

# Temperature Probes for Heat Meters

Basic types 902427/10 and 902427/11

Basic type 902437/10



Operating Manual

90242700T90Z001K000

V2.00/EN/00697052





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# 1 Safety information

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## General

This manual contains information that must be observed in the interest of your own safety and to avoid material damage. This information is supported by symbols which are used in this manual as indicated.

Please read this manual before starting up the device. Store this manual in a place that is accessible to all users at all times.

If difficulties occur during startup, please do not intervene in any way that could jeopardize your warranty rights!

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The following standards and directives apply to the use of pairs of temperature probes for measuring the inflow and outflow temperature in a heat exchanger system:

- Product standard DIN EN 1434
- Product standard DIN EN 60751
- Directive 2014/32/EU, Annex I and MI-004
- German Weights and Measures Act (MessEG)
- German Weights and Measures Directive (MessEV)

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Specifications for electrical installations must be observed.

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All installation and maintenance work must be performed by specialist staff trained for this task.

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All notes listed in the installation instructions must be observed.

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Identification markings and metrology-relevant safety markings/main stamps must not be damaged or removed – otherwise the temperature probe is no longer admissible for use!

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Route the measurement signal lines so that they are at least 50 mm away from other lines, such as grid supply lines and data transmission lines. We recommend installing lines and computer units 300 mm away from strong electromagnetic fields, e.g. from frequency-controlled pumps and high-voltage power lines.

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To protect against damage and pollutants, the temperature probes must not be removed from their packaging until immediately before installation.

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Do not wind, bend, extend, or shorten the temperature probe lines.

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When connecting to a computer unit, always connect the temperature probe first before connecting the volume measuring unit.

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## Warning symbols



### **WARNING!**

#### **Risk of burns!**

The installation process must be carried out by trained personnel.

When using water additives (corrosion protection, etc.), the operator must make sure there is sufficient corrosion resistance before installing the temperature probe.

With direct mounting, the temperature probe is immersed in the pipeline without any additional immersion sleeve. During dismounting, always make sure that hot medium does not escape from the pipeline.

- ▶ Drain the pipeline system or seal off the temperature probe's installation location to relieve pressure.
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# 1 Safety information

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### 2.1 Object of these instructions and purpose of application

The standard DIN EN 1434 describes the requirements for heat meters and their sub-components. When combining sub-components (flow sensor, set of temperature probes, computer unit) to form a heat meter, the standard prescribes platinum RTD temperature probes according to the standard DIN EN 60751 because these probes have sufficient measurement stability, accuracy, and interchangeability.

These days, the latest heat meters use various nominal values on the computer unit side (resistance value at 0 °C). The nominal values are normally 100 Ω (Pt100), 500 Ω (Pt500) and 1000 Ω (Pt1000).

The RTD temperature probes from the type series 902427/10 and 902427/11 for direct mounting and 902437/10 for installation in immersion sleeves are type-tested according to the European Measuring Instruments Directive 2014/32/EU (MID) including Annexes I and MI-004. The paired temperature probes are suitable for being connected to a computer unit for a heat meter and measuring the difference between the inflow and outflow temperature in a heat exchanger system.

The temperature probes are made up of a corrosion-resistant protection fitting.

In order to meet the metrological requirements of the European Measuring Instruments Directive 2014/32/EU (MID) and the Annex MI-004, the temperature probes are calibrated at three temperatures and paired according to a special mathematical process in order to comply with the tolerances for temperature differences. The lower limit for temperature differences is 3 K.

### 2.2 Identification marking

Each temperature probe pair is equipped with a nameplate containing the following information:

- CE identification marking with ID codes for the notified bodies appointed to certify module D (production quality assurance)
- Metrology identification marking, including the two digits for the year in which the identification marking was created
- Logo for the owner of the type examination certificate
- Type examination certificate number
- Pair number/ID
- Manufacturing date (year/calendar week)
- Manufacturing location (in-house code)
- Type number
- Admissible measuring range (temperature, temperature difference)
- Maximum pressure stage
- Nominal value
- Manufacturer's address

The inflow and outflow probes are distinguished by colored identification markings on the temperature probe's cable (red: inflow, blue: outflow) or using an identification marking on the nameplate (V = inflow, R = outflow).

