# Operating Instructions

# for

# Resistive Temperature Sensor

## Model: LTS

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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-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:
- Resistive Temperature Sensor model: LTS

# 4. Regulation Use

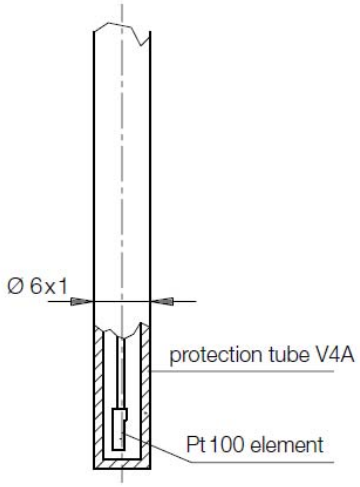
Any use of the Resistive Temperature Sensor, model: LTS, which exceeds the manufacturer's specification, may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

# 5. Operating Principle

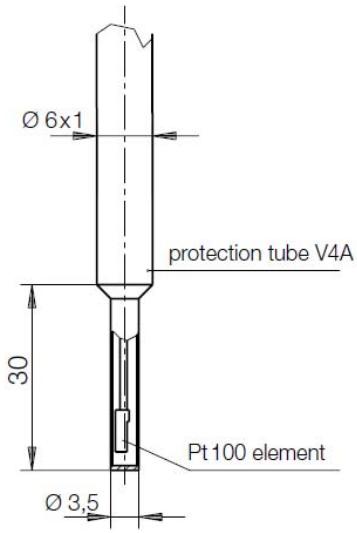
The change in resistance of platinum in relation to the temperature to be measured is used for temperature measurement with the KOBOLD Resistive Temperature Sensors LTS.
The devices are connected electrically with 2- or 3-wire technology, depending on the input of the evaluation device and the line length. Alternatively, the temperature sensor can be connected to a 4-20 mA current input (2-wire current loop) through the built-in 2-wire transmitter. The temperature sensors with a connection that is cavity free (...T, ...M) are fitted with a food-compatible metallic sealing system, that forms a hygienic measuring point in conjunction with the associated weld-in sleeve LZE (confirmed by the EHEDG).

**Sensor Tips and Response Times**

All temperature sensors are available with tapered tips to ensure faster response times. The times specified below refer to a resistive temperature sensor immersed in boiling water.




Sensor tip ø 6 mm
Halftime: t50 ≤3,0 s
90 %-time: t90 ≤8,0 s




Sensor tip ø 3.5 mm
Halftime: t50 ≤0,5 s
90 %-time: t90 ≤1,5 s

## 5.1 Special

The temperature sensors with neck well are suited for measuring permanently high temperatures (up to 250 °C).

Appropriate neck tube versions should be used at process temperatures above 70 °C if the transmitter is integrated, and above 100 °C in case of a separated transmitter.

# 6. Mechanical Connection

The LTS temperature sensors are available with a non-hygienic G ½ process connector (R4) or alternatively with hygienic connections for food processing.

Only with these process connection options M12x1.5 (M3) and G ½ (G4), combined with our hygienic LZE fittings, an EHEDG-certified dead space free monitoring point based on hygienic design principles is possible.
(See chapter 11. Accessories)

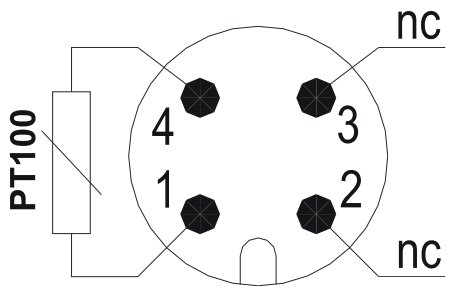
Proper torque values for these two options are:
M12x1.5 = 10 - 15 Nm
G ½ = 15 - 20 Nm

