Operating Instructions

for

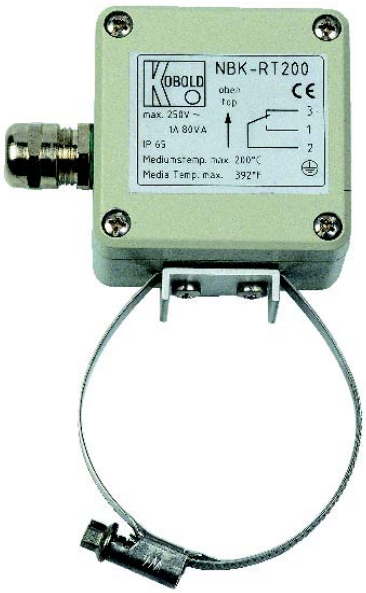
Limit switch

Model: NBK-R

NBK-RM

NBK-RT

NBK-RV/RN



1. Contents

Manufactured and sold by:

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Fax: +49(0)6192-23398
E-Mail: info.de@kobold.com
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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.

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-machine guidelines.

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:

- Electrical Limit Switches Model: NBK-R/NBK-RM/NBK-RT/NBK-RV/RN

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.

The Limit Switches for the NBK Bypass Level Indicators are used for continuos measuring, display and monitoring of liquids in tanks or vessels. Depending on the design they are suitable for applications with a higher operating temperature.

4.1 Electrical limit switch

- For standard applications NBK-R/NBK-RM: Bistable changeover contact fitted in a polycarbonate housing with 3 m connection cable

- For high temperature applications NBK-RT200/-RT400: Bistable changeover contact fitted in an aluminium die cast housing with terminal connectors.

NBK-RV/RN: Bistable changeover contact in aluminum housing with cable gland

5. Operating Principle

Kobold Bypass Limit Transmitter are used for the monitoring of limit values in tanks or vessels.
They are firmly attached with mounting plates and ribbon clamps to the Bypass Level Indicator, model NBK, and can be moved to any position on the bypass-tube within the measuring length.
The reed-contacts in the limit switches NBK-RV/RN react bistable and they are switched by the magnetic float inside the NBK tube as passing by.
One or more limit switches can be mounted on the bypass.

NBK-RN/RV
The switching behaviour is **bistable**. Should the electrical supply fail and return, the position of the impulse magnet will be "memorised". Because of its low mass switching element this level switch is particularly suitable in installations with strong vibrations. The level switch type NBK-RV200Nx has a Reed miniswitch for low level AC/DC loads.
Type NBK-RN200Nx also contains a resistor circuit conforming to two-wire sensors according to EN 60947-5 (NAMUR).

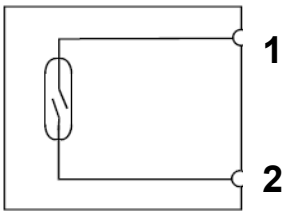


Fig.1: Schematic diagram NBK-RV200NO/NC

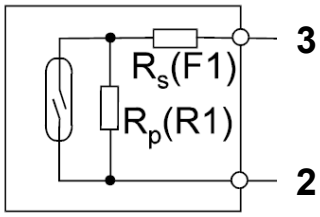
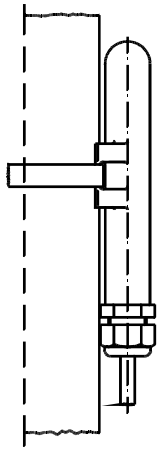


