Operating Instructions

for

Oval Gear Wheel Meter

Model: OVZ

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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 instruction manuals on our website www.kobold.com are always for currently manufactured version of our products. Due to technical changes, the instruction manuals 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 against an applicable postage fee.

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.

By usage in machines, the measuring unit should be used only when the machines fulfil the EC-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.
Diagram 8, Pipe, Group 1 dangerous fluids

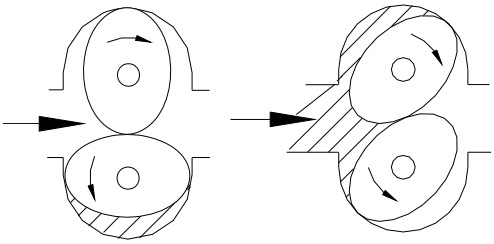
3. Regulation Use

The model OVZ is an oval gear, positive displacement flowmeter which can be used to measure and monitor the flowrate of viscous liquid (min. 10 mm²/s to max. 800 mm²/s); (max. viscosity 1000 mm²/s upon request). Only measure clean, non-abrasive liquids with adequate lubricating properties, and against which the materials used in the sensor case are chemically resistant. Ferrite particles may become deposited on the oval gears as they do contain permanent magnets, - thus causing maloperation, or destruction of the oval wheel. We recommend our model MFR magnetic filter if the liquid contains a high concentration of ferrous solids. In case of uncertainty, please consult your supplier.

Material combinations

Model	OVZ-..1..	OVZ-..2..	OVZ-..3..	OVZ-..4..	OVZ-..5..
Case	POM	POM	Aluminium	Aluminium	Aluminium
Case cover	POM	PMMA	PMMA	PSU	Aluminium
Axle	Stainless steel 1.4301				
Rotating sensing targets	Ceramics (Hall sensor versions) stainless steel (inductive pickup versions)				
Oval gears	POM				
Gaskets	Standard: NBR; option: FPM or EPDM				
max. operating pressure	10 bar	10 bar	16 bar	16 bar	40 bar
max. medium temperature	-10 to +80 °C				
max. ambient temperature	-10 to +60 °C				
Filtration requirements	max. 30 µm				

4. Operating Principle



The OVZ oval wheel meter is a positive-displacement flowmeter. The measuring element comprises two toothed precision oval gearwheels, which are driven by the liquid inlet pressure. As the liquid rotates the gears, a fixed quantity of liquid is transported through the chambers for every turn of the oval-wheel pair. Permanent magnets or stainless steel pins are embedded in the oval gear-wheels. The rotary gear motion is converted to a pulse signal by electrical sensors externally fitted into the casing. The pulse count is a measure of the flow rate. The signals are evaluated by downstream electronics (optional).

5. Instrument Inspection

Instruments are inspected before shipping and sent out 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:

- Oval wheel meter model: OVZ

6. Mechanical Connection

Before installation:

- Make sure that the actual flow rate corresponds with the measuring range of the meter.
- Make sure that the approved maximum operating pressure and operating temperature of the meter are not exceeded.
- Remove all transport restraints and ensure that there are no pieces of packaging left in the meter.
- Make sure that there are no welding beads, metal filings, or other pollutants, in the piping. We strongly recommend you to connect a suitable filter in series (filtration $\leq$ 30 μm).

Installation:

- The OVZ may be installed in any position; the liquid may flow in both directions.
- Inlet and outlet pipes are not required.
- The connection threads may be sealed with sealing tape etc.
- When installing the meters, make sure that the connection threads are not subjected to large pressure or tensile loads. We recommend that you mechanically secure the inlet and outlet line approximately 50 mm from the connections.
- If possible, you should check that the joint connections are sealed and leak-free after mechanical installation.

7. Electrical Connection

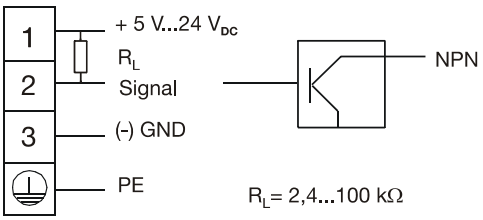
7.1. General

Important! Make sure that the voltages in your plant correspond with the voltages on the nameplate.

