Operating Instructions

for

Bypass Magnetic Switch

Model: NBK-RPVC

We don’t accept warranty and liability claims neither upon this publication nor in case of improper treatment of the described products.

The document may contain technical inaccuracies and typographical errors. The content will be revised on a regular basis. These changes will be implemented in later versions. The described products can be improved and changed at any time without prior notice.

1. Contents

Manufactured and sold by:

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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.

When used in machines, the measuring unit should be used only when the machines fulfil the EC machinery directive.

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:

- Bypass Magnetic Switch model: NBK-RPVC

4. Regulation Use

Any use of the device, which exceeds the manufacturer's specification, may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

5. Operating Principle

Bypass magnetic switches are non-contact switches. They are mainly made of a switch housing with a built-in reed contact, proximity switch or rotational switch. They are triggered by the magnetic field of a permanent magnet.
The Bypass magnetic switches are used to provide a switching function at a predetermined level in connection with Kobold bypass level indicators of type NBK-16 or comparable products. For this, one or several switches can be mounted on the level indicator

Note:
Magnetic Switches and bypass level indicators with built-in float are designed for each other and ensure reliable functioning and trouble-free operation.
When mounting on level indicators of other manufacturers, malfunctions can occur due to a different arrangement of the magnetic fields.

6. Safety

6.1 Proper intended use

The Bypass magnetic switches are solely intended for monitoring the liquid level of fluids. The area of use is based on the technical performance limits and materials.

- The fluids must not be contaminated nor contain coarse particles nor tend to crystallize. It must be ensured that the magnetic switch materials that come into contact with the media are sufficiently resistant to the monitored medium. Not suitable for dispersion, abrasive fluids, highly viscous media and paints.
- Compliance with the usage conditions specified in the operating instructions is required.
- Do not operate the unit in direct proximity of ferro-magnetic environments (distance min. 50mm).
- Do not operate the unit in direct proximity of strong electromagnetic fields or in direct proximity of facilities that can be impacted by magnetic fields (distance min. 1m).
- The magnetic switches may not be subjected to strong mechanical stresses (impact, bending, vibrations). The unit is exclusively de-signed and constructed for the intended use described here and may only be used accordingly.
- The switching points of the magnetic switch cannot be adjusted.
- These instructions are intended for technicians who execute the installation and calibration.
- Compliance with the relevant safety regulations for the use is re-quired.
- Compliance with the technical specifications in these operating instructions is required. Improper use or operation of the unit outside the technical specifications requires immediate shut-down and inspection by an authorized Kobold service technician.

6.2 Improper use

Any use that exceeds the technical performance thresholds or that is in-compatible with the materials is considered improper use.

WARNING!
Injury due to improper use
Improper use of the unit can result in hazardous situations and injuries.

- **Do not modify the unit without authorization**
- **Do not use the unit in potentially explosive areas.**

Any use beyond the proper intended use or any other use is considered improper use.
Do not use this unit in safety or emergency off equipment.

6.3 Responsibility of the operator

The unit is used in the industrial sector. The operator is therefore subject to statutory obligations with respect to occupational safety.

In order to safely work on the unit, the operator must ensure

- the operating personnel is regularly trained in all matters pertaining to occupational safety, first aid and environmental conservation and is familiar with the operating instructions and, in particular, the safety instructions contained therein
- the unit is suitable for the application in accordance with the proper intended use (check for improper use).

After check, improper use is excluded.

6.4 Personnel qualification

WARNING!
Risk of injury due to insufficient qualifications
Improper use can result in significant personal injury and property damages.

- **The activities described in these operating instructions may only be performed by specialist technicians with the following qualifications.**

Specialist personnel
The specialist personnel authorized by the operator is capable of executing the described work and autonomously detect potential hazards due their technical training, knowledge of measuring and control technology and their experience and knowledge of country-specific regulations, applicable standards and guidelines.

6.5 Personal safety equipment

The personal safety equipment serves to protect the technicians against hazards that might impact the safety or health while working. When executing the various tasks on and with the unit, the technicians must wear personal safety equipment.