## 2 General information

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### 3 Technical data

Temperature range 902427/10 902427/11 902437/10	0 to 180 °C 0 to 180 °C 0 to 180 °C The maximum operating temperature of the immersion sleeves must be observed.
Protection type	IP65 (as delivered condition) It must be ensured that the dew point is not reached or the temperature falls below this.
Temperature difference Minimum Maximum	3 K 180 K
Maximum pressure 902427/10 902427/11 902437/10	PS25 for a water flow velocity of 2 m/s PS25 for a water flow velocity of 2 m/s With immersion sleeves basic type 902440/42, 902440/43 and 902440/44 PS40 for a water flow velocity of 2 m/s
Electrical connection	2-wire circuit, 4-wire circuit
Maximum measuring current	The maximum measuring current is calculated using the maximum admissible power loss of 5 mW. Depending on the nominal values, this results in the following effective current values: Pt100: 1783 µA Pt500: 797 µA Pt1000: 564 µA
Response times Temperature probe, direct measurement 902427/10 902427/11 Temperature probe, in immersion sleeve 902437/10	$t_{0,5} \leq 6 \text{ s}$ $t_{0,5} \leq 6 \text{ s}$ $t_{0,5} \leq 12 \text{ s}$ (installed in immersion sleeve)
Minimum immersion depth	30 mm
Nominal value	Pt100, Pt500, Pt1000 (see identification marking for temperature probe)
Tolerance	Class B according to DIN EN 60751; restricted tolerances optional When using two-wire technology, the system display will be higher due to the line resistance (see maximum connection length according to DIN EN 1434).

### 3 Technical data

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## 4 Installation

If the pair of temperature probes is connected to a computer unit, make sure that the probe's nominal value matches that of the processing computer unit.

Furthermore, make sure that the installation location is deep enough to prevent damage to the tip of the probe or immersion sleeve when screwing in.

The temperature probe must be installed in the pipeline so that a sufficient immersion depth is guaranteed that is greater than the minimum immersion depth in all cases.

During installation, the connection cable must not be shortened or extended as this would impair compliance with the tolerances (for two-wire technology).

To avoid an inductive effect, the connecting cable should not be wound.

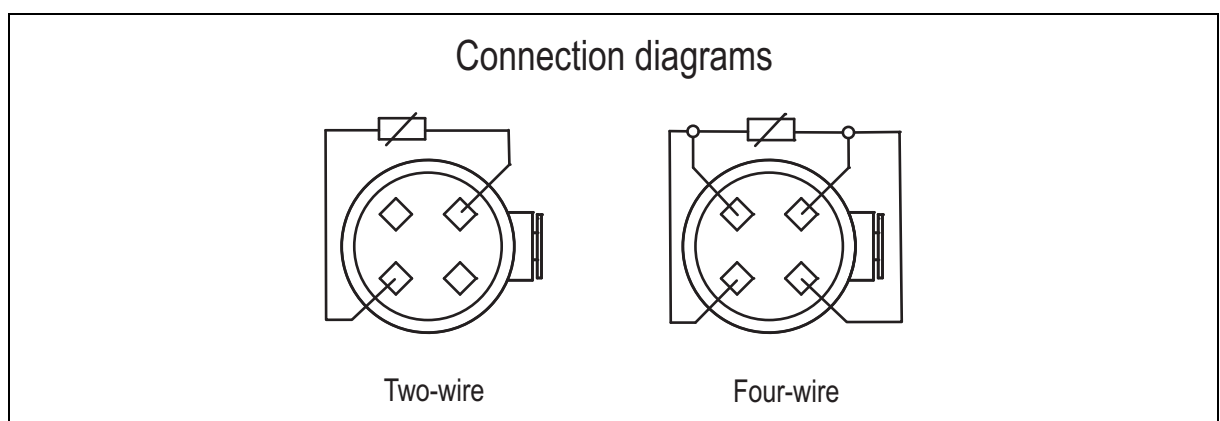
The connecting cable must not be laid alongside or wrapped around hot pipes because the line resistance and its temperature dependence are considered in the measurement result for temperature probes using two-wire technology.

Following successful mounting, the temperature probes must be secured against manipulation with a seal. For this, the seal holes in the fastening screw at the terminal head, or special sealing eyelets, are provided. The sealing set is available as part no. 00650727.

The maximum length for connecting cables in two-wire technology depends on the conductor cross section and the nominal value according to DIN EN 1434-2. If the maximum permissible length, which may be connected to the calculator, has a lower value, this value applies (to be taken from the type examination certificate).

