement EMC-immunity) and can therefore save costs and material.

6. Mechanical Connection

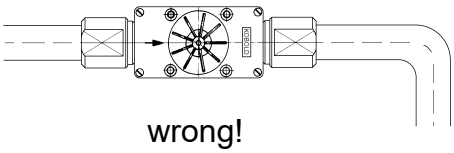
Before installation

- Please make sure that the actual flow throughput matches the flow range of the instrument. The flow range may be read from the label.

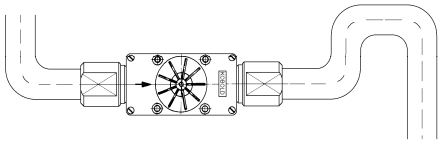
 Caution	Warning! If the measuring range is exceeded by more than 20%, bearing damage may occur.

- Please make sure that the allowable maximum operating pressure and operating temperature of the instruments are not exceeded.
- Make sure that the electrical supply to the instrument conforms to the equipment operating data (see label).
- Remove all transport packing and make sure that no packing material is left in the instrument.

- The instrument may be installed in any position. However, the flow must always take place in the direction of the arrow, while the front face of the instrument must always be in the vertical plane.
- It must be ensured that the instrument housing is continuously filled with the flow medium, especially for flows from top to bottom. No straight runs are necessary at inlet and outlet.
- Sealing of the connection threads should be carried out with PTFE tape or similar.
- During installation of the instrument, it must be checked that no stress is applied to the connections. We recommend that the inlet and outlet pipes are mechanically fixed approximately 50 mm from each instrument connection.
- When using Material Combination V (PTFE) the instrument connections may not be rotated.
- Check that the connection thread to pipe is fully sealed.



wrong!



right!

Caution	Warning! The threaded connections of the instrument must be tightened with a suitable sized open-ended spanner. Otherwise, the housing may be stressed which could lead to breakage of the equipment.

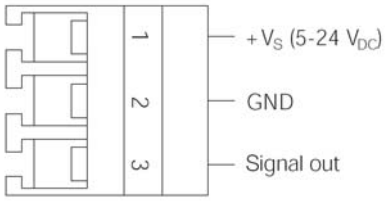
Caution	Warning! The material polysulfone (order code B) tends to cause stress cracks if unsuitable cleaning or sealing agents are used. Only agents suitable for polysulfone may be used during assembly or cleaning.

7. Electrical Connection

7.1 DF-…Hxx3K, DF-…IHx3K

NOTE Note	Attention! Make sure that the voltage value of your instrument is between 5 and 24 VDC.

- Make sure that the supply wires are de-energised.
- Connect the 3-pole connection clamp in accordance with the wiring diagram.



Cable Connection

red = +V_S
blue = GND
yellow = Signal out

Caution	Attention! Incorrect wiring will lead to damage of the unit's electronics.

7.2 DF-…KLxxx, DF-…ZLxxx, DF-…DLxxx

Note	Attention! Make sure that the voltage value of your instrument is 24 VDC.

- Make sure that the supply wires are de-energised.
- Connect the wires in accordance with the wiring diagram.

Wire number	DF-…KLxxx	DF-…ZLxxx	DF-…DLxxx
1	+24 V_{DC}	+24 V_{DC}	+24 V_{DC}
2	GND	GND	GND
3	4-20 mA	4-20 mA	4-20 mA
4	GND	GND	GND
5	relay S1 N/O	d.c. *)	Ctrl 1 *)
6	relay S1 COM	Reset TM *)	Ctrl 2 *)
7	relay S1 N/C	relay S1 N/O	relay S1 N/O
8	relay S2 N/O	relay S1 COM	relay S1 COM
9	relay S2 COM	relay S2 N/O	relay S2 N/O
10	relay S2 N/C	relay S2 COM	relay S2 COM

*) d.c. = Don't connect wire!
Reset TM = Reset part quantity
Ctrl 1 -- GND => Start
Ctrl 2 -- GND => Stop
Ctrl 1 -- Ctrl 2 -- GND => Reset dosage

Caution	Attention! Incorrect wiring will lead to damage of the unit's electronics.

8. Mechanical Commissioning

To avoid pressure surges, the flow medium should be slowly introduced into the instrument.

