

Type 8071

Flowmeter with oval rotors
Durchfluss-Messgerät mit Ovälradern
Débitmètre à roues ovales



Operating Instructions

Bedienungsanleitung
Manuel d'utilisation

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1 ABOUT THIS MANUAL

This manual describes the entire life cycle of the device. Please keep this manual in a safe place, accessible to all users and any new owners.

This manual contains important safety information.

Failure to comply with these instructions can lead to hazardous situations.

- ▶ This manual must be read and understood.

1.1 Symbols used



DANGER

Warns against an imminent danger.

- ▶ Failure to observe this warning can result in death or in serious injury.



WARNING

Warns against a potentially dangerous situation.

- ▶ Failure to observe this warning can result in serious injury or even death.



ATTENTION

Warns against a possible risk.

- ▶ Failure to observe this warning can result in substantial or minor injuries.

NOTE

Warns against material damage.

- ▶ Failure to observe this warning may result in damage to the device or system.



Indicates additional information, advice or important recommendations.



refers to information contained in this manual or in other documents.

→ Indicates a procedure to be carried out.

1.2 Definition of the word "device"

The word "device" used within this manual refers to the flow-meter type 8071.

2 INTENDED USE

Use of the device that does not comply with the instructions could present risks to people, nearby installations and the environment.

- ▶ The device is intended to measure the flow rate of fluids, especially of viscous fluids.
- ▶ This device must be protected against electromagnetic interference, ultraviolet rays and, when installed outdoors, the effects of climatic conditions.
- ▶ This device must be used in compliance with the characteristics and commissioning and use conditions specified in the contractual documents and in the user manual.
- ▶ Requirements for the safe and proper operation of the device are proper transport, storage and installation, as well as careful operation and maintenance.
- ▶ Only use the device as intended.

→ Observe any existing restraints when the device is exported.

3 BASIC SAFETY INFORMATION

This safety information does not take into account:

- any contingencies or occurrences that may arise during installation, use and maintenance of the devices.
- the local safety regulations that the operator must ensure the staff in charge of installation and maintenance observe.



Danger due to high pressure in the installation.

Danger due to electrical voltage.

Danger due to high temperatures of the fluid.

Danger due to the nature of the fluid.



Various dangerous situations

To avoid injury take care to:

- ▶ Prevent any unintentional power supply switch-on.
- ▶ Ensure that installation and maintenance work are carried out by qualified, authorised personnel in possession of the appropriate tools.



Various dangerous situations

To avoid injury take care:

- ▶ to guarantee a set or controlled restarting of the process, after a power supply interruption.
- ▶ to use the device only if in perfect working order and in compliance with the instructions provided in the instruction manual.
- ▶ to observe the general technical rules when installing and using the device.
- ▶ not to use the device in an explosive atmosphere.
- ▶ not to use this device in an environment incompatible with the materials it is made of.
- ▶ not to use fluid that is incompatible with the materials the device is made of.
- ▶ not to use the device for the measurement of gas flow rates.
- ▶ not to subject the device to mechanical loads (e.g. by placing objects on top of it or by using it as a step).
- ▶ not to make any external modifications to the device. not to paint or varnish any part of the device.

NOTE

The device may be damaged by the fluid in contact with.

- ▶ Systematically check the chemical compatibility of the component materials of the device and the fluids likely to come into contact with it (for example: alcohols, strong or concentrated acids, aldehydes, alkaline compounds, esters, aliphatic compounds, ketones, halogenated aromatics or hydrocarbons, oxidants and chlorinated agents).

NOTE

Elements / Components sensitive to electrostatic discharges

This device contains electronic components sensitive to electrostatic discharges. They may be damaged if they are touched by an electrostatically charged person or object. In the worst case scenario, these components are instantly destroyed or go out of order as soon as they are activated.

- ▶ To minimise or even avoid all damage due to an electrostatic discharge, take all the precautions described in the EN 61340-5-1 and 5-2 norms.
- ▶ Also ensure that you do not touch any of the live electrical components.