Comply with warning signs posted in the work area regarding personal safety equipment!

The required personal safety equipment must be provided by the operator.

7. Commissioning, operation

Comply with all of the instructions on the packaging pertaining to removing the transport locks.
Remove the magnetic switch from the packaging carefully!
When unpacking, check all parts for external damage.
Functional test before assembly:

The functional test is carried out to determine the proper functioning of the switching contacts. You should disconnect the power connection between the control and the switch before the test. You can determine the switching condition e.g. with a continuity tester. You can carry out the functional test by actuating the contact with a permanent magnet with a radial magnetic field in the switching area. For this, you should move the magnet alongside the Magnetic Switch from the bottom towards the top. When doing so, the contact should switch over. Afterwards, you should move the magnet again from the top towards the bottom. The contact is falling back into its initial position. Instead of the magnet, you can also use the built-in float of the bypass level indicator.

During the functional test, unintentional processes can be triggered off in the downstream control. Risk of physical injuries and property damage. Competent technical staff only should connect and disconnect power lines. Do not operate Magnetic Switches in the immediate proximity of powerful electromagnetic fields (distance should be at least 1m).
Do not expose Magnetic Switches to strong mechanical loads.

7.1 Mounting preparations

Ensure the sealing surface of the container or the NBK-RPVC is clean and has no mechanical damage.

7.2 Mounting

Before mounting in an aggressive environment, you should ensure that the Magnetic Switch's case is resistant to it accordingly. When choosing the place for mounting, you should take into account the system of protection of the used switch. Magnetic Switches, which have been supplied together with Kobold bypass level indicators, are preassembled already and should just be adjusted to the desired switching height only.

Mounting occurs on magnetic roller indicator (model BMD) on bypass level indicator (model BNA) or directly with tightening straps.

Type	Description (Switch, housing)	Attachment with T-slot	Attachment with tightening straps
NBK-RPVC	Reed, aluminium case, cable outlet	X	X

7.3 Mounting the Magnetic Switch on magnetic indicator

The Magnetic Switches will be mounted on the magnetic roller level indicator of the bypass level indicator by means of t-slot stones.

1. Insert the t-slot block(s) into the slot of the magnetic roller indicator from top or bottom. Unscrew the fastening screws at the Magnetic Switch with a hexagon socket screw key WAF 3 mm by about one turn.
2. Insert the t-slot block(s) into the slot of the magnetic roller indicator from top or bottom.
3. Shift the Magnetic Switch to the level of the desired switching point and fasten it by tightening the screws (the switching point is marked).

The Magnetic Switches can be mounted on both sides of the magnetic roller level indicators optionally. For this, you should mount the t-slot block on the switch's opposite side. The assembly at works is done on the by-pass level indicator's right side.
When mounting several Magnetic Switches on the bypass level indicator, we recommend mounting them on both sides of the magnetic roller indicator alternately. Thus, it is ensured that any desired switching height can be adjusted.

7.3.1 Mounting of Magnetic Switch with tightening straps

1. Open the fixing band by loosening the adjustment screw.
2. Slide the fixing band through the opening on the magnetic switch
3. Attach the fixing band to the bypass chamber and tighten via adjustment screw, so that the magnetic switch can still be moved.
4. Slide the magnetic switch to the desired switching height and fix into position by tightening the screw. (The switch point is marked).

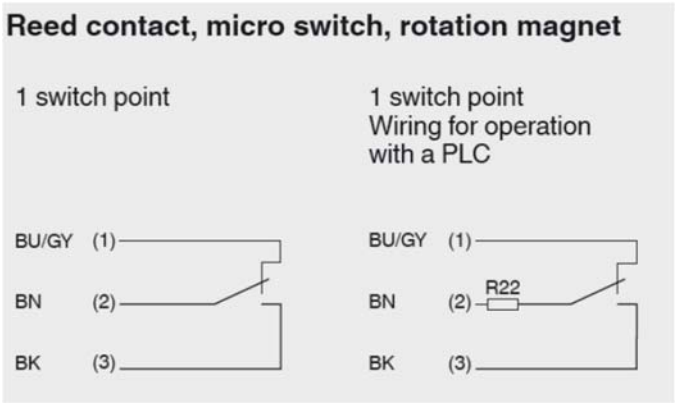
Note!