Fig.2: Schematic diagram NBK-RN200NO/NC

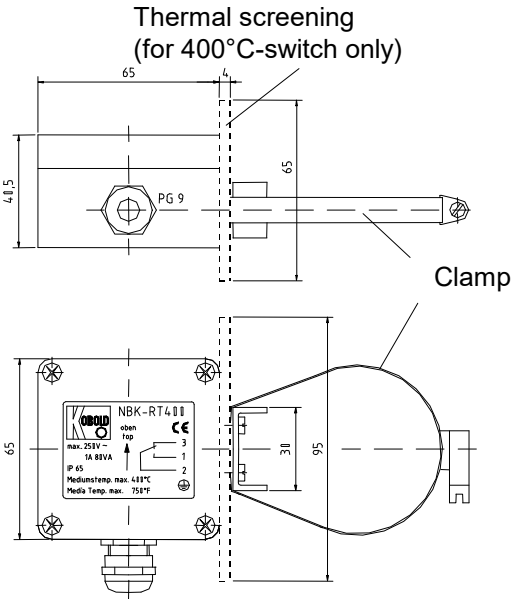
6. Mechanical Connection

NBK-R/NBK-RM



Mount and tighten the **reed switch** (NBK-R, NBK-RM) - if available - on the bypass tube at the opposite side of the roller indicator with the provided fastening clamps. The height of the switch contacts may be selected at will. The cable connection must point downwards. The switch must be attached close to the bypass tube. Due to technical adaptations, it may come to malfunctions, when installing new contacts in an existing plant. If the contact does not switch when the float passes by it, the preassembled spacer (plastic) must be removed.

NBK-RT200/400



The **high temperature switch** RT200/400 will be mounted to the bypass tube with the fastening clamp fixed at the contact housing.

NBK-RN/RV

The switch is installed using the enclosed fastening clamps. The cable gland must always point downwards. The switching point is about halfway up the housing. The heat protection shield is situated between the switch box and the mounting bracket.

The switches are factory-configured for the respective switching logic NO (make contact) or NC (break contact). However, the switching logic can be reconfigured on site by rotating the circuit board in the aluminum housing by 180° and at the same time rotating the aluminum housing itself by 180° on the pipe mounting bracket. After the conversion, the switch structure must always correspond to Fig. 3 or Fig. 4.