4 GENERAL INFORMATION

4.1 Contacts

Bürkert SAS

Rue du Giessen

BP 21

F-67220 TRIEMBACH-AU-VAL

You may also contact your local Bürkert sales office.

The addresses of our international sales offices are available on the internet at: country.burkert.com

4.2 Warranty conditions

The condition governing the legal warranty is the conforming use of the device in observance of the operating conditions specified in this manual.

4.3 Information on the Internet

You can find the user manuals and technical data sheets regarding the type 8071 at: country.burkert.com

5 DESCRIPTION

5.1 Area of application

The device is intended to measure, thanks to its oval rotors, the flow rate of viscous fluids. It must be combined with a remote instrument (such as transmitter type 8025 Universal or batch controller type 8025 Batch) which converts the pulse frequency due to oval rotors rotation.

5.2 General description

5.2.1 Construction

The device is built of a fitting which includes oval rotors and of a cover including the electronic module with Hall effect sensor and Reed switch.

The oval rotors of the fitting contain magnets.

All the device versions provide an NPN transistor output and a Reed switch output.

The electrical connection is made by a 1 meter 5-wire cable.

5.2.2 Measuring principle

When the fluid flows through the pipe, the oval rotors which contain magnets turn (see Fig. 1). The displacement of magnets lead to a variation of magnetic field. The sensor measures the variation of the magnetic field and converts the signal into a frequency. The frequency is available at both the NPN transistor and Reed switch outputs.

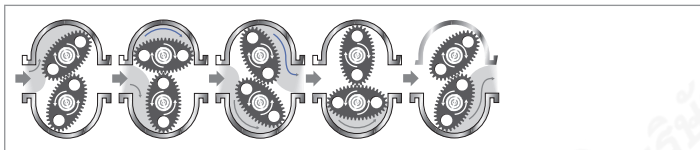


Fig. 1 Running/displacement of oval rotors

The remote instrument converts the frequency into a flow rate by using the correct K factor.

5.3 Description of the name plate

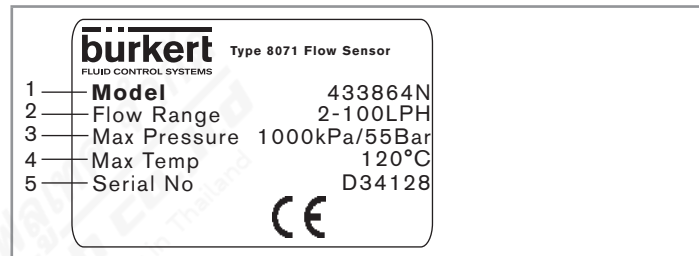


Fig. 2 Name plate of the device

1. Order code of the device
2. Flow rate measuring range
3. Max. pressure
4. Max. temperature
5. Serial number

5.4 Available versions

Process connection	Flow rate range		Materials			Max. pressure ¹⁾	Order code
	Viscosity > 5 mPa.s and < 1000 mPa.s	Viscosity < 5 mPa.s	Housing	Rotors / axis	Seal		
G 1/8"	0.5 ... 100 l/h	2 ... 100 l/h	Aluminium	Stainless steel	FKM	5 bar	565117
			Stainless steel	Stainless steel	FFKM	55 bar	565118
NPT 1/8"	0.5 ... 100 l/h	2 ... 100 l/h	Aluminium	Stainless steel	FKM	5 bar	565119
			Stainless steel	Stainless steel	FFKM	55 bar	565120