Conductor cross section in mm <sup>2</sup>	Maximum length for Pt100 in m	Maximum length for Pt500 in m	Maximum length for Pt1000 in m
0.22	2.5	12.5	25.0
0.50	5.0	25.0	50.0
0.75	7.5	37.5	78.0
1.50	15.0	75.0	150.0

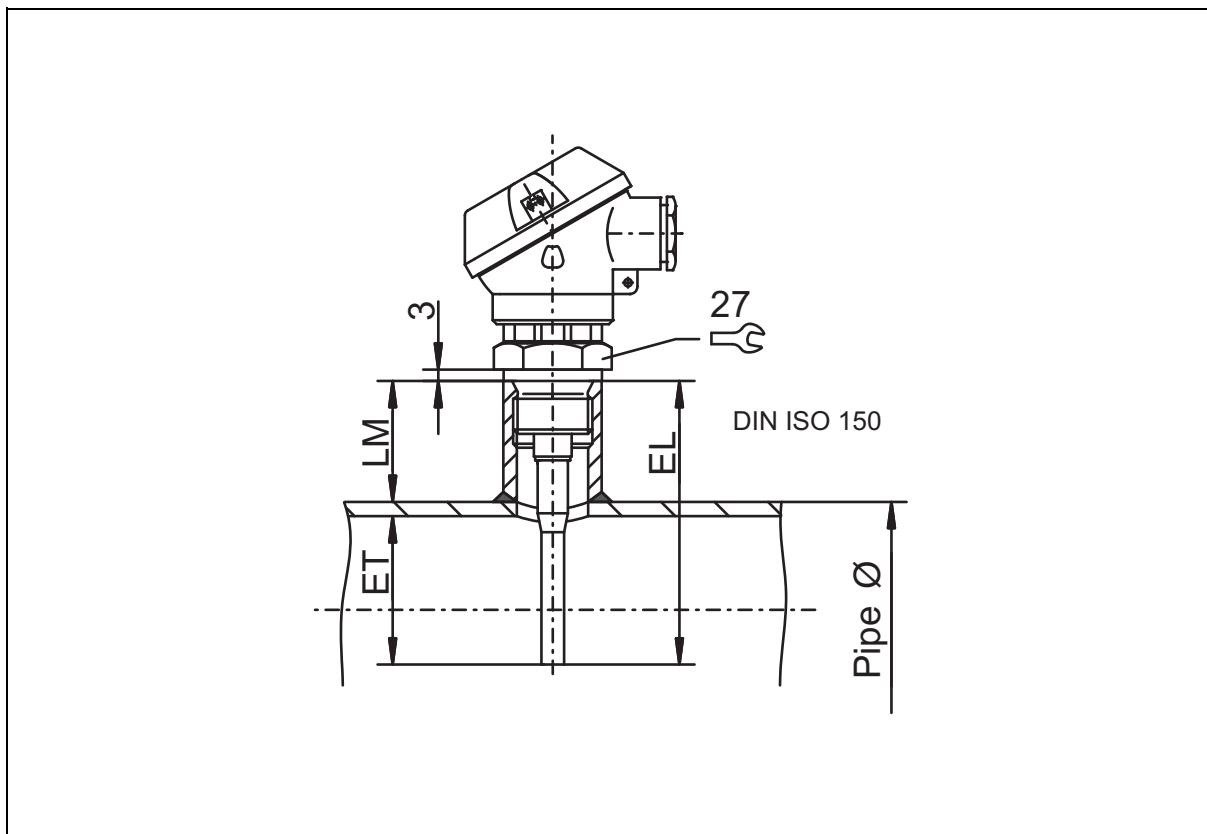
When choosing a connecting cable, make sure that the sheath material is sufficiently age resistant. The connecting cable's outer diameter should be chosen so that there can be a secure seal for the cable entry to the terminal head (terminal head shape J: outer diameter 4 to 9 mm; terminal head shape B: outer diameter 5 to 12.5 mm)



In order to reduce additional installation-related measurement errors to a minimum, the temperature probes in the flow and return must be installed the same. This applies to the pipe diameters and installation fittings used, and the choice of the same immersion depth, which must be greater than the minimum immersion depth, and the external thermal insulation. This is intended to ensure that the possible measurement deviations depending on the installation location are canceled out in the first approximation when determining the difference.

