

Operating Instructions for Microwave Level Switch

Model: LNM



1. Contents

1. Contents.....	2
2. Note	3
3. Instrument Inspection.....	3
4. Regulation Use.....	3
5. Operating Principle.....	4
6. Mechanical Connection.....	5
6.1 Installation design "Foodstuffs" with hygienic installation system LZE.....	5
6.2 Installation design "Industry" in G1/2 thread	6
7. Electrical Connection	6
7.1 Model with screwed cable gland Terminal pin assignment of the 3-pole clamp	7
7.2 Model with round pin plug Connector assignment of the M12-plug	7
8. Technical Information.....	8
9. Order Codes	8
10. Dimensions	9
11. Declaration of Conformance	10

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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 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 EWG-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:

- Microwave Level Switch model: LNM
- Operating Instructions

4. Regulation Use

Any use of the Microwave Level Switch, model: LNM, 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 KOBOLD LNM Microwave Level Switch is used for detecting liquid levels. The microwave field penetrates several millimetres into the medium. Condensate or adherent remains of the medium are not detected.

By using this principle of measurement it is also possible to detect non-conductive media. The level switch is particularly suitable for use with foaming media because the foam itself is not detected. The output of the level monitoring device only switches when the coupling section is completely covered by the medium.

This means it is possible to install it into tanks regardless of position.

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 very well suited for CIP/SIP cleaning. Adapter sleeves are also available for different process connections so that the device can also be used in existing installations. Because the electronics are already integrated no other evaluating instrument is necessary. The output signal can therefore be transmitted directly to a PLC for further processing.

6. Mechanical Connection

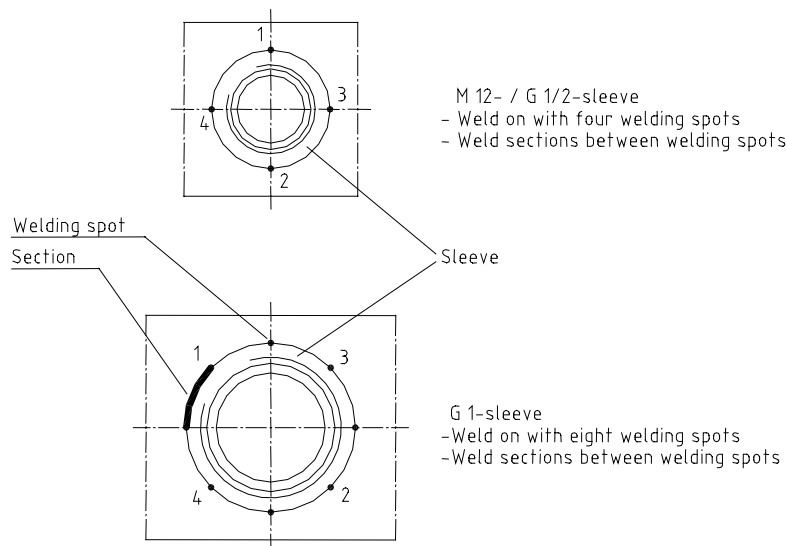
Installation: Pipe or vessel
Installation position: independent, the sensor needs to be completely wetted for switching

6.1 Installation design “Foodstuffs” with hygienic installation system LZE

Welding and mounting details:

Welding in tanks and pipes:

1. Drill a hole with 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 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 during welding, pauses between individual sleeve segments should be sufficient enough to allow cooling down of the sleeve.

- Pay attention to the maximum allowable torque of 5 – 10 Nm (instrument connection M12) and 10 – 15 Nm (instrument connection G1/2) when you screw in the sensor.
- Please avoid screwing in and unscrewing the sensor from the sleeve, because on high stress the sealing edge can distort and the process connection can get leaky.
The sealing system LZE is designed for CIP- and SIP-cleaning.

6.2 Installation design “Industry” in G1/2 thread

If the sleeve LZE is not used for the installation of the level switch LNM, it is possible to seal the screw thread with an adequate sealing material. Thus an installation is possible in a pipe as well as in a vessel.

No conductive connection needs to be established to the vessel or to the pipe.

7. Electrical Connection



Attention! Make sure that the voltage values of your system correspond with the voltage values of the instrument.

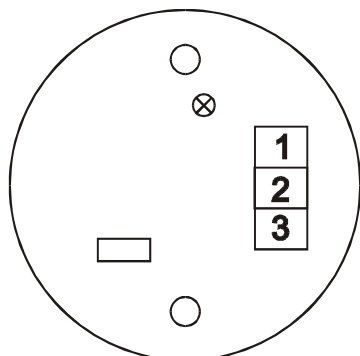
- Make sure that the supply wires are powerless.
- Connect the power supply and the output signal according to the plug wiring given as follows.
- We recommend to use wires with cross sectional area of min. 0,25 mm²



Attention! Incorrect wiring will lead to damage of the unit's electronics.

7.1 Model with screwed cable gland

Terminal pin assignment of the 3-pole clamp

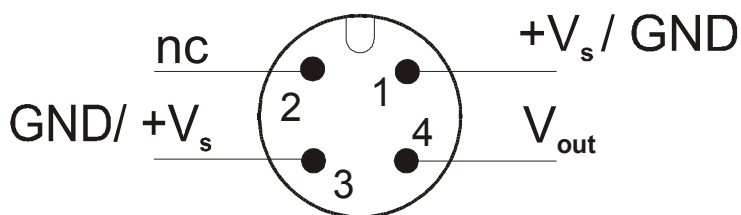


Power supply clamp 1	Power supply clamp 2	Sensor	Output clamp 3	Switching function
GND	$+V_s$	immersed	approx. 0 V	N/C contact
		dry	approx. V_s	N/C contact
$+V_s$	GND	Immersed	approx. V_s	N/O contact
		dry	approx. 0 V	N/O contact

The output function (N/C / N/O function) is switched by changing the polarity of the power supply.