Process connection	Flow rate range		Materials			Max. pressure ¹⁾	Order code
	Viscosity > 5 mPa.s and < 1000 mPa.s	Viscosity < 5 mPa.s	Housing	Rotors / axis	Seal		
G 1/4"	0.5 ... 100 l/h	2 ... 100 l/h	PPS	PPS / Hastalloy C	FFKM	5 bar	432288
			Stainless steel	Stainless steel	FFKM	55 bar	433864
	15 ... 500 l/h	40 ... 500 l/h	PPS	PPS / Hastalloy C	FFKM	5 bar	430856
			Stainless steel	Stainless steel	FFKM	55 bar	437518
NPT 1/4"	0.5 ... 100 l/h	2 ... 100 l/h	PPS	PPS / Hastalloy C	FFKM	5 bar	448654
			Stainless steel	Stainless steel	FFKM	55 bar	448656
	15 ... 500 l/h	40 ... 500 l/h	PPS	PPS / Hastalloy C	FFKM	5 bar	448655
			Stainless steel	Stainless steel	FFKM	55 bar	448657

Process connection	Flow rate range	Materials			Max. pressure ¹⁾	Order code ²⁾
	Viscosity > 1000 mPa.s	Housing	Rotors / axis	Seal		
G 1/4"	15 ... 500 l/h	Stainless steel	Stainless steel	FFKM	55 bar	552426
NPT 1/4"	15 ... 500 l/h	Stainless steel	Stainless steel	FFKM	55 bar	553652

1) High pressure versions available on request

2) Other high viscosity versions available on request



6 TECHNICAL DATA

6.1 Conditions of use

Ambient temperature	<ul style="list-style-type: none"> Aluminium or PPS housing Stainless steel housing 	<ul style="list-style-type: none"> max. 80 °C max. 120 °C
Air humidity	< 85%, non condensated	
Protection rating	IP54 (NEMA 13)	

6.2 Standard and directives

The device complies with the relevant EU harmonisation legislation. In addition, the device also complies with the requirements of the laws of the United Kingdom.

The harmonised standards that have been applied for the conformity assessment procedure are listed in the current version of the EU Declaration of Conformity/UK Declaration of Conformity.

6.2.1 Conformity to the Pressure Equipment Directive

- Make sure that the device materials are compatible with the fluid.
- Make sure that the pipe DN is adapted for the device.
- Observe the fluid nominal pressure (PN) for the device. The nominal pressure (PN) is given by the device manufacturer.

The device conforms to Article 4, Paragraph 1 of the Pressure Equipment Directive 2014/68/EU under the following conditions:

- Device used on a pipe (PS = maximum admissible pressure, in bar; DN = nominal dimension of the pipe, in mm)

Type of fluid	Conditions
Fluid group 1, Article 4, Paragraph 1.c.i	DN ≤ 25
Fluid group 2, Article 4, Paragraph 1.c.i	DN ≤ 32 or PSxDN ≤ 1000
Fluid group 1, Article 4, Paragraph 1.c.ii	DN ≤ 25 or PSxDN ≤ 2000
Fluid group 2, Article 4, Paragraph 1.c.ii	DN ≤ 200 or PS ≤ 10 or PSxDN ≤ 5000

6.3 Mechanical data

Part	Material
Housing	<ul style="list-style-type: none"> Aluminium PPS Stainless steel 316F (1.4401)
Rotors	<ul style="list-style-type: none"> PPS Stainless steel 316F (1.4401)
Axis	<ul style="list-style-type: none"> Hastalloy C Stainless steel 316F (1.4401)
Seal	FKM or FFKM

6.4 Fluid data

Process connection	Internal thread G 1/8", G 1/4", NPT 1/8" or NPT 1/4"
Max. fluid pressure	<ul style="list-style-type: none"> PPS or aluminium housing • 5 bar Stainless steel housing • 55 bar (550 bar on request)
Viscosity	Depends on the version (see chap. 5.4)
Flow rate measuring range	Depends on the version (see chap. 5.4)
Accuracy	≤ ±1% of the measured value
Repeatability	≤ ±0,03% of the measured value
Max. size of particles	75 µm