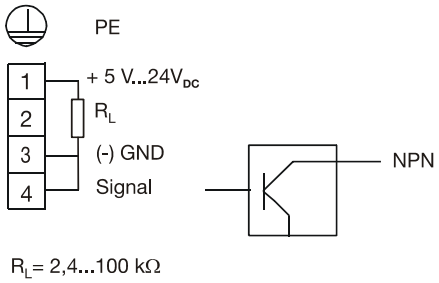
- Make sure that the electrical supply lines are dead.
- Meters with connectors: solder the ends of the connection cable according to the wiring diagram in the accompanying portable socket-outlets.
- Meters with cable connections: connect the connection cable with the supply cable.

Important! If the connections are incorrectly assigned, the sensor may be seriously damaged.

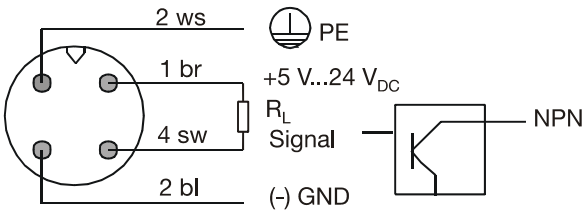
DIN-43650 Plug (OVZ-...l401)



Al-housing / Pg 9(OVZ-...l302)

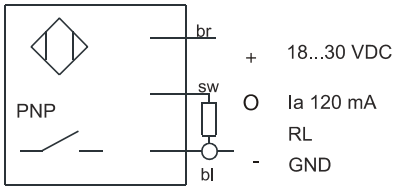


Al-Housing / Round plug (OVZ-...l303)



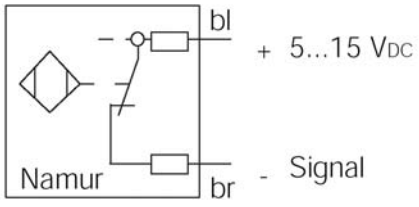
RL= 2,4...100 kΩ

PNP (OVZ-...l304)



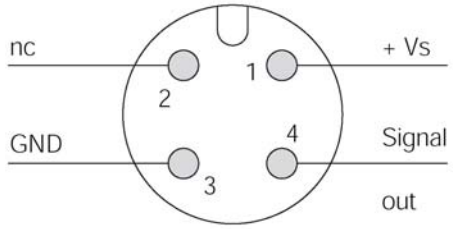
RL= 2,4...100 kΩ

NAMUR (OVZ-...l305)



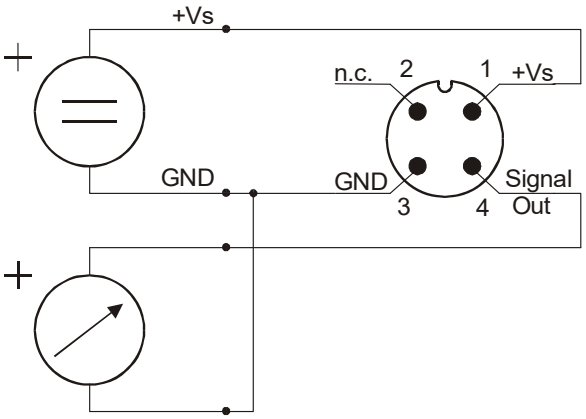
7.2. Evaluation electronics:

Frequency output (OVZ-...F300; ...F3x0)