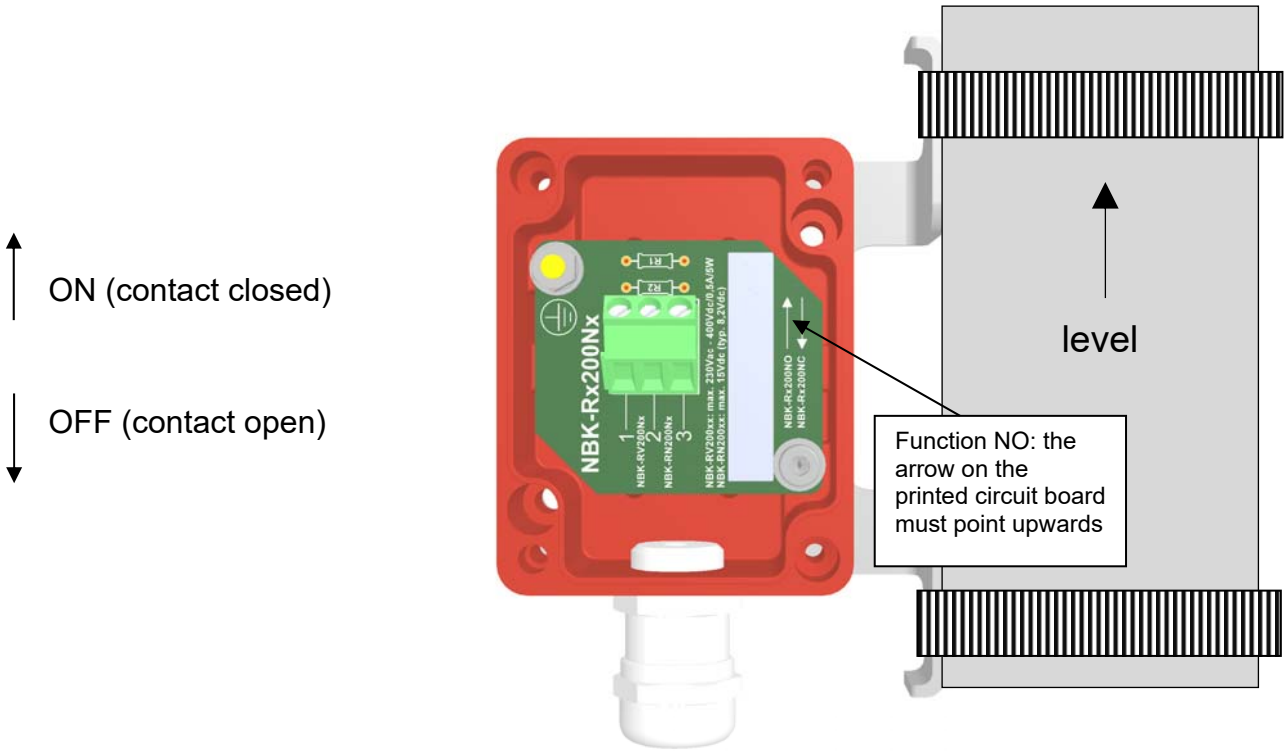


fig.3: Mounting NBK-RN200NC and NBK-RV200NC

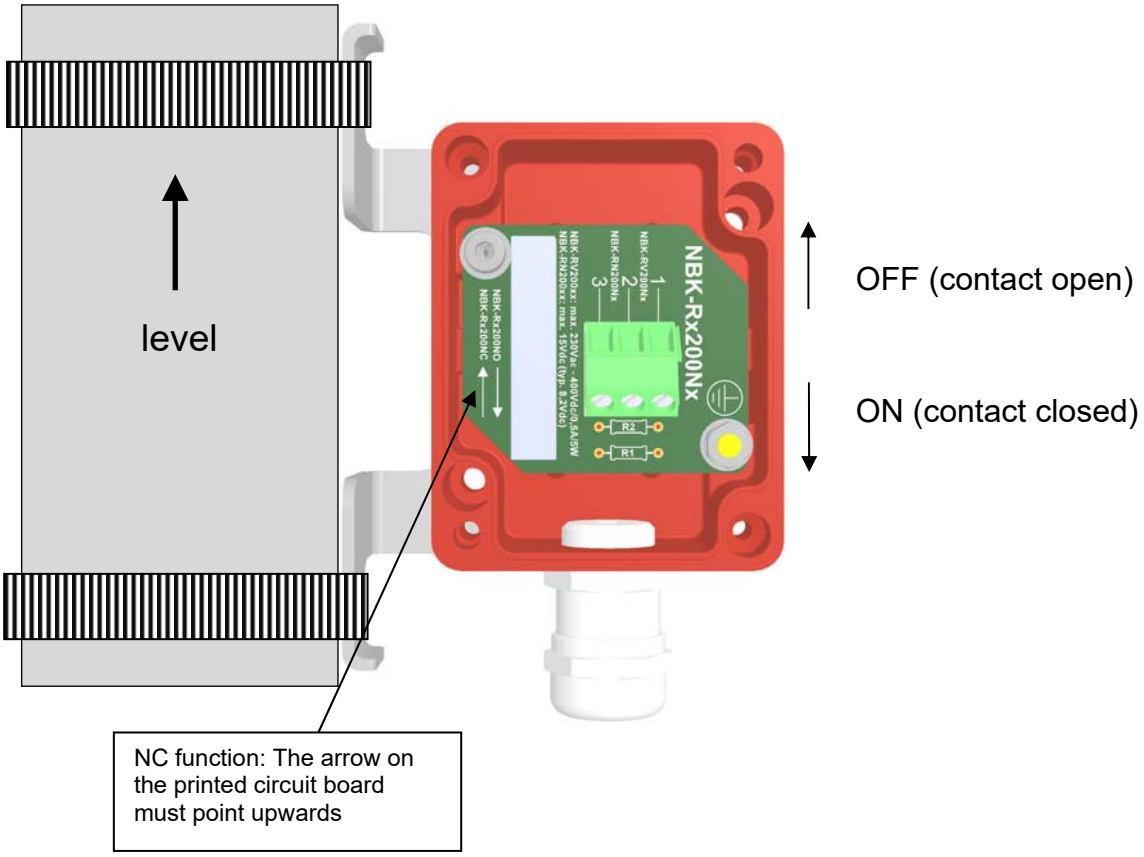


fig.4: Mounting NBK-RN200NO and NBK-RV200NO

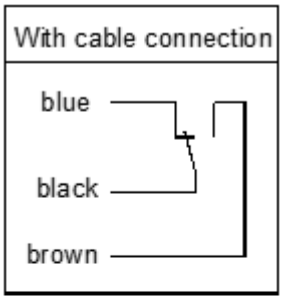
7. Electrical Connection

Limit switch NBK-R, NBK-RM, NBK-RT

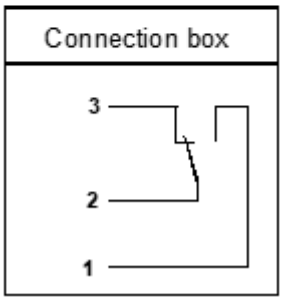
Attention!
Observe the allowed electrical ratings for the limit switch.