6.5 Electrical data

Supply voltage	4,5 ... 24 V DC
Tansistor output	<ul style="list-style-type: none"> • Type of output • Frequency on open collector, NPN, max. 25 mA, 4,5 to 24 V DC • Hall sensor max. intensity • Recommended load
Reed switch output	<ul style="list-style-type: none"> • Type • Max. switching voltage • Max. switching current • Max. operating current • Number of cycles (typical)
Electrical connection	5-wire cable, 1 m long

6.6 Dimensions

→ Please refer to the technical data sheets regarding the type 8071, available at: country.burkert.com

6.7 K factors (in pulse/l)

Flow rate range	K factor (in pulse/l)
0.5 ... 100 l/h	1000
15 ... 500 l/h	400



If the device is combined with an instrument which does not automatically convert the K factors, make the conversion using one of the following formulae:

K factor in pulse/gallon US = K factor in pulse/l x 3,785
to obtain flow rate in gallon US / time unit

K factor in pulse/gallon UK = K factor in pulse/l x 4,546
to obtain flow rate in gallon UK / time unit.

7 INSTALLATION AND WIRING

7.1 Safety instructions



DANGER

Risk of injury due to high pressure in the installation.

- ▶ Stop the circulation of fluid, cut off the pressure and drain the pipe before loosening the process connections.

Risk of injury due to electrical voltage.

- ▶ Shut down and isolate the electrical power source before carrying out work on the system.
- ▶ Observe all applicable accident protection and safety regulations for electrical equipment.

Risk of injury due to the nature of the fluid.

- ▶ Respect the prevailing regulations on accident prevention and safety relating to the use of aggressive fluids.

Risk of injury due to high fluid temperatures.

- ▶ Use safety gloves to handle the device.
- ▶ Stop the circulation of fluid and drain the pipe before loosening the process connections.
- ▶ Keep all easily flammable material and fluid away from the device.



WARNING

Risk of injury due to non-conforming installation.

- ▶ The electrical and fluid installation can only be carried out by qualified and skilled staff with the appropriate tools.
- ▶ Install the appropriate security devices (correctly dimensioned fuse and/or circuit breaker).

Risk of injury due to unintentional switch on of power supply or uncontrolled restarting of the installation.

- ▶ Take appropriate measures to avoid unintentional activation of the installation.
- ▶ Guarantee a set or controlled restarting of the process subsequent to the installation of the device.

7.2 Installation instructions

NOTE

Risk of damaging the device if it is subjected to mechanical stress.

- ▶ Use flexible hoses.

NOTE

The oval rotors may be damaged if particles with diameter > 75 µm go into the fitting.

- ▶ Install a strainer of 75 µm upstream and as close as possible to the device.

→ Install a by-pass line on your installation to service the device and the strainer without stopping the process (see Fig. 3).

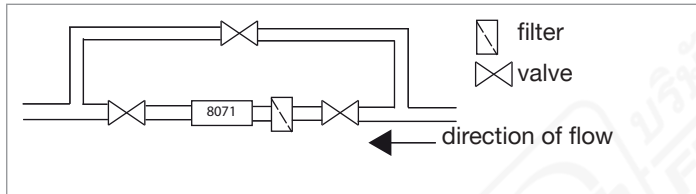


Fig. 3 Installation of a by-pass line

→ Install the device onto the pipe so that the shafts of the rotors are in a horizontal plane.

- ! Seal the external threads of the fitting with a product compatible with the materials from which the device housing and the pipe are made.

→ Screw the device onto the pipe.

7.3 Wiring



DANGER

Risk of injury due to electrical voltage.

- ▶ Shut down and isolate the electrical power source before carrying out work on the system.
- ▶ Observe all applicable accident protection and safety regulations for electrical equipment.



- Use a high quality electrical power supply (filtered and regulated).
- Make sure the installation is equipotential.