# 7. Electrical Connection

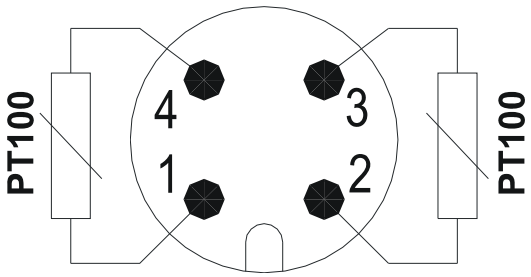
## 7.1 Pt 100 without transmitter

### 7.1.1 Plug connection at compact version (LTS-K…M0 and LTS-A…M0)

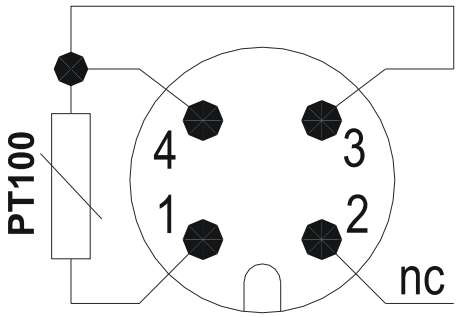
1 x Pt 100 2-wire




2 x Pt 100 2-wire



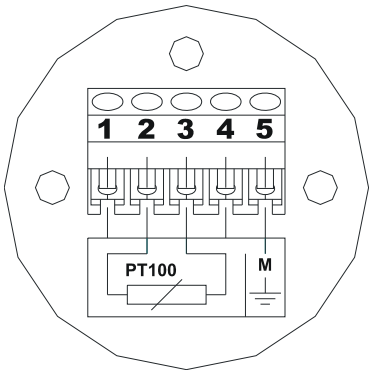

1 x Pt 100 3-wire



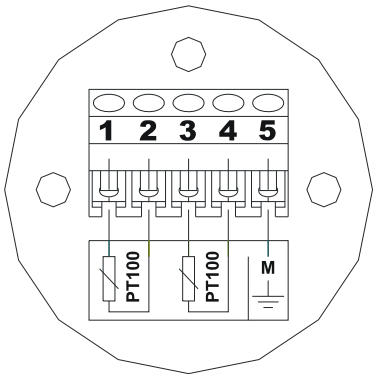
### 7.1.2 Terminal connections at version connection box (LTS-A…K0)

cable connection M16x1,5

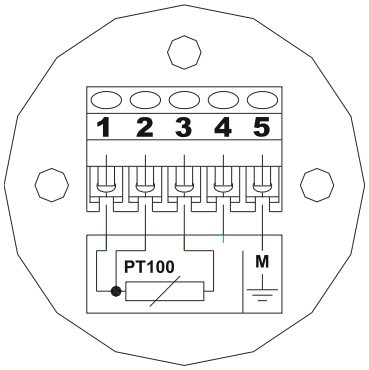
1 x Pt 100 2-wire




2 x Pt 100 2-wire




1 x Pt 100 3-wire



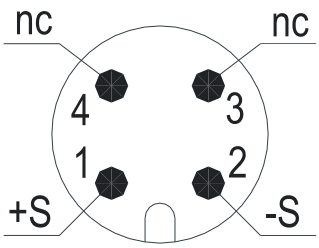
## 7.2 Pt 100 with transmitter

The transmitter converts the resistance of the PT100 into a temperature-proportional 4-20mA standard current signal.
Thus, the current loop carries both the supply current and the measurement signals.
The module is integrated into the head of the temperature sensor.

- Make sure the electrical power supply cables are de-energized.
- Connect the transmitter as shown in the connection schemes below.
- We recommend a minimum power supply cable cross section of 0.25 mm².

**Warning! Wrong electrical connections may lead to the destruction of the electronic circuit!**

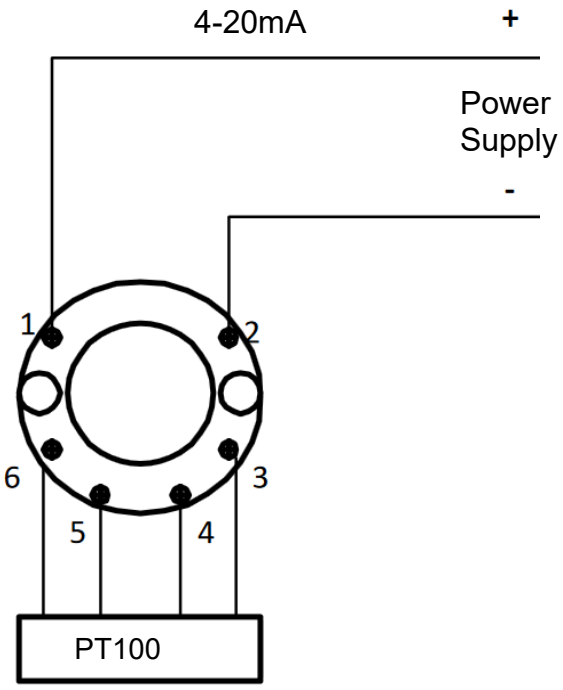
### 7.2.1 Plug connection at compact version (LTS-K…6Mx)