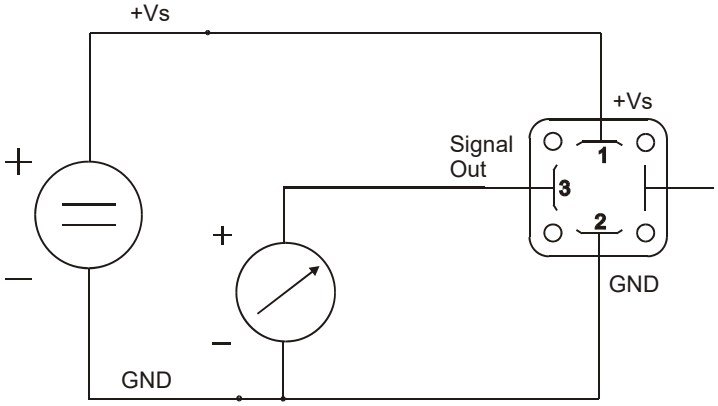


7.3. Evaluation electronics: analogue output (..L..)

3-wire (OVZ-...L303; ...L343)



3-wire, DIN 43650-plug (OVZ-...L443)



7.4. Compact electronics:

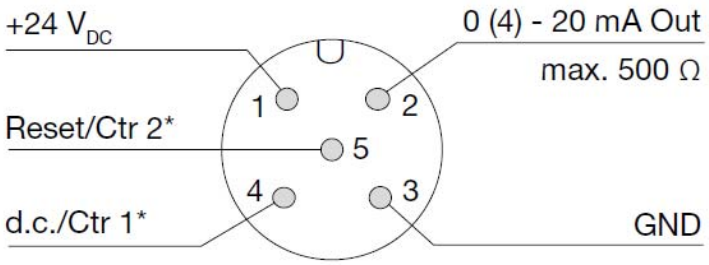
(..C30r, ..C30M, ..C34P, ..C34N)
see instruction manual-addition for compact electronics with frequency output.

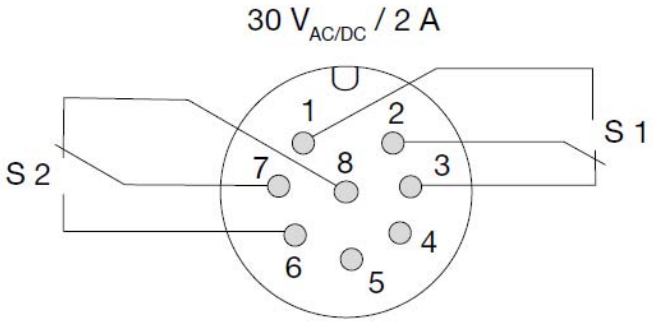
7.5. OVZ-…E14R, OVZ-…G14 Cable connection

Wire number	OVZ-…E14R Counter electronics	OVZ-…G14R Dosing electronics
1	+24 VDC	+24 VDC
2	GND	GND
3	4-20 mA	4-20 mA
4	GND	GND
5	n.c.	Control 1*
6	Reset part quantity	Control 2*
7	Relay S1	Relay S1
8	Relay S1	Relay S1
9	Relay S2	Relay S2
10	Relay S2	Relay S2

Control 1 <-> GND: Start-Dosing
Control 2 <-> GND: Stop-Dosing
Control 1 <-> Control 2: Reset-Dosing

Plug connection





8. Operation – evaluation electronics

8.1. Frequency output

The instruments are pre-adjusted. After electrical connection they are ready for operation.

8.2. Analogue output

The instruments are pre-adjusted. After electrical connection they are ready for operation.

8.3. Compact electronics

The instruments are pre-adjusted. After electrical connection they are ready for operation.
For changing of setting refer
to operating manual for
compact electronic with frequency output

9. Mechanical Operation

- To avoid pressure peaks, the flow medium should flow slowly into the meter.

Important! Pressure peaks arising from a sudden influx of liquid, caused by solenoid valves, ball valves etc, may seriously damage the meter (water hammer!). Ensure that the sensor is always filled with medium when in the operating state.

Important! Vent the piping, to prevent large air bubbles in the sensor chamber which may cause measuring errors, erratic flow reading and can possibly seriously damage the bearings.