Red wire	Power supply (+)
Black wire	Power supply (-)
White wire	NPN transistor output
Yellow wire	Reed switch
Green wire	Reed switch

Table 1: Connection wire assignment

7.3.1 Wiring the NPN transistor output and the Reed switch output

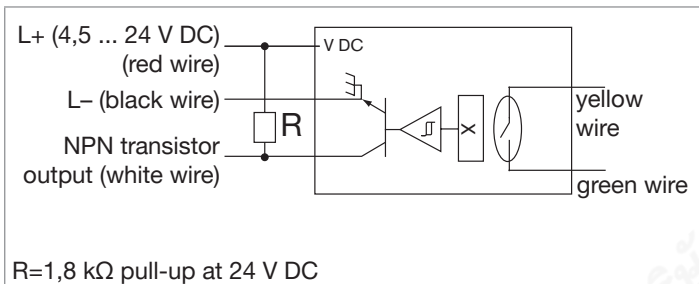


Fig. 4 Wiring of NPN transistor output and the Reed switch output

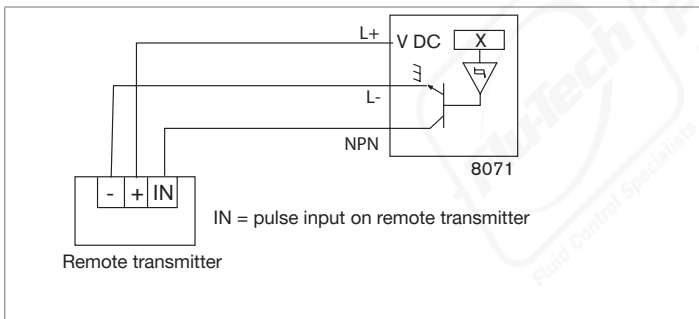


Fig. 5 Example for the connection of the NPN transistor output to a remote transmitter

8 COMMISSIONING

8.1 Safety instructions



WARNING

Risk of injury due to nonconforming commissioning.

Non conforming commissioning may lead to injuries and damage the device and its surroundings.

- ▶ Before commissioning, make sure that the staff in charge have read and fully understood the contents of the manual.
- ▶ In particular, observe the safety recommendations and intended use.
- ▶ The device / the installation must only be commissioned by suitably trained staff.



Protect this device against electromagnetic interference, ultraviolet rays and, when installed outdoors, the effects of the climatic conditions.



The pipe must be full of liquid without air bubbles.

→ Drain air from the pipe by gradually filling the pipe with fluid.

→ Make sure the installation is tight.

9 MAINTENANCE AND TROUBLESHOOTING

9.1 Safety instructions



DANGER

Risk of injury due to high pressure in the installation.

- ▶ Stop the circulation of fluid, cut off the pressure and drain the pipe before loosening the process connections.

Risk of injury due to electrical voltage.

- ▶ Shut down and isolate the electrical power source before carrying out work on the system.
- ▶ Observe all applicable accident protection and safety regulations for electrical equipment.

Risk of injury due to the nature of the fluid.

- ▶ Respect the prevailing regulations on accident prevention and safety relating to the use of aggressive fluids.

Risk of injury due to high fluid temperatures.

- ▶ Use safety gloves to handle the device.
- ▶ Stop the circulation of fluid and drain the pipe before loosening the process connections.
- ▶ Keep all easily flammable material and fluid away from the device.



WARNING

Risk of injury due to non-conforming maintenance.

- ▶ Maintenance must only be carried out by qualified and skilled staff with the appropriate tools.
- ▶ Guarantee a set or controlled restarting of the process, after a power supply interruption.

9.2 Maintenance of the strainer

- After the circulation of 200 liters of fluid, examine the strainer for particles. If necessary clean the strainer with a product compatible with the materials from which it is made.
- Regularly examine the strainer for good condition, in particular when the flow rate decreases. If necessary clean the strainer with a product compatible with the materials from which it is made.

9.3 Maintenance of the device

- Regularly examine the seal and the oval rotors for good condition. Follow the instructions on chap. [9.4](#) et [9.5](#).

Clean the device with a cloth slightly dampened with water or a cleaning liquid compatible with the materials the device is made of.