4...20 mA
(current loop)

### 7.2.2 Terminal connections at version connection box (LTS-A…6Kx)

connection plug M16x1,5



## 8. Technical Information

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

## 9. Order Codes

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

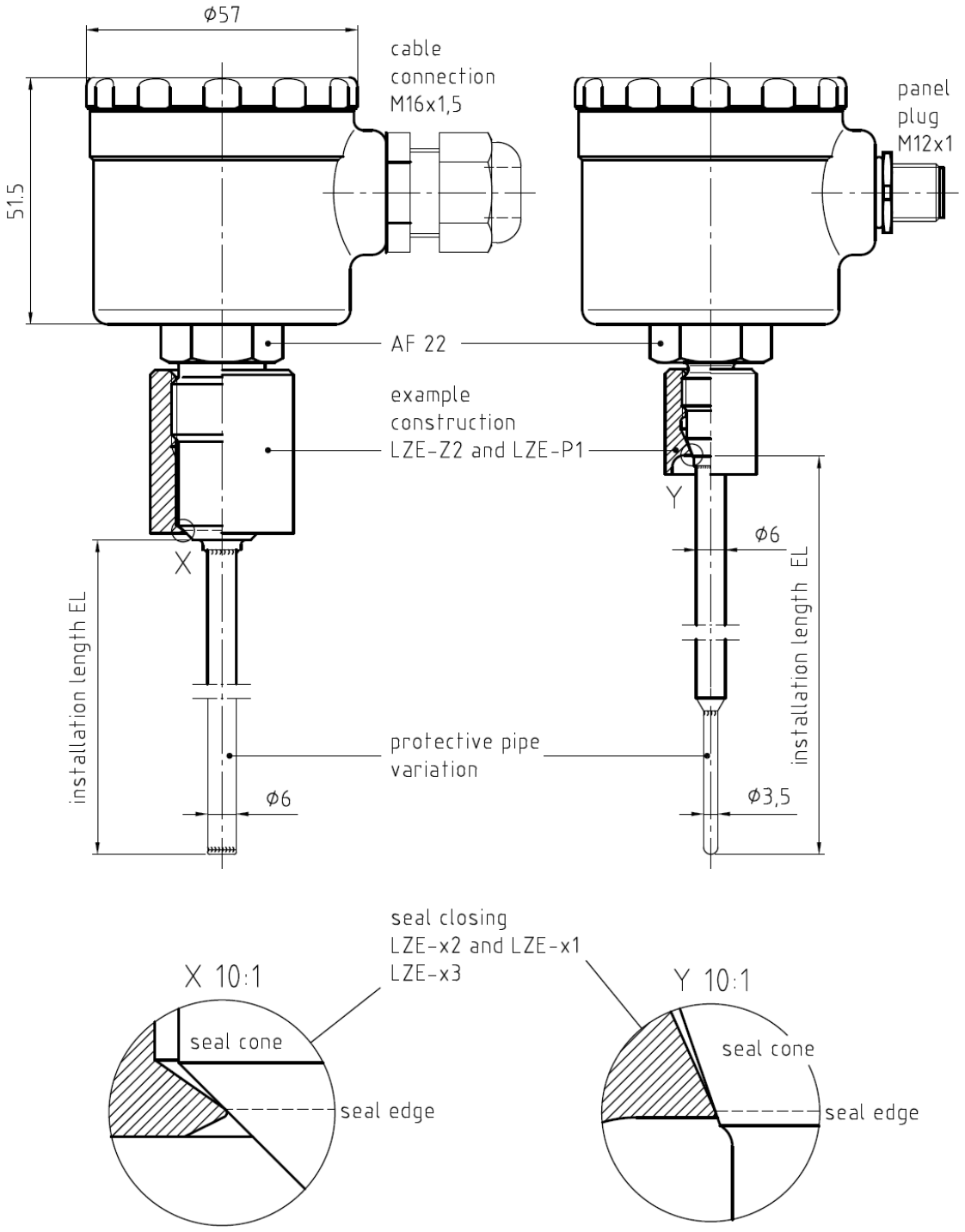
## 10. Dimensions

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

# 11. Accessories

If you need a hygienic installation, use the sleeve system LZE (see data sheet in "Food processing catalogue" L1). The position of the Pg-conduit thread of the screwed-in device is marked on the sleeve.

