



Operating Instruction for Conductive Level Switch

Model: LNK



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Manufactured and sold by:

Kobold Messring GmbH
Nordring 22-24
D-65719 Hofheim
Tel.: +49(0)6192-2990
Fax: +49(0)6192-23398
E-Mail: info.de@kobold.com
Internet: www.kobold.com

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:

- Conductive Level Switch model: LNK

4. Regulation Use

Any use of the Conductive Level Switch, model: LNK, 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

The conductive KOBOLD level probes LNK together with the transducer for head mounting or the external evaluating electronic are used for level detecting. This method is based on the evaluation of the electrical conductivity of the medium. In combination with the KOBOLD LZE or LZE-R weld-in sleeves, the probe provides a measuring point that has no dead space and meets hygiene standards (EHEDG approval certificate). This level switch is therefore ideally suited for CIP/SIP cleaning.

The level switch is available with 1 or 2 - 4 electrodes. As an option, they can be delivered with an E-CTFE coating. This allows foaming media to be detected reliably.

The output signal from the probes with head mounted transmitter can be connected directly to a PLC for evaluation. This means lower installation costs, minimum wiring requirements and a high degree of noise immunity.

The device is available with an optional M12x1 plug connector.

5.1. Head transmitter LNR (Option LNK-...NPK, LNK-...NPS)

A usage of the head transmitter LNR is only possible, when the LNK as a 2-stem probe, contains an earth stem and a monitoring stem.

The transmitter integrated in the electrode head provides a control voltage between the detecting electrode and the earth electrode. When the electrodes dip into a conductive liquid, a small alternating current starts flowing. An integrated switching amplifier detects this alternating current and switches the 24 V_{DC} active output accurately, as soon as an adjusted trigger threshold is crossed. When the liquid drops below the limit value electrodes, the output becomes inactive again.

5.2. External electrode relay (e.g. NE-104, 304)

When the LNK is used as a 3-stem or 4-stem probe (2 or 3 switching points), the evaluation takes place with an external electrode relay (see instruction manual and technical details of the external electrode relay).

In order to get an additional switching point, the electrically conductive and grounded vessel wall can be used as ground terminal. Therefore, the ground electrode can be used as an additional switching electrode.

6. Mechanical Connection

- Please note the maximum torque while mounting the instrument: 10 – 20 Nm (measuring instrument connection G ½) and 25 – 30 Nm (measuring instrument connection G 1).
- The electrodes must be mounted in a vertical position in the lid or the ground of the vessel which must be detected.
- The mounting must be done in a way that there is no short circuit of the electrodes neither to the walls of the vessel nor to itself.
- Note during mounting that the electrodes do not bend and the medium can drain off easily when they are not longer touched by the fluid.
- The ground electrode must be at least as long as the longest switching electrode.
- If not using the weld-in sleeves type LZE one must note there is a conducting connection to the wall of the vessel. An additional grounding to the pipework or the wall of the vessel is necessary when using an isolating sealing.