Your Bürkert supplier is at your disposal for any further information.

9.4 Dismantle the device

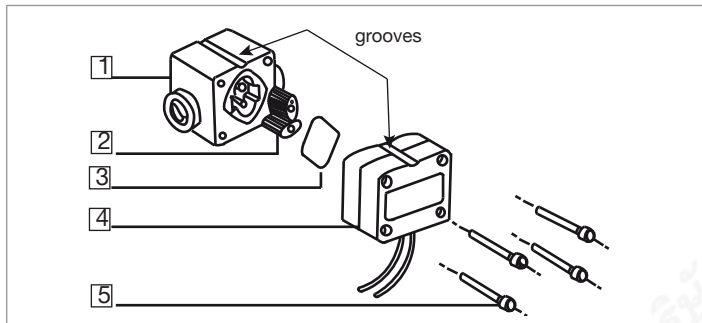


Fig. 6 Exploded view of the device

- Unscrew the 4 screws (mark 5 Fig. 6) and remove the cover including the electronic module (mark 4 Fig. 6).
- Remove the seal (mark 3 Fig. 6).
- Examine the seal for good condition. If not, replace it by a new one (see chap. "10 Spare parts and accessories").
- Remove the rotors (mark 2 Fig. 6).
- Examine the rotors for good condition. If necessary, clean or replace them (see chap. 10).

9.5 Assemble the device



Put the magnetized rotor on the same side as the groove (see Fig. 7 and table below).

→ Put the rotors inside the housing, at 90° (see Fig. 7).

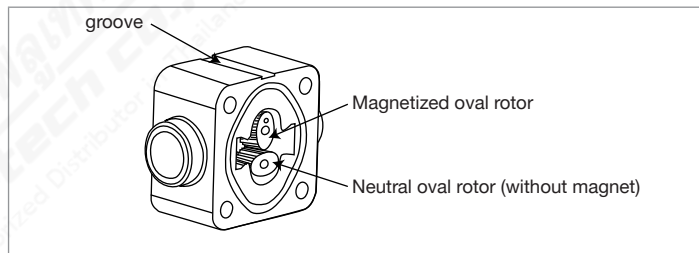


Fig. 7 Position of the oval rotors

Flow rate range	Magnetized oval rotor
0.5 ... 50 l/h	hole of the magnet seat is visible (set towards the cover)
<ul style="list-style-type: none"> • 0.5 ... 50 l/h • 2 ... 100 l/h • 15 ... 500 l/h 	hole of the magnet seat is not visible (set towards the bottom of the housing)

- Set the radius of curvature present on the periphery of the oval rotors towards the bottom of the rotor housing (see [Fig. 8](#)).

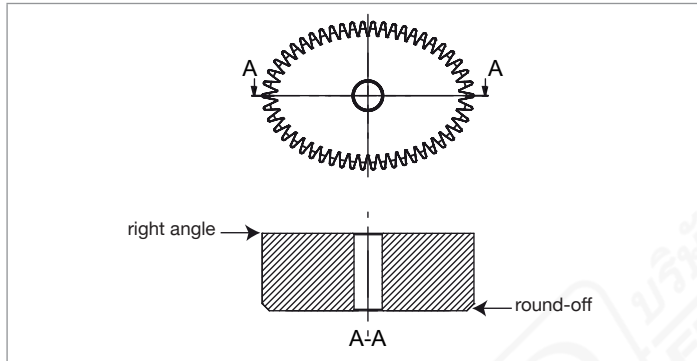


Fig. 8 Cross-section of an oval rotor

- Tighten the 4 screws (mark 5 [Fig. 6](#)), carefully to avoid damages to the housing, and in an alternating pattern at the following torque:
 - 1 Nm for a PPS housing
 - 2 Nm for an aluminium housing
 - 9 Nm for a stainless steel housing
- Make sure that the magnet is in place by using a detector.
- Make sure that the rotors freely turn by turning them slowly with the finger.
- Put the seal (mark 3 [Fig. 6](#)) in its groove.
- Put the cover (mark 4 [Fig. 6](#)) on the housing, aligning the groove on the cover with the one of the housing.