Example: Installation of a temperature sensor with sleeve LZE



## Hygienic Installation Systems LZE for temperature sensor LTS

**Mounting sleeves, EHEDG-certified**

| Description | Measuring unit connection | |
|---|---|---|
| | **M12x1.5** | **G ½** |
| cylinder sleeve | | **LZE-Z2** |
| cylinder sleeve with test hole | | **LZE-T2** |
| cylinder sleeve low form | | **LZE-N2** |
| cylinder sleeve with collar | **LZE-P1** | **LZE-P2** |
| collar sleeve | **LZE-K1** | **LZE-K2** |
| ball sleeve | **LZE-U1** | **LZE-U2** |
| collar compression fitting | **LZE-M1** | |
| ball compression fitting | **LZE-S1** | |
| adapter: | | |
| conical connection DIN 11851 | **LZE-L1** | **LZE-L2** |
| aseptic lap-joint flange DIN 11864 | **LZE-A1** | **LZE-A2** |
| VARIVENT® | **LZE-V1** | **LZE-V2** |
| Tri-Clamp® | **LZE-C1** | **LZE-C2** |
| G 1 adapter | | **LZE-D2** |
| capped stub* | **LZE-B1** | **LZE-B2** |
| **Starting torque (Nm)** | **10-15** | **15-20** |

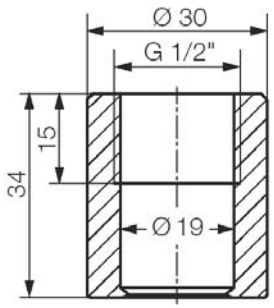
*** all sleeves must be equipped a capped stub to prevent warping during welding**

**Weld-in Fittings, EHEDG certified**

| Description | Model | Measuring unit connection | Pipe nominal width |
|---|---|---|---|
| Weld-in fittings | **LZE-R** | **1** = M12x1.5<br>**2** = G ½ | **15** =DN 15 (only with M12x1.5)<br>**25** =DN 25<br>**40** =DN 40<br>**50** =DN 50<br>**65** =DN 65<br>**80** =DN 80 |

### For example LTS-…G4..

Model: LZE-Z2 (G ½)



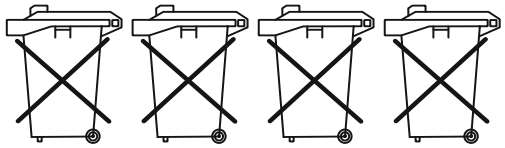
# 12. Disposal

**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**

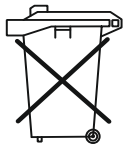
Batteries containing pollutants are marked with a sign consisting of a crossed-out garbage can and the chemical symbol (Cd, Hg, Li or Pb) of the heavy metal that is decisive for the classification as containing pollutants:



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**



# 13. EU Declaration of Conformance

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

**Resistive Temperature Sensor Model: LTS**

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

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

Also, the following standards are fulfilled:

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

**Additional for model LTS-A******6K***

**EN 61326-1:2013**
Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements

**Additional for model LTS-K******6M***

**EN 61326-1:2013**
Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
(Appendix A, Class B) additional error < 1 % FS
When using long wires, suitable external measures against transient voltages must be taken.

Hofheim, 22 Sept 2023

H. Volz
General Manager

J. Burke
Compliance Manager

# 14. UK Declaration of Conformity

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

**Resistive Temperature Sensor Model: LTS**

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

| | |
|---|---|
| **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 |

Also, the following standards are fulfilled:

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

**Additional for model LTS-A******6K***

**BS EN 61326-1:2013**
Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements

**Additional for model LTS-K******6M***

**BS EN 61326-1:2013**
Electrical equipment for measurement, control and laboratory use. EMC requirements. General requirements
(Appendix A, Class B) additional error < 1 % FS
When using long wires, suitable external measures against transient voltages must be taken.

Hofheim, 22 Sept 2023

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General Manager

J. Burke
Compliance Manager