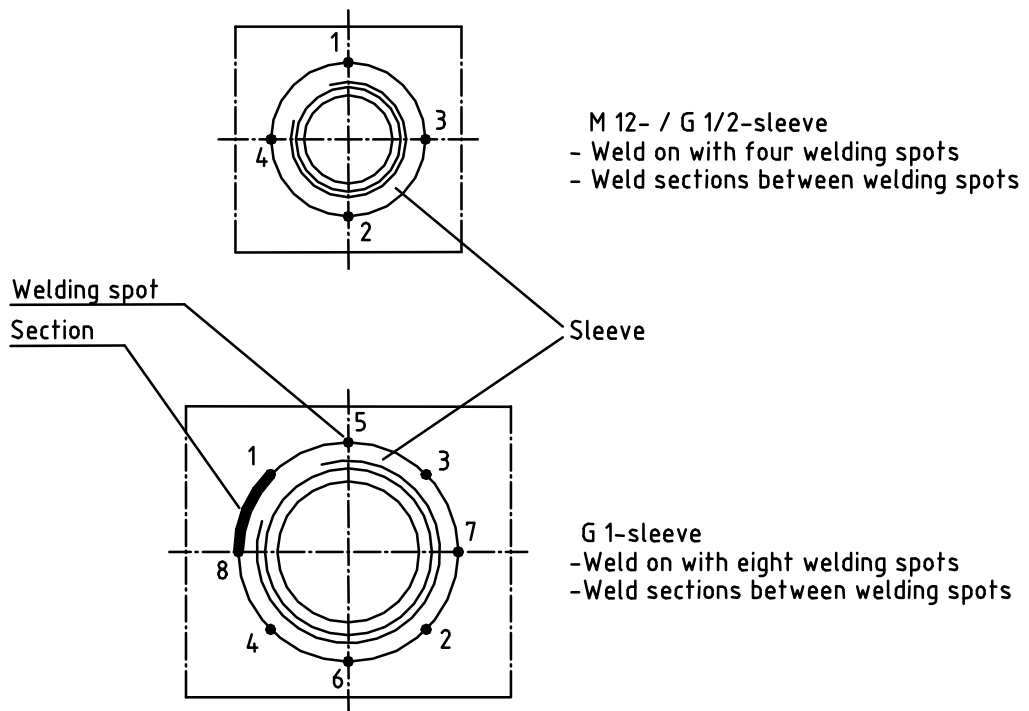
Shortening the electrodes:

- The tip of the electrodes is equal to the switching point and can be shortened if necessary.
- Note, that the bracing of the electrode in the thread-piece is not too heavily loaded during shortening.
- Do not harm the isolation of the electrode.
- After shortening, make sure that the E-CTFE isolation is removed of about a length of 5 mm from the tip of the electrode.

6.1. Welding details for sleeves LZE

Welding in tanks and pipes:

1. Drill a hole with a diameter equivalent to outer diameter of the sleeve; max. tolerance +0,2 mm
2. Weld the sleeve at 4 points
3. Screw in the blind socket
4. Weld the sleeve segments crosswise between already welded 4 points.
4 sleeve segments for M12 and G 1/2"; 8 sleeve parts for G1"



Attention! In order to avoid deforming or red-hot turning of the sleeve, pauses between individual sleeve segments should be sufficient enough to allow cooling down of the sleeve.

7. Electrical Connection



Attention! Make sure that the voltage values of your system accord to the voltage values of the monitoring unit.

- Make sure that the supply wires are de-energised.
- Connect the supply wires and the output signal **to the shown pins**.
- We recommend the use of wires with cross sectional area of min. 0,25 mm²



Attention! A wrong connection of the plug pins can damage the unit's electronic!

7.1. Connection without evaluating electronic (head transmitter) Model LNK-...00K, LNK-...00S

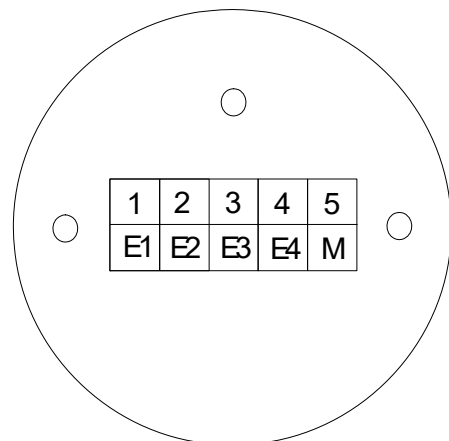
Reference: wall of vessel

(only possible with an electrical
conductive connection to the metal tank)

- 1 Electrode 1
- 2 Electrode 2
- 3 Electrode 3
- 4 Electrode 4
- 5 ⚡ earthing of housing (Reference)

