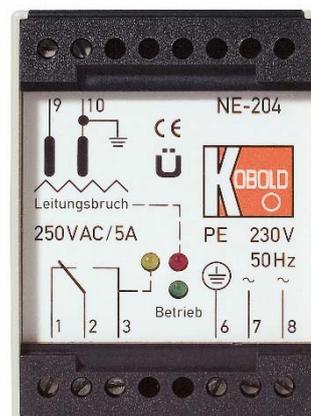


# Operating Instructions for Conductive Level Limit Switches

**Model: NEW, NE-204**



# NEW, NE-204

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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.

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## 2. Note

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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](http://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](mailto: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](http://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

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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:

- Conductive Level Limit Switches                      model: NEW, NE-204

## 4. Regulation Use

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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

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KOBOLD limit switches of model NEW are used for level monitoring and pump control of conductive liquids. The design without any moving parts also allows service with critical media with, for example, solid content, negligible density or high viscosity.

The instruments operate on the conductive principle. A low a. c. voltage is applied between the earth electrode and a switching point electrode. The a.c. voltage is electrically isolated from the mains for safety reasons. If the conductive medium touches the electrodes, a negligible alternating current flow across the electrodes and the conductive medium to the electrode relay. The relay amplifies the alternating current and operates a switching relay or a pump controller.

## 6. Application area

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The level sensors are suitable for use in containers with atmospheric operating conditions. The level sensors are not intended for use in pressure vessels.

## 7. Mechanical connection

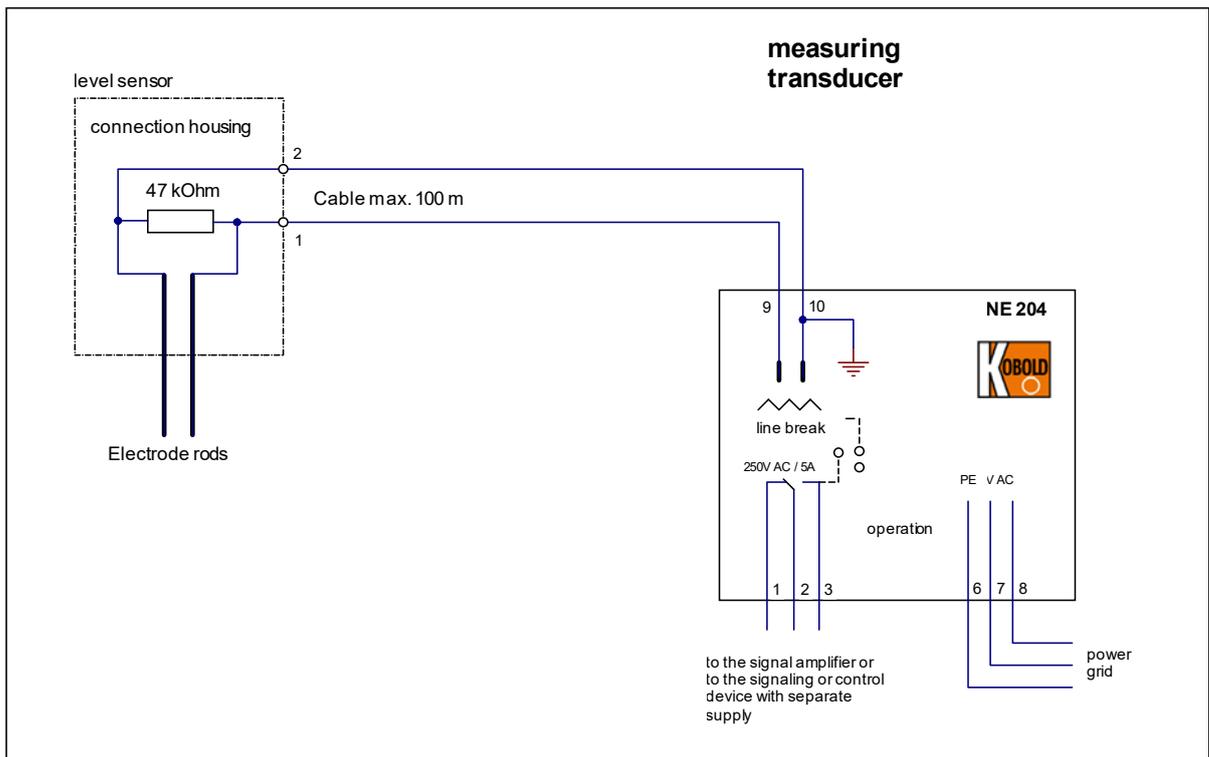
### 7.1 Installation of the level sensors