Maximum values	NBK-R NBK-RM Standard-contact	NBK-RT High temperature contact
Switching capacity:	60 W/VA	80 VA
Switching current:	1 A	1 A
Switching voltage:	230 $V_{AC/DC}$	250 $V_{AC/DC}$

NBK-R
NBK-RM



NBK-RT



Install the switch (if available) according to the diagram and connect it to the electrical controller.

When switching inductive loads, such as contactors, relays, etc., electrical limit values should not be exceeded, also temporarily by e.g. voltage peaks. The use of a contact protection relay is recommended to avoid overloading the reed contacts.
Valid regulations for hazardous areas, and regulations for installation (DIN/VDE 0165), should be observed when installing the NBK level indicator in zone 1 or 2 of hazardous areas (no combustible liquids).

NBK-RN/RV

The electrical wiring may only be carried out by trained specialists in compliance with the relevant safety regulations. With switching voltages greater than 75 V_{DC}/50 V_{AC} (NBK-RV200Nx), the PE connection in the aluminum housing must be firmly connected to the protective conductor. The usual protective measures must be taken for the reed contact.

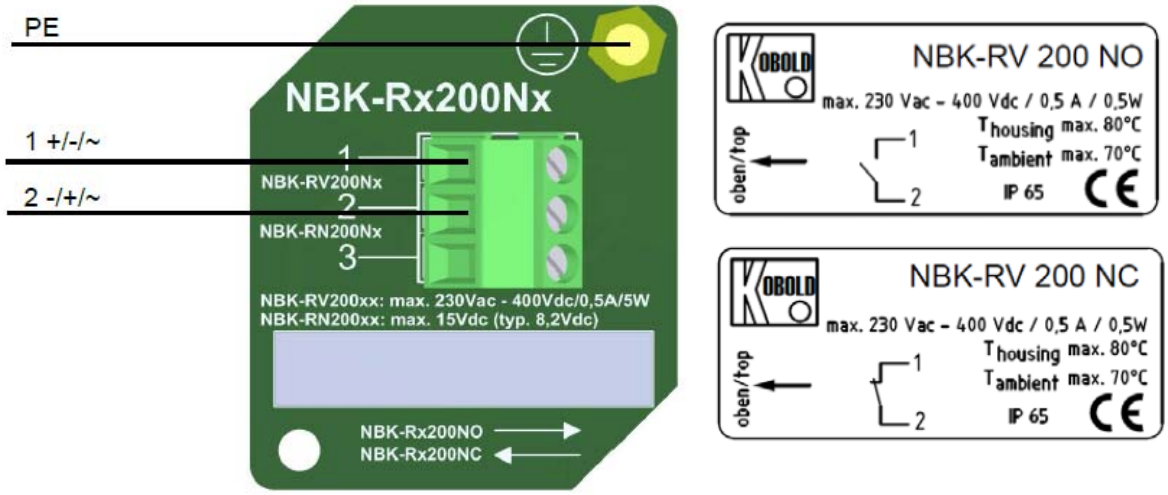


Fig. 5: Electrical connection NBK-RV200NO/NC

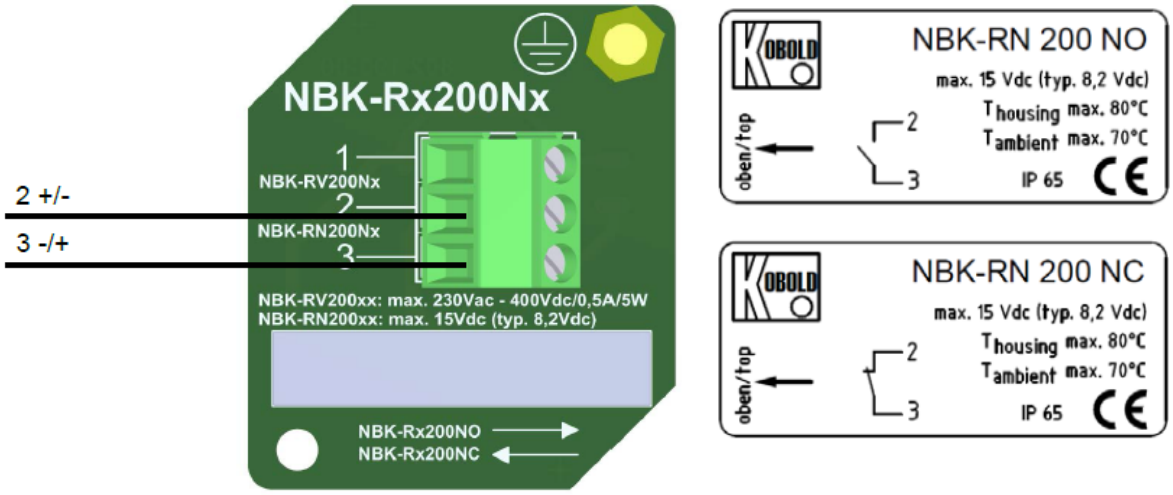


Fig. 6: Electrical connection NBK-RN200NO/NC

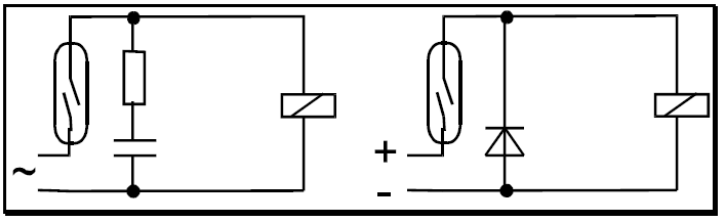


Fig. 7: Protective measures for DC and AC voltage

8. Commissioning NBK-R

Commissioning of the electrical reed switch

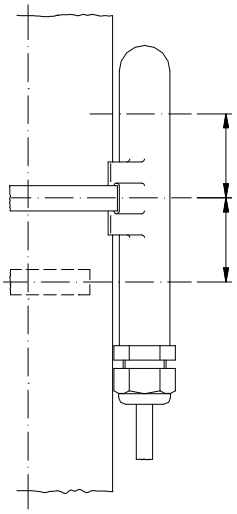
Function of switches

All switches have three connection poles (black (2), blue (3) and brown (1)).