10. Technical Information

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

11. Order Details

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

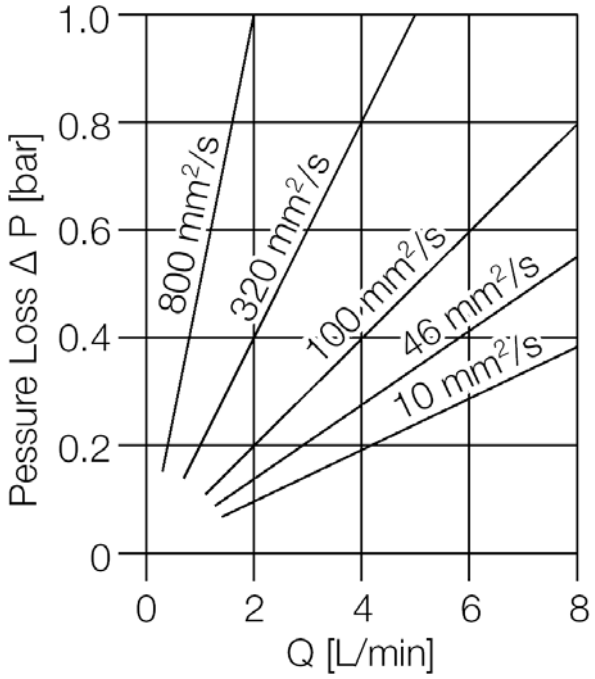
12. Dimensions

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

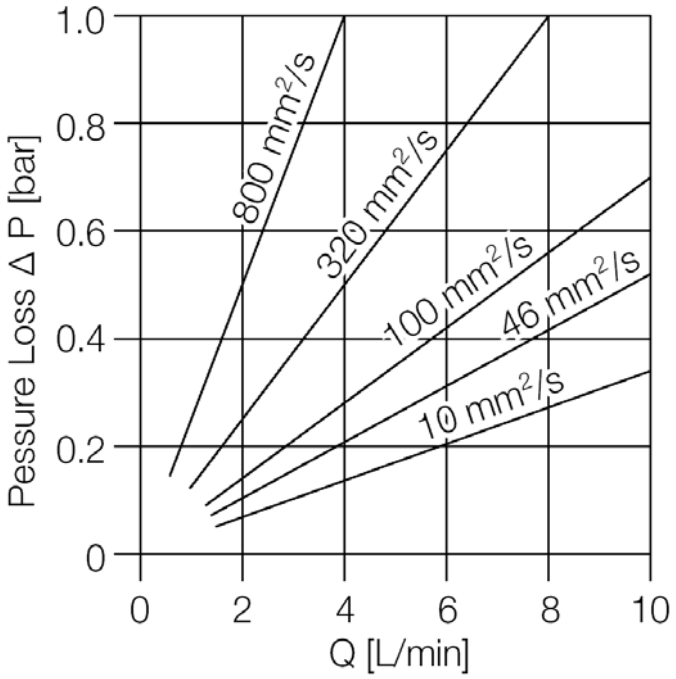
13. Pressure loss

13.1. POM- plastic housing

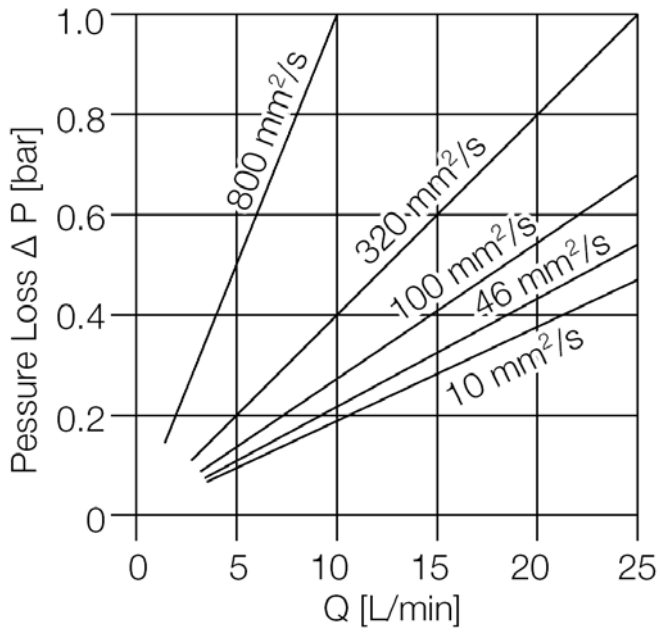
OVZ-02...