The level sensors are intended for vertical installation from above, but can also be installed at an angle of up to 45 degrees. However, the installation of a counter bearing is necessary if the electrode rods exceed a length of 1.5 m. The material of the counter bearing must consist of non-conductive material.

## 8. Electrical connection

### 8.1 Connecting the transmitter

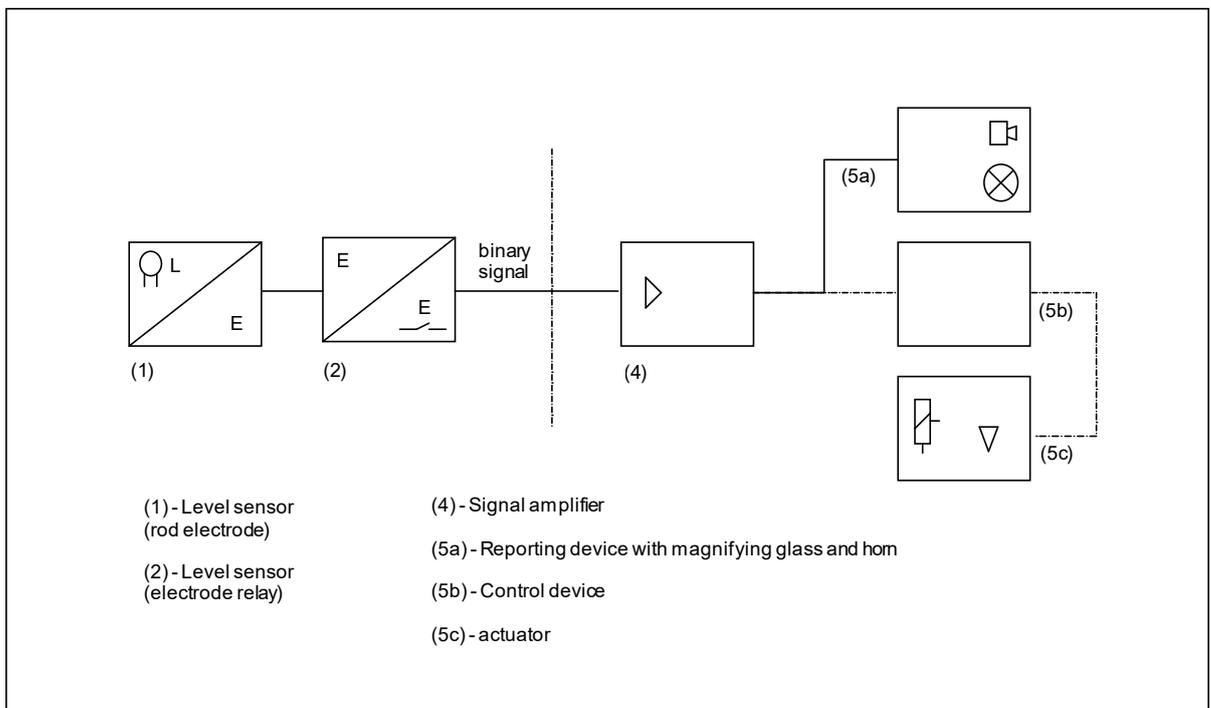
The electrical connection of the transmitter must be made as shown below. The cable between the level sensor and the transmitter must not exceed 100 m.