9.6 If a problem occurs

Problem	Cause	Solution
Fluid does not flow through the device any more	Obturated device	→ Remove and clean the oval rotors (see chap. "9.4 Dismantle the device" and chap. "9.5 Assemble the device"). → Add a strainer of 75 µm upstream of the device.
	Obturated strainer (if present)	→ Clean the strainer.
	Rotors damaged	→ Replace the rotors (see chap. "10 Spare parts and accessories" , "9.4 Dismantle the device" and "9.5 Assemble the device").
Reduced flow rate through the device	Strainer (if present) partially obturated	→ Clean the strainer.
	Fluid too viscous	Use rotors for fluids with a viscosity > 1000 mPa.s.
Incoherent measurement	Flow rate range not adapted	→ Verify specifications, adjust the device or the flow rate (see chap. "6.5 Fluid data [Titel level 2]").
	Air within the pipe	→ Slowly drain air from the pipe.
	Friction due to an incorrect assembly of the device	→ Verify the assembly of the rotors in the fitting (see chap. "9.4 Dismantle the device" and chap. "9.5 Assemble the device").
No frequency output	Incorrect wiring of the outputs	→ Make sure that the device has been wired correctly (see chap. "7.3 Wiring").
	Rotors incorrectly mounted	→ Dismantle the device and modify the position of the rotors (see chap. "9.4 Dismantle the device" and chap. "9.5 Assemble the device").
	Magnet damaged	→ Replace the rotors (see chap. "10 Spare parts and accessories" , "9.4 Dismantle the device" and "9.5 Assemble the device").
	Hall sensor or Reed switch defective	→ Replace the cover with electronic module (see chap. "10 Spare parts and accessories" , 9.4 and 9.5).

10 SPARE PARTS AND ACCESSORIES



CAUTION

Risk of injury and damage caused by the use of unsuitable parts.

Incorrect accessories and unsuitable spare parts may cause injuries and damage the device and the surrounding area.

- ▶ Use only original accessories and original spare parts from Bürkert.

Spare part	Order code
Set of 2 oval rotors in stainless steel, flow rate range of 0.5 ... 100 l/h	550919
Set of 2 oval rotors in stainless steel, flow rate range of 15 ... 500 l/h	550920
Set of 2 oval rotors in PPS, flow rate range of 0.5 ... 100 l/h	550921
Set of 2 oval rotors in PPS, flow rate range of 15 ... 500 l/h	550922
FKM seal	550923
FFKM seal	550959
Cover in stainless steel with electronic module including Hall effect sensor and Reed switch	553653

Spare part	Order code
Cover in PPS with electronic module including Hall effect sensor and Reed switch	553654
Cover in aluminium with electronic module including Hall effect sensor and Reed switch	on request

11 PACKAGING, TRANSPORT

NOTE

Damage due to transport

Transport may damage an insufficiently protected device.

- ▶ Transport the device in shock-resistant packaging and away from humidity and dirt.
- ▶ Do not expose the device to temperatures that may exceed the admissible storage temperature range.
- ▶ Protect the electrical interfaces using protective plugs.

12 STORAGE

NOTE

Poor storage can damage the device.

- ▶ Store the device in a dry place away from dust.
- ▶ Storage temperature: -10...+60 °C.

13 DISPOSAL OF THE DEVICE

→ Dispose of the device and its packaging in an environmentally-friendly way.

NOTE

Damage to the environment caused by products contaminated by fluids.

- ▶ Keep to the existing provisions on the subject of waste disposal and environmental protection.

Environmentally friendly disposal



- ▶ Follow national regulations regarding disposal and the environment.
- ▶ Collect electrical and electronic devices separately and dispose of them as special waste.

Further information country.burkert.com.

bürkert
FLUID CONTROL SYSTEMS



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