The black wire (2) is the common pole for both switching functions (N/C and N/O contact).
The float must pass the switch once in both directions so that the switching function is in line with the terminal connection diagram and table below.
These instructions are often ignored when an alarm lamp is connected directly with the result that the alarm lamp incorrectly indicates a fault.
When the switch has been passed, it is ready for operation and requires no maintenance.

	black (2) / blue (1)	**black (2) / brown (3)**
float above	open	closed
float below	closed	open

Hysteresis

Hysteresis is the difference between contact closing and opening points. A hysteresis of approximately 15 mm float travel is achieved by factory tuning of the float magnet and contact strength.



9. Technical Information

Limit contact, model NBK-R/NBK-RM

Contact operation:	bistable changeover contact
Switching hysteresis:	approximately 15 mm
Max. switching capacity:	60 W/VA; 230 $V_{AC/DC}$; 1 A
Contact resistance:	100 mΩ
Medium temperature:	max. 100 °C
Ambient temperature:	max. 75 °C
Connection:	3 m PVC cable
Housing:	polycarbonate
Protection:	IP 67

Limit contact high temperature, model, NBK-RT200/-RT400

Contact operation:	bistable changeover contact
Switching hysteresis:	approximately 15 mm
Max. switching capacity:	80 VA; 250 V; 1 A
Contact resistance:	<20 mΩ
Medium temperature:	max. 200 °C (-RT200) / 400 °C (-RT 400)
Ambient temperature:	145 °C (RT200) / 350 °C (-RT400)
Connection:	terminal connectors, screwed cable gland
Housing:	aluminium die cast housing, terminal connectors
Protection:	IP 65