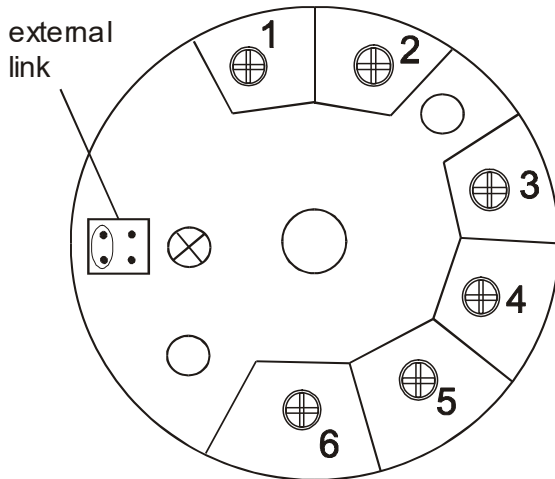
Reference: longest electrode

- 1 Reference electrode
- 2 Electrode 2
- 3 Electrode 3
- 4 Electrode 4
- 5 ⚡ earthing of housing



7.2. Connection with evaluating electronic (head transmitter) Model LNK-...NPK, LNK-...NPS

1. Electrode unit: Switching point equal to the electrode length, earthing through vessel wall
2. Electrode unit: 1 electrode as switching point



- 1 Power supply: $+V_s$ / GND*
- 2 Power supply: GND / $+V_s$ *
- 3 Output: Transistor PNP
($U_{off} = +V_s - 1\text{ V}$)
- 4 Sensitivity: $+V_s$ / GND / open
- 5 Electrode 1: Ground electrode or wall of vessel
- 6 Electrode 2: Detecting sensor electrode

* see chapter 7.2.1

7.2.1. Setting the full /empty signal function:

The output function (full / empty signal) is switchable by changing the polarity of the supply voltage.

Power supply		Probe	Output Terminal 3	LED
Terminal 1	Terminal 2			
GND	$+V_s$	immersed	U_{out}	on
		dry	0 V	off
$+V_s$	GND	immersed	0 V	on
		dry	U_{out}	off

7.2.2. Setting the sensitivity:

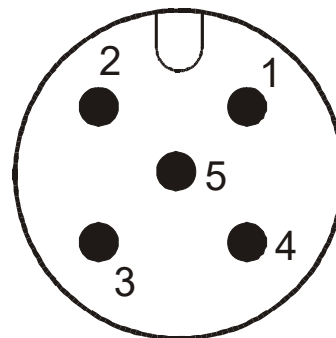
1. Configure the instrument according to sensitivity step 1
2. Cover probe with the medium to be measured
3. If the Probe LED does not light up, try steps 2, 3 and 4 in succession, until the probe LED is illuminated.

Step	Sensitivity	Connection 4	Jumper position
1	0.1 kΩ	+ V _s	inside
2	1 kΩ	+ V _s	outside
3	10 kΩ	open	outside
4	100 kΩ	GND	outside

**7.3. Plug assignment of M12-plug without evaluating electronics (head transmitter)
Model LNK-...00S**

Reference: wall of vessel
(only possible with an electrical conductive connection to the metal tank)

- 1 Electrode 1
- 2 Electrode 2
- 3 Earthing of housing (Reference)
- 4 Electrode 3
- 5 Electrode 4

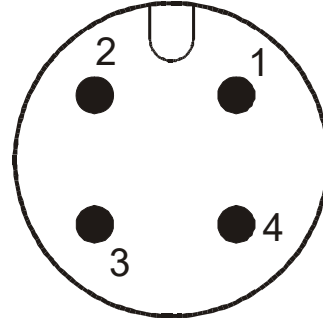


Reference: longest electrode

- 1 Reference electrode
- 2 Electrode 2
- 3 Earthing of housing
- 4 Electrode 3
- 5 Electrode 4

7.4. Plug assignment of M12-plug with evaluating electronics (head transmitter) Model LNK-...NPS

- 1 Power Supply + V_s / GND
- 2 Sensitivity + V_s / GND / open
- 3 Power Supply GND / + V_s
- 4 Output: Transistor PNP



7.4.1. Setting the output function at option M12-plug

The output function (full/empty signal) is switchable by changing the polarity of the supply voltage.