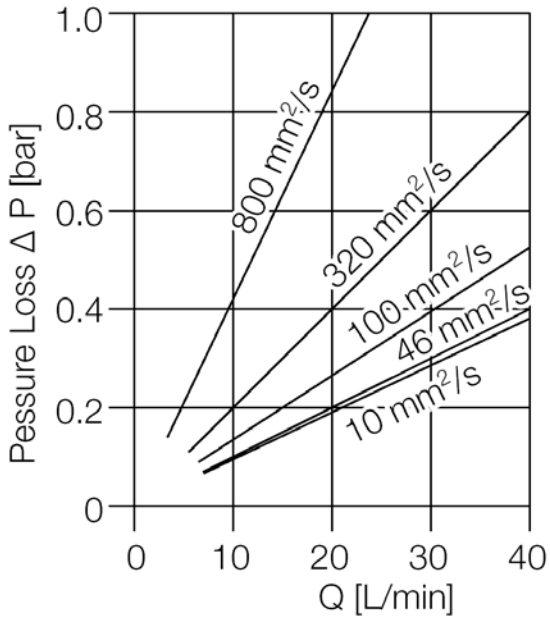
OVZ-04...



OVZ-15...

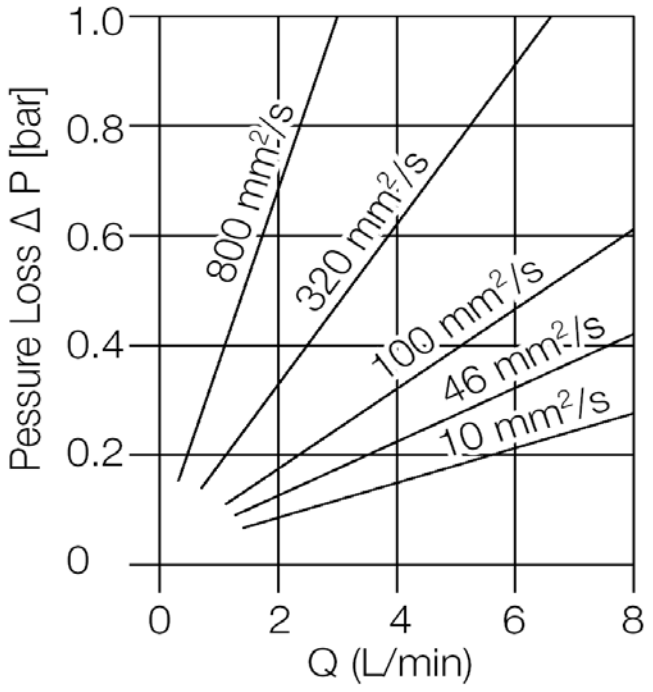


OVZ-30...