 Caution	Attention! Pressure surges from solenoid valves, ball valves or similar may result in damage to the instrument (water hammer). In the operating condi¬tion it must be checked that the instrument housing is continuously filled with the flow medium. Large air bubbles in the instrument housing can lead to meas-uring errors or destruction of the bearings.

9. Operation

DF-...KLxxx
See Operating Instructions ZED-K

DF-...ZLxxx
See Operating Instructions ZED-Z

DF-...DLxxx
See Operating Instructions ZED-D

10. Maintenance

The DF-..HN.. and DF-..HP.. instrument is maintenance-free for measured media without contamination. Since the paddlewheel contains magnets, any ferritic particles present in the medium may lead to problems. In order to avoid such problems, we recommend the installation of a magnet filter (e.g. the magnet filter, model MF-R). Should cleaning of the instrument become necessary, the housing cover may easily be removed to provide access to the interior. Any work on the electronics may only be undertaken by the supplier; otherwise, the warranty will become invalid.

11. Technical Information

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

12. Order Codes

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

13. Dimensions

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

14. Recommended Spare Parts

Rotating vane	1.1) PTFE	1.2) POM	1.3) PTFE with saphire bearing
Axle / bearing	2.1) St. St./PTFE	2.2) Ceramic/PTFE	2.3) Saphire/Saphire (only for 1.3)
Cover for sensor housing	3.1) Trogamide	3.2) Polysulfone	
Cover for electronic housing.	4.1) NBR		
O-rings	5.1) NBR	5.2) FPM	

Please specify serial number when ordering spare parts.

15. Disposal

See “General Safety Instructions” - via the QR code on the device or via www.kobold.com

16. EU Declaration of Conformance

We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the products:

Flow Transmitter	**Model: DF-..HN.. and DF-..HP..**
Flow Meter	**Model: DF-…KLxxx**
Flow Counter	**Model: DF-…ZLxxx**
Dosing Unit	**Model: DF-…DLxxx**

to which this declaration relates are in conformity with the following EU directives stated below:

2014/30/EU Electromagnetic Compatibility
2011/65/EU **RoHS** (category 9)
2015/863/EU Delegated Directive (RoHS III)

Additional for DF-xxHR32../DF-xxHR40.. und DF-xxHF50..:

2014/68/EU PED

- Category II, Diagram 8, piping, group 1 dangerous fluids
- Module A2

Also, the following standards are fulfilled:

EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Additional for DF-..HN.. and DF-..HP..:

EN 61000-4-4:2012
Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test, Burst 2 kV

Additional for DF-...KLxxx, DF-...ZLxxx, DF-...DLxxx:

EN IEC 61326:2021
Electrical equipment for measurement, control and laboratory use – Part 1: General requirements, Industrial area (measurement of immunity to HF field up to 1 GHz)

Additional for DF-xxHR32../DF-xxHR40.. and DF-xxHF50..:

AD 2000 Pamphlets

Hofheim, 15 Jan. 2026

H. Volz
General Manager

J. Burke
Compliance Manager

17. UK Declaration of Conformity

We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the products:

Flow Transmitter	**Model: DF-..HN.. and DF-..HP..**
Flow Meter	**Model: DF-…KLxxx**
Flow Counter	**Model: DF-…ZLxxx**
Dosing Unit	**Model: DF-…DLxxx**

to which this declaration relates are in conformity with the following UK directives stated below:

S.I. 2016/1091 **Electromagnetic Compatibility Regulations 2016**
S.I. 2012/3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Additional for DF-xxHR32../DF-xxHR40.. und DF-xxHF50..:

S.I. 2016/1105 **The Pressure Equipment (Safety) Regulations 2016**
- Category II, Diagram 8, piping, group 1 dangerous fluids
- Module A2

Also, the following standards are fulfilled:

BS EN IEC 63000:2018
Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

Additional for DF-..HN.. and DF-..HP..:

BS EN 61000-4-4:2012
Electromagnetic compatibility (EMC). Testing and measurement techniques. Electrical fast transient/burst immunity test, Burst 2 kV

Additional for DF-...KLxxx, DF-...ZLxxx, DF-...DLxxx:

BS EN IEC 61326-1:2021
Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements, Industrial area (measurement of immunity to HF field up to 1 GHz)

Additional for DF-xxHR32../DF-xxHR40.. and DF-xxHF50..:

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Hofheim, 15 Jan. 2026

H. Volz
General Manager

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