Power Supply Plug-PIN 1	Plug-PIN 3	Sensor	Output Plug-PIN 4	LED
GND	+ V_s	immersed	U_{out}	on
		dry	0 V	off
+ V_s	GND	immersed	0 V	on
		dry	U_{out}	off

7.4.2. Setting the sensitivity at option M12-plug

1. Configure the instrument according to sensitivity step 1
2. Cover probe with the medium to be measured
3. If the Probe LED does not light up, try positions 2, 3 and 4, until the probe LED is illuminated.

Step	Sensitivity	Plug-Pin 2	Jumper position
1	0.1 k Ω	+ V_s	inside
2	1 k Ω	+ V_s	outside
3	10 k Ω	open	outside
4	100 k Ω	GND	outside

8. Technical Information

Measuring principle:	conductive
Process temperature:	0...100 °C, 150 °C for CIP process
Ambient temperature:	0...70 °C
Operating pressure:	max. 10 bar

Material

• Head, thread supports:	stainless steel 1.4404
• Insulating section:	PEEK
• Electrode stem:	stainless steel 1.4404
• Stem coating:	E-CTFE, coating 0.3 mm
Electrode length:	4 - 1500 mm
Process connection:	G ½ with 1 electrode stem G 1 with 2 - 4 electrode stems
Connection:	Threaded cable gland connection M16x1.5 optional M12x1 plug
Protection:	IP 67
Min. conductivity:	10 µS/cm
Weight:	approx. 0.6 kg

Switch- electronic

For 1-or 2-stem probe:

Internal Module for one switching point

Option NPK/NPS

Power supply:	15...36 V _{DC} / 15 mA
Electrode voltage:	approx. 2 V _{AC} / 600 Hz
Sensitivity (adjustable):	4 steps 0.1 / 1 / 10 / 100 kΩ
Function:	full / empty report (determined via the polarity of the supply voltage)
Output:	PNP Transistor output (open coll.), U _{out} = +V _s - 1 V max. 50 mA, short-circuit-proof
Switch delay (fixed):	1 s
Weight:	approx. 40 g
LED-Indication:	Illuminated when medium contacts the electrodes

additional technical details see separate data sheet

For 1- up to 4-stem probe:

External electrode relay NE104 and NE304

(see separate data sheet)

9. Order Codes

Example order: **LNK-1 2 0 A AAA 00K**

Model	Design (Process connection)	Electrode material	Electrode coating	Length of 1. stem	Length of 2. stem	Length of 3. stem	Length of 4. stem	Evaluation/ electronic connection
LNK-	1 = electrode (G 1/2) 2 = 2 electrodes (G 1)2 3 = 3 electrodes (G 1) 4 = 4 electrodes (G 1)	2 = stainless steel	0 = without coating E = E-CTFE-coating	A = 4 mm stump B = 100 mm C = 250 mm D = 500 mm E = 750 mm F = 1000 mm G = 1500 mm	A = 4 mm stump B = 100 mm C = 250 mm D = 500 mm E = 750 mm F = 1000 mm G = 1500 mm 0 = no other stem	A = 4 mm stump B = 100 mm C = 250 mm D = 500 mm E = 750 mm F = 1000 mm G = 1500 mm 0 = no other stem	A = 4 mm stump B = 100 mm C = 250 mm D = 500 mm E = 750 mm F = 1000 mm G = 1500 mm 0 = no other stem	00K = without electronic, cable con. M16x1.5 00S = without electronic, M12x1 plug Only for 1- or 2-stem probe: NPK = switching electronic; PNP switch output, thread. cable con. NPS = switching electronic; PNP switch output, M12x1 plug

Note:

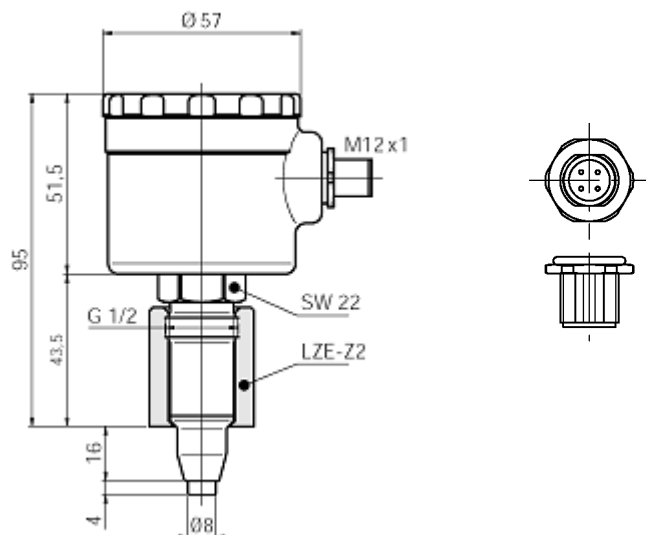
- EHEDG certification of the connection system in combination with weld-in sleeve LZE
- External switch electronic: Electrode relay NE 104 and NE 304

10. Maintenance

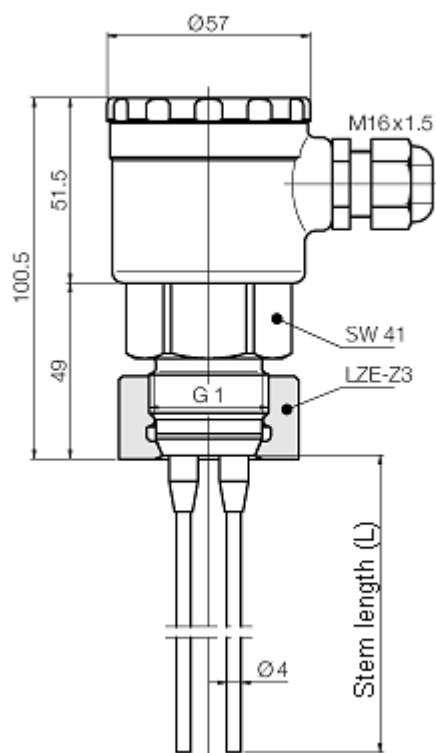
The conductive level electrodes work completely maintenance free. Occasionally, the electrode tips should be checked for deposits or corrosion and cleaned accordingly. Insulated layers can result in false alarms.

11. Dimensions

1 stem probe



Multi stem probe



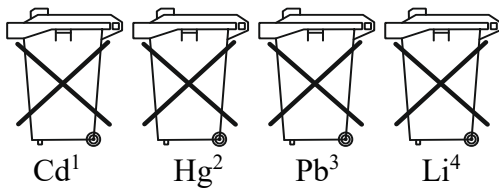
12. Disposal

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.

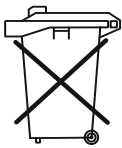
Batteries

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

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

Conductive Level Switch Model: LNK-...

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

EN IEC 61000-6-4:2019

Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments

EN IEC 61000-6-2:2019

Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments

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 EEC guidelines are fulfilled:

2014/30/EU	EMC Directive
2011/65/EU	RoHS (category 9)
2015/863/EU	Delegated Directive (RoHS III)

We confirm that the materials used are fully suitable for direct contact with food and comply with **EC Regulation**

1935/2004

10/2011,

and **(FDA) CFR21.**

Hofheim, 22 Sept. 2022

H. Volz
General Manager

M. Wenzel
Proxy Holder

14. UK Declaration of Conformity

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

Conductive Level Switch Model: LNK-...

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

BS EN 61000-6-4:2019

Electromagnetic compatibility (EMC). Generic standards. Emission standard for industrial environments

BS EN 61000-6-2:2019

Degrees of protection provided by enclosures (IP-Code)

BS 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 UK guidelines are fulfilled:

S.I. 2016/1091

Electromagnetic Compatibility Regulations 2016

S.I. 2012/3032

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

We confirm that the materials used comply with FDA, CFR21.

Hofheim, 22 Sept. 2022



H. Volz
General Manager



M. Wenzel
Proxy Holder