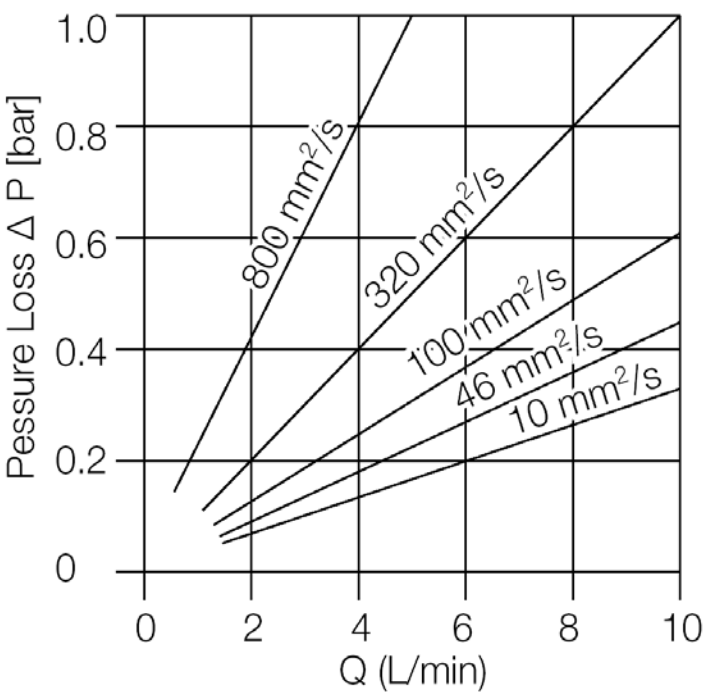


13.2. Aluminium housing

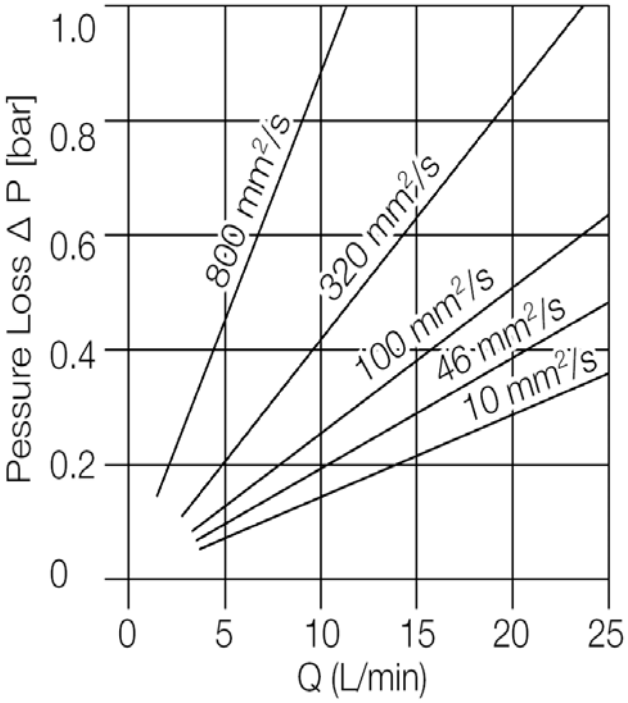
OVZ-02...



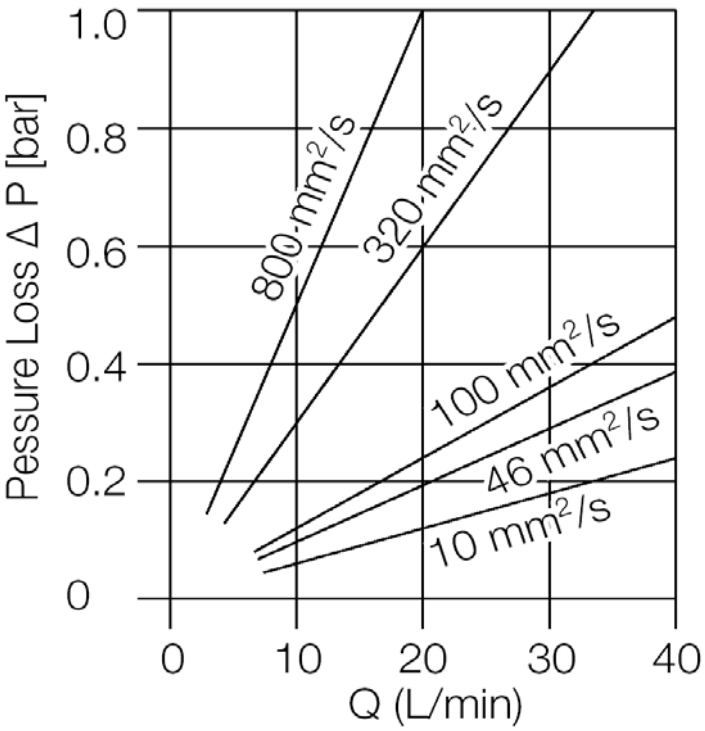
OVZ-04...



OVZ-15...


Pessure Loss Δ P [bar]
1.0
0.8
0.6
0.4
0.2
0
0
5
10
15
20
25
Q (L/min)
800 mm²/s
320 mm²/s
100 mm²/s
46 mm²/s
10 mm²/s

OVZ-30...