1. **When mounting, please pay attention to that the cable entry faces downwards. In order to ensure a safe switching function, the Magnetic Switch's case should sit close to the bypass pipe.**
2. **The Magnetic Switches do only work in the area between the by-pass level indicator's process connections. We cannot guarantee a safe functioning if a switching point is set outside that area.**

8. Electrical connection

The electrical connection must be established in accordance with the application construction regulations in the country of installation and may only be performed by specialist personnel.

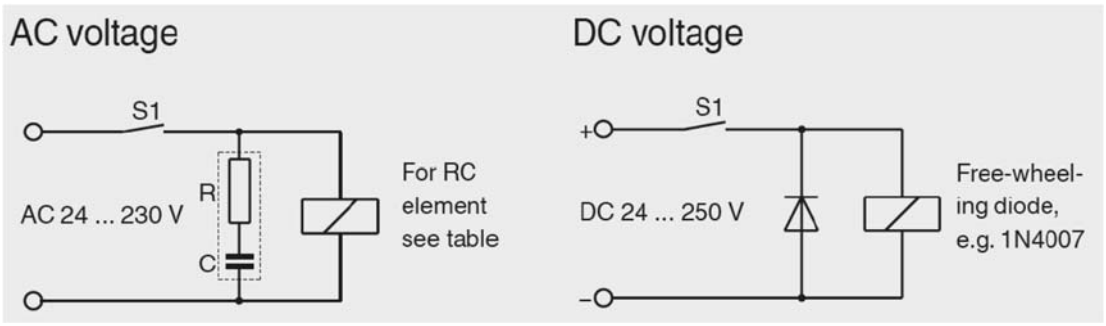
The connection should be carried out pursuant to the connection diagram with at least 3 x 0,75mm² according to the desired switching function. When selecting the cable, please pay attention to that it is suitable for the planned area of application (temperature, weather influences, aggressive atmosphere etc.).



Protection Class II

Warning!
The operation of the Magnetic Switches at inductive or capacitive load can result in the destruction of the reed contact. This can lead to a malfunction of the downstream control and to physical injury or property damage.

With inductive load, please protect the Magnetic Switches by wiring with a RC module (see appendix) or with a shunt diode. The use of varistors protective wiring is not permitted for the reed contact can be destroyed by occur-ring peaks. With capacitive load, line lengths above 50m, or connection to process control systems with capacitive input a protective resistor of 22 Ω should be connected in series to the to limit the peak current.



RC modules for switch protection
Depending on the operating voltage, RC modules should only be used in accordance with the table below.
Other RC modules that those listed here will result in the destruction of the Reed switch.

For reed contacts from 10 - 40 VA

Voltage	Resistance	Capacity
AC 24 V	100 Ω	0,33 µF
AC 48 V	220 Ω	0,33 µF
AC 115 V	470 Ω	0,33 µF
AC 230 V	1500 Ω	0,33 µF

For reed contacts from 40 - 100 VA

Voltage	Resistance	Capacity
AC 24 V	47 Ω	0,33 µF
AC 48 V	100 Ω	0,33 µF
AC 115 V	470 Ω	0,33 µF
AC 230 V	1000 Ω	0,33 µF

8.1 Commissioning

You should set the Magnetic Switches to their defined initial state before putting them into operation. For this, you should push the bypass level indicator's float inside the pipe slowly from the bottom towards the top and afterwards to the bottom again. If this is not possible anymore, you may even pass the float alongside the Magnetic Switch from the bottom to-wards the top and afterwards to the bottom again. Pay attention to the identification „top“ at the float.
When retrofitting Magnetic Switches, you should set these to their defined initial state in the same way. If a float is not available, you may even use a permanent magnet of any radial polarity for this procedure.
Due to the bistable switching behaviour of the Magnetic Switches, a de-fined initial state before putting them into service is mandatory. Otherwise, there is a risk that a defective switching function is triggered off in the downstream control through a false contact position upon initial start-up.