## 9. Structure of the overflow protection

The level limit switch consists of the level sensor (1) (conductive rod electrode) and the measuring transducer (2) (electrode relay NE-204) with binary switching output. This signal can be supplied directly or via a signal amplifier (4) to the signaling device (5a) or the control device (5b) with the actuator (5c). The system components of the overflow protection without a test mark, such as signal amplifier (4), signaling device (5a), control device (5b) and actuator (5c), must comply with sections 3 and 4 of the construction and testing principles for overflow protection (BPG-ÜS).

### 9.1 Overflow protection scheme



**9.2 Functional description**

The level sensor (1) in the form of a conductive electrode and the measuring transducer (2) in the form of an electrode relay form a unit as a level limit switch. The transmitter measures an electrode current that flows across the level sensor when the conductive storage fluid touches the tips of the electrode rods. A potential-free changeover contact is then activated in the measuring transducer (binary output signal). Contacts 1 and 2 are then switched on (alarm state). In order to ensure safe operation of the level limit switch, the transmitter is designed in such a way that:

- 1) If the auxiliary power fails, the same contact state (alarm) is switched as in the monitoring state when the electrode rods are touched by the storage liquid.
- 2) If there is a possible cable break between the level sensor and the measuring transducer, the alarm state is also switched to. This is achieved with the help of a resistor that is connected in parallel to the electrode rods in the level sensor head. A resting current must always flow across this resistance without the storage fluid touching the electrode. If the line is interrupted, the red LED lights up and the active circuit is switched to the alarm state.

The transmitter contains three light-emitting diodes (LEDs) for the visual display of the individual switching states:

- Transmitter de-energized:

green LED off	contacts 1 and 2 switched on
red LED off	
yellow LED off	Alarm status

- Transmitter connected to the network:

Electrode rods not touched by the storage liquid	green LED on	Contacts 2 and 3 switched on
	red LED off	
	yellow LED on	Monitoring state
Electrode rods touched by the storage fluid	green LED on	contacts 1 and 2 switched on
	red LED off	
	yellow LED off	Alarm status
Cable break between transmitter and level sensor	green LED on	Contacts 1 and 2 switched on
	red LED on	
	yellow LED off	Alarm status

## 10. Operation

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The level sensors are only intended for use in electrically conductive liquids. They should not be used in:

- Liquids that tend to form foam.
- Liquids with strong vapor formation and condensation.
- Liquids with components that tend to form deposits.

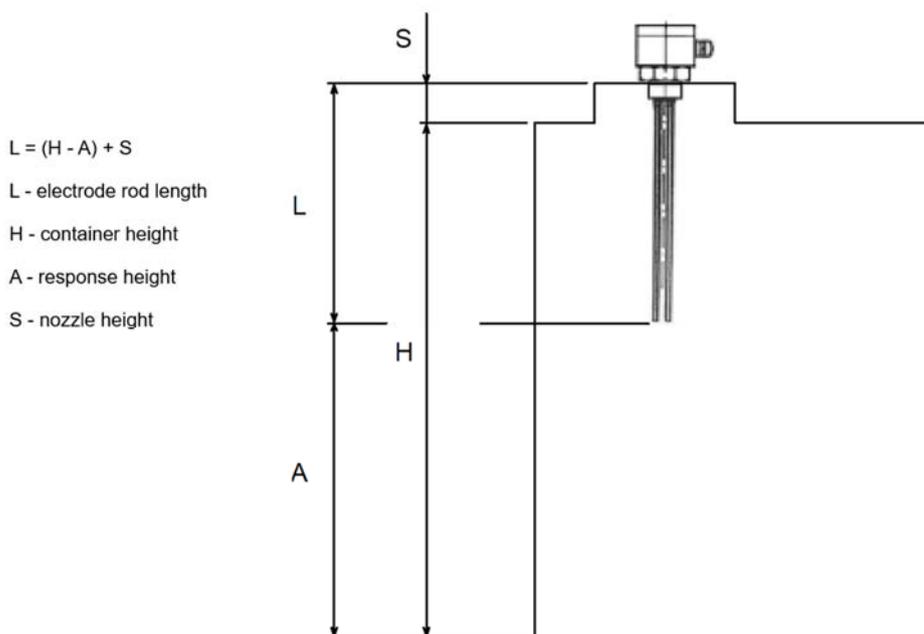
The intervals for operational inspection and cleaning of the electrode rods must be adapted to the operating conditions. They are shortened in particular if insulating residues from the liquids could stick to the electrode rods of the level sensors or there is a risk of a corrosive attack on the rods.