Pessure Loss Δ P [bar]
1.0
0.8
0.6
0.4
0.2
0
0
10
20
30
40
Q (L/min)
800 mm²/s
320 mm²/s
100 mm²/s
46 mm²/s
10 mm²/s

14. Maintenance

The meter requires no maintenance if the measured medium is not contaminated. Should it be necessary to clean the meter, the case cover can be easily removed to gain access to, and clean, the inside of the case (see Sec. 12. Dismantling /Installation).

15. Dismantling / Installation

Dismantling:

- Drain piping.
- Loosen cover screws and remove cover and O-ring.
- Mark the position of the gearwheels relative to one another with a pencil.
- Remove the pair of oval gearwheels and clean parts with care; do not scratch the sealing faces.

Caution: Do not remove the gearwheel position marking!

Installation:

- Install the pair of oval gearwheels; note identifying marking.
- Rotate gearwheels a number of times: they should not disengage.
- Insert O-ring; replace cover and firmly tighten screws crosswise to the specified torque.

Size	Thread	Tightening torque (Nm)
OVZ-02 **OVZ-04**	M6	6
OVZ-15	M10	32
OVZ-30	M12	56

16. Recommended spare parts

1.0 Pair of oval gearwheels
2.0 NBR, FPM, or EPDM O-ring
3.0 POM, PMMA, PSU, or AL cover

Always specify the meter model when ordering spare parts.

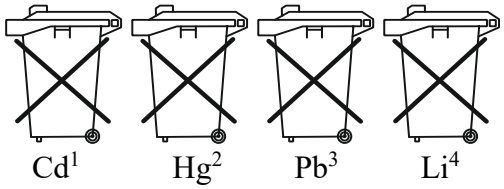
17. Disposal

Note!

- Avoid environmental damage caused by media-contaminated parts
- Dispose of the device and packaging in an environmentally friendly manner
- Comply with applicable national and international disposal regulations and environmental regulations.

Batteries

Batteries containing pollutants are marked with a sign consisting of a crossed-out garbage can and the chemical symbol (Cd, Hg, Li or Pb) of the heavy metal that is decisive for the classification as containing pollutants:



1. „Cd" stands for cadmium
2. „Hg" stands for mercury
3. „Pb" stands for lead
4. „Li" stands for lithium

Electrical and electronic equipment

18. EU Declaration of Conformance

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

Oval Gear Wheel Meter Model: OVZ-...

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

2011/65/EU **RoHS** (category 9)
2015/863/EU Delegated Directive (RoHS III)

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

Additionally for devices with compact electronics ...C…:

2014/30/EU **EMC Directive**

EN IEC 61326-1:2021 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements, industrial area

Additionally for devices with frequency output ..F…, analogue output ..L…, counter electronic ..E… and dosing electronics ..G…:

2014/30/EU **EMC Directive**

EN IEC 61326-1:2021 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements, industrial area, measurement of interference immunity to HF fields up to 1 GHz

Additionally for devices with frequency output ..I…:

2014/30/EU **EMC Directive**

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

Hofheim, 19 October 2023

H. Volz
General Manager

J. Burke
Compliance Manager

19. UK Declaration of Conformity

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

Oval Gear Wheel Meter Model: OVZ-...

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

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

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.

Additionally for devices with compact electronics ...C…:

S.I. 2016/1091 Electromagnetic Compatibility Regulations 2016

BS EN IEC 61326-1:2021 Electrical equipment for measurement, control and laboratory use. EMC requirements - General requirements, industrial area

Additionally for devices with frequency output ..F…, analogue output ..L…, counter electronics ..E… and dosing electronics ..G…:

S.I. 2016/1091 Electromagnetic Compatibility Regulations 2016

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

Additionally for devices with frequency output ..I…:

S.I. 2016/1091 Electromagnetic Compatibility Regulations 2016

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

Hofheim, 10 October 2023

H. Volz
General Manager

J. Burke
Compliance Manager