Adjustment of the Magnetic Switch
Unscrew the fastening screw(s) and shift the Magnetic Switch to the level of the desired switching point.
Tighten the fastening screw again afterwards.

9. Faults

The most frequent root causes and required countermeasures are listed in the following table.

Fault	Cause	Measure
Bypass magnetic switch cannot be mounted at the in-tended position on the Bypass	Collision with other attachments	Modification of the attachments or return shipment to the factory
No or undefined switching function	Electrical connection incorrect	See chapter 8
	Reed contact defective	Return shipment to factory
	Incorrect switching function	Change terminal assignment
	Switching position in-correct	New positioning of the NBK-RPVC
	Ragged cable	Return shipment to factory
	Switch are not triggered by the float mag-net	

CAUTION!
Bodily injuries, property and environmental damages If faults cannot be rectified with the help of the listed measures, immediately shut the unit off.

- **Ensure the pressure is switched off and secure the unit against unintentionally being switched on.**
- **Contact the manufacturer.**

10. Maintenance and cleaning

10.1 Maintenance

Bypass magnetic switches Type NBK-RPVC do not require maintenance if operated properly.

The switches should be repaired by the manufacturer or by persons authorized by the manufacturer only. You should observe the international and national regulations regarding the implementation of the repair. Please use Kobold spare parts only, for otherwise the conformity with the approval of the type of protection cannot be guaranteed.

DANGER!
When working on containers, there is a risk of poisoning or suffocation. Work may only be performed using suitable personal safety equipment (e.g. respiratory protection, protective clothing, etc.).

NOTICE!
Fault-free functionality of the magnetic switch can only be guaranteed if original Kobold accessories and spare parts are used.

10.2 Cleaning

CAUTION!
Bodily injuries, property and environmental damages Improper cleaning may result in bodily injuries, property and environmental damages. Measurement material residues in the disassembled unit can result in risks to persons, the environment and equipment.

- **Flush and clean the disassembled unit.**
- **Implement sufficient precautionary measures.**
- **Prior to cleaning the unit, properly disconnect it from the process and the power supply.**
- **Carefully clean the unit with a damp cloth.**
- **Do not let electrical connections come into contact with moisture!**

CAUTION!
Property damage
Improper cleaning will damage the unit!

- **Do not use any aggressive cleaning agents.**
- **Do not use any hard or sharp objects for cleaning.**

11. Disassembly

Only disassemble the measuring unit when it has been disconnected from the pressure and voltage!
If necessary, the container must be relaxed.

12. Technical Information

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

13. Order Codes

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

14. Dimensions

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

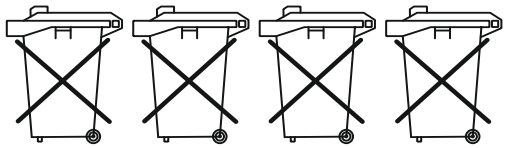
15. Disposal

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

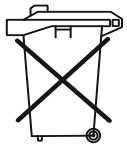
Batteries containing pollutants are marked with a sign consisting of a crossed-out garbage can and the chemical symbol (Cd, Hg, Li or Pb) of the heavy metal that is decisive for the classification as containing pollutants:



Cd[1] Hg[2] Pb[3] Li[4]

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

Electrical and electronic equipment



16. EU Declaration of Conformance

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

Bypass Magnetic Switch **Model: NBK-RPVC**

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

2014/35/EU **Low Voltage Directive**
2011/65/EU **RoHS** (category 9)

Also, the following standards are fulfilled:

EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements

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

Hofheim, 16 August 2023

H. Volz
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