Limit contact NBK-RV/RN

Sensor type:	Reed contact, bistable
Switching characteristics:	NBK-Rx200NO: normally open NBK-Rx200NC: normally closed
Switching hysteresis:	approx. 7 mm
Max. medium temperature:	-104 °C ...+200 °C
Maximum case temperature:	+80 °C
Ambient temperature:	-40 to +70 °C

<u>NBK-RV200NO/NC:</u>

Max. operating voltage Umax:	400 VDC / 230 VAC
Max. load current Imax:	0.5 A
Max. switching capacity (resistive) Pmax:	5 W

NBK-RN200NO/NC:

Max. operating voltage Umax:	15 VDC
Pure:	approx. 1 kOhm
Out:	approx. 11 kOhm
Housing material:	aluminium, powder-coated
Mounting bracket:	stainless steel
Housing protection class:	IP65

It should be noted that none of the three parameters U_{max}, I_{max}, P_{max} may be exceeded!

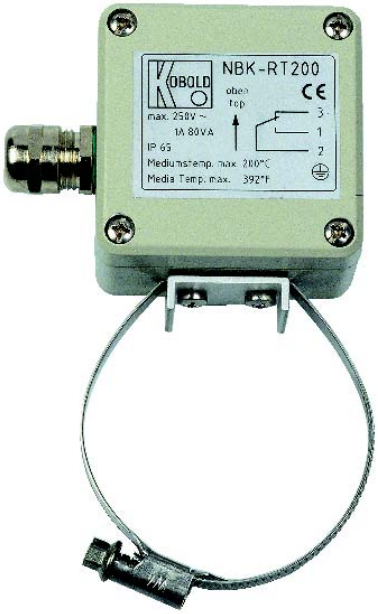
10. Order Codes

Order code	Contact type	Switch type
NBK-R **NBK-RM**	Standard limit contact, bistable	changeover contact
NBK-RT200	High temperature limit contact, t_{max} 200 °C, bistable	changeover contact
NBK-RT400	High temperature limit contact, t_{max} 400 °C, bistable	changeover contact
NBK-RV200NO	Reed contact, bistable	NO
NBK-RV200NC		NC
NBK-RN200NO	Reed contact bistable, NAMUR compliant	NO
NBK-RN200NC		NC

11. Illustrations

NBK-R/NBK-RM

NBK-RT



NBK-RV/RN

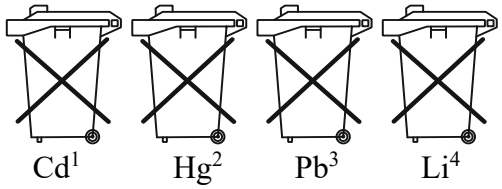
12. Disposal

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.

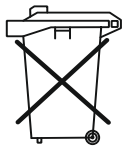
Batteries

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



13. EU Declaration of Conformance (NBK-R/NBK-RM/NBK-RT)

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

Limit Contact model: NBK-R / NBK-RM / NBK-RT

to which this declaration relates is in conformity with the standards noted below:

EN 61010-1:2010+A1:2019+A1:2019/AC:2019
Safety requirements for electrical measuring, control and laboratory instruments

EN 60529:2014
Protection type through case (IP code)

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

Also, the following EU directives are fulfilled:

2014/35/EU **Low Voltage Directive**
2011/65/EU **RoHS**
2015/863/EU Delegated Directive (RoHS III)

Hofheim, 02 Feb. 2023

H. Volz
General Manager

M. Wenzel
Proxy Holder

14. EU Declaration of Conformance (NBK-RV/RN)

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

Magnetic Contact model: NBK-RV200NO/NC and NBK-RN200NO/NC

to which this declaration relates is in conformity with the standards noted below:

EN 61010-1:2010+A1:2019+A1:2019/AC:2019
Safety requirements for electrical measuring, control and laboratory instruments

EN 60947-5-6:2000
Low-voltage switchgear and controlgear - Part 5-6: Control circuit devices and switching elements, DC interface for proximity sensors and switching amplifiers (NAMUR)

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

Also, the following EU directives are fulfilled:

2014/35/EU **Low Voltage Directive**
2011/65/EU **RoHS**
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