7.2 Model with round pin plug

Connector assignment of the M12-plug



Power supply plug PIN 1	Power supply plug PIN 3	Sensor	Output plug PIN 4	Switching function
GND	$+V_s$	immersed	approx. 0 V	N/C contact
		dry	approx. V_s	N/C contact
$+V_s$	GND	Immersed	approx. V_s	N/O contact
		dry	approx. 0 V	N/O contact

The output function (N/C / N/O function) is switched by changing the polarity of the power supply.

8. Technical Information

Method of measurement:	microwave technology
Process temperature:	0...100 °C 150 °C max. 30 min for CIP-Process
Ambient temperature:	0...70 °C
Operating pressure:	max. 10 bar
Materials:	
• head, screwed gland:	stainless steel 1.4404
• coupling piece:	PEEK
Process connection:	G1/2, M12x1.5, hygienic weld-on sleeves LZE, LZE-R
Connection:	cable gland M16x1.5
Terminal:	3-pole, (optional plug M12x1)
Function:	full/empty signal (set by polarity of supply voltage)
Output:	open collector, PNP, 50 mA
Switching delay (fixed):	0.2 s (0.3 – 1.0 s on request)
Power supply:	18...36 V _{DC} , < 50 mA without load
Protection:	IP 67
Weight:	approximately 0.5 kg
Dielectric constant of the medium:	$\epsilon_R > 20$; Option: ϵ_R 2-20

9. Order Codes

Example: LNM-12 G4 3PK

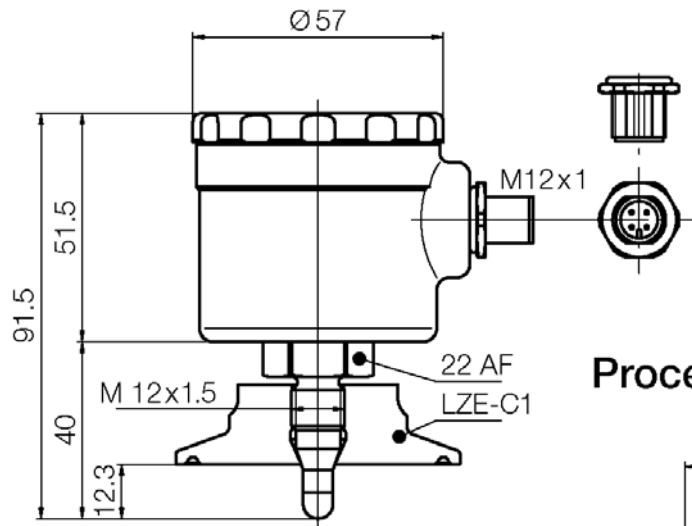
Design	Material	Process connection	Sensitivity	Model	Electrical connection
Foodstuffs*	Stainless steel/PEEK	G 1/2	ϵ_R : >20	LNM-12 G4 A...	... 3PK = M16x1.5 threaded cable connection ... 3PS = M12x1 plug
Industry	Stainless steel/PEEK	G 1/2	ϵ_R : >20	LNM-22 G4 A...	
Foodstuffs*	Stainless steel/PEEK	M12x1,5	ϵ_R : >20	LNM-12 M3 A...	
Foodstuffs*	Stainless steel/PEEK	M12x1,5	ϵ_R : 2-20	LNM-12 M3 B...	

*Installation only possible with EHEDG sleeve

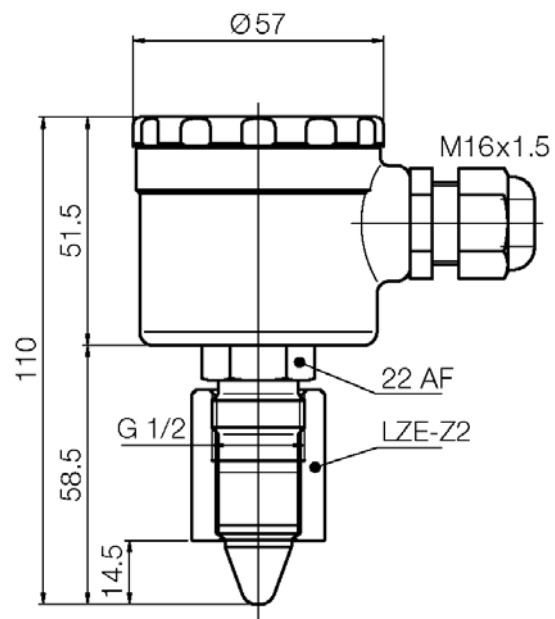
EHEDG-certification of the connection system in combination with weld-in sleeve LZE

10. Dimensions

Process connection M12x1.5



Process connection G 1/2



11. Declaration of Conformance

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

Microwave Level Switch Model: LNM

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

EN 61326: 1997 +A1:1998 +A2: 2001

Electrical equipment for measurement, control, and laboratory use

- Interference Stability: according to EN 61326/A1 annex A table A.1
Performance criteria: according table 2, continuous unobserved operation
- Interference Emission: according to EN 61326/A1
Limit values: according table 4, equipment of class B

EN 61010-11 1993

Safety requirements for electrical measuring, control and laboratory instruments

Also the following EWG guidelines are fulfilled:

89/336 EEC

EMC Directive

We confirm that the material PEEK is approved by FDA without any limitations for direct contact with food and pharma products and fulfils the corresponding EU-directives. In particular, these are

FDA Approval-No. 21 CFR 177.2415

EU Directive 2002/72/EG

Hofheim, 16. August 2005



H. Peters
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