## 11. Setting instructions

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Neither the level sensor nor the transmitter can have their settings changed. The electrode length is manufactured upon customer request. However, it can be reduced by sawing during assembly. In this case, it is important to ensure that both electrodes remain the same length and that the shrink tubing is shortened so that bare ends of greater than or equal to 10 mm are retained.

Due to the permissible degree of filling of the containers, the liquid level which corresponds to the response level of the overfill protection device must be determined using the ZG-ÜS construction and testing kits, appendix 1. From this, the electrode rod length can be determined as a measurement between the response height and the sealing surface of the screw-in thread of the level sensor as follows:



## 12. Fault messages, error messages

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Three events can lead to malfunctions, whereby the measuring transducer (electrode relay NE-204) then automatically switches to the alarm state:

- 1) Failure of the auxiliary power (electrode relay no voltage):  
Since the measuring transducer in the active circuit works according to the closed-circuit principle, the contact state when the auxiliary power fails is the same as in the operating state when the storage liquid touches the electrode rods.
  - 2) Interruption in the line between the transmitter and the level sensor:  
The line between the measuring transducer and the level sensor is monitored using a resistor connected in parallel with the electrode rods. If there is an interruption, the red LED lights up and the contact status of the active circuit also switches to the alarm state.
  - 3) Short circuit in the connecting cable between the measuring transducer and the level detector or short circuit in the electrode rods:  
In this case, the alarm state is also switched to. However, the electrode relay signals this in the same way as if the storage fluid had touched the electrode rods.
- The error messages are signalled visually:
  - All LEDs off: Measuring transducer de-energized: alarm state
  - Red and green LED light up, yellow LED off: break in the cable: alarm state

## 13. Maintenance

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The functionality of the overflow protection must be checked at appropriate intervals, but at least once a year. It is the operator's responsibility to choose the type of check and the time intervals within the specified period.

The test must be carried out in such a way that the correct functioning of the overflow protection in the interaction of all components is proven. This is guaranteed when the response height is reached during filling. If filling up to the response level is not practical, the level sensor must be made to respond through suitable simulation of the fill level or the physical measuring effect. If the functionality of the level detector/transducer can be identified in another way (exclusion of malfunctions), the test can also be carried out by simulating the corresponding output signal. Further information on the testing methodology can be found, for example, in the VDI/VDE 2180 guideline, sheet 4.

## 14. Technical Information

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Operating instructions, data sheet, approvals and further information via the QR code on the device or via [www.kobold.com](http://www.kobold.com)

## 15. Order Codes

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Operating instructions, data sheet, approvals and further information via the QR code on the device or via [www.kobold.com](http://www.kobold.com)

## 16. Dimensions

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Operating instructions, data sheet, approvals and further information via the QR code on the device or via [www.kobold.com](http://www.kobold.com)

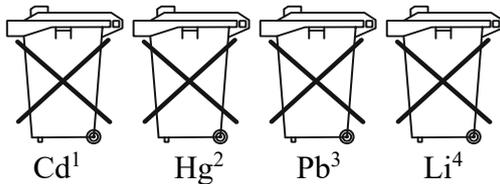
## 17. Disposal

### 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

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

**Conductive Level Limit Switches                      model: NEW, NE-204**

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

<b>2014/35/EU</b>	<b>Low Voltage Directive</b>
<b>2014/30/EU</b>	<b>EMC Directive</b>
<b>2011/65/EU</b>	<b>RoHS (category 9)</b>
<b>2015/863/EU</b>	<b>Delegated Directive (RoHS III)</b>

Also, the following standards are fulfilled:

**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 up to 1 GHz)

**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, 05 March 2024



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