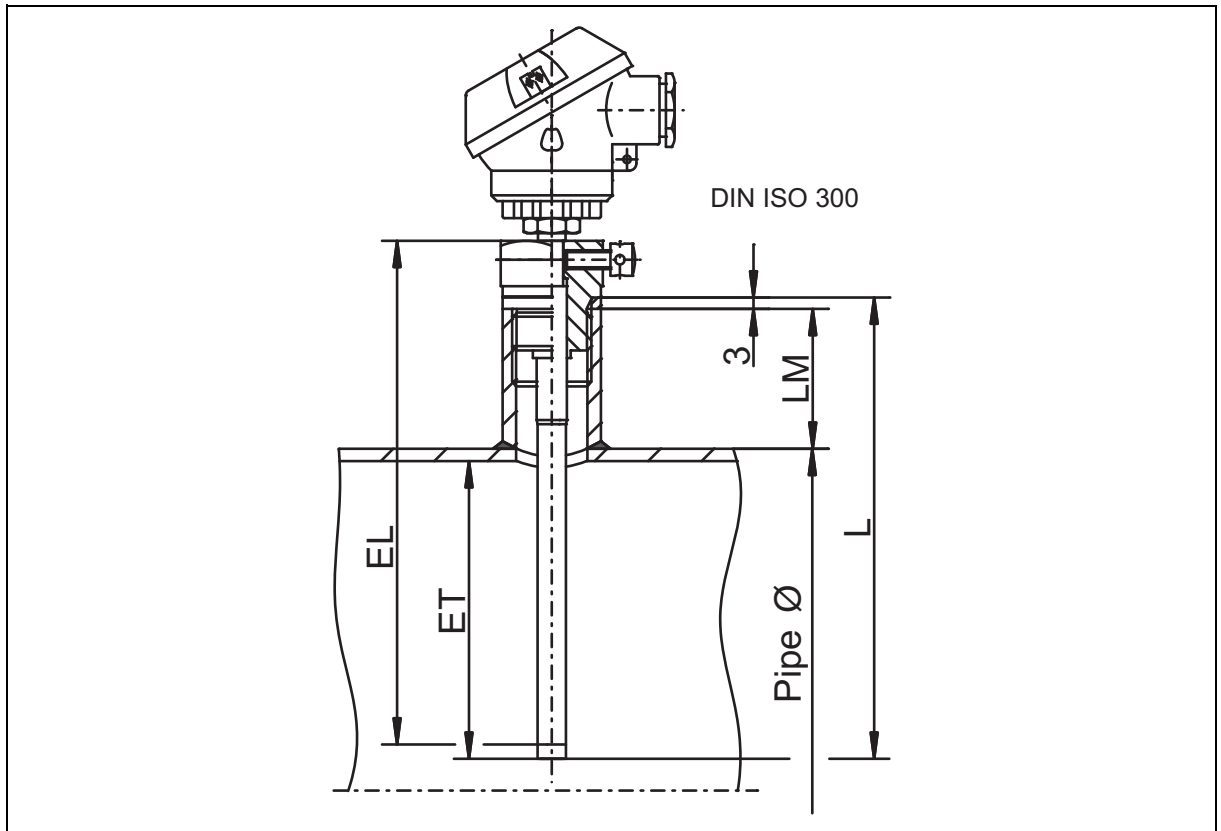
## 4 Installation

### 4.1 Temperature probes for direct mounting (902427/10 and 902427/11)



Direct mounting				
DN	Pipe Ø	EL	ET	LM
50 mm	60.3 mm	85 mm	-39 mm	40 mm
65 mm	76.1 mm	120 mm	-54 mm	60 mm
80 mm	88.9 mm	120 mm	-64 mm	50 mm
100 mm	114.3 mm	120 mm	-63 mm	50 mm
150 mm	168.3 mm	120 mm	-73 mm	40 mm

## 4.2 Temperature probes in immersion sleeves (902437/10)



**Installation in immersion sleeve**

DN	Pipe Ø	EL	ET	LM	L
150 mm	168.3 mm	140 mm	-73 mm	40 mm	120 mm
200 mm	219.1 mm	220 mm	-131 mm	70 mm	210 mm
250 mm	273.0 mm	220 mm	-131 mm	70 mm	210 mm
300 mm	323.9 mm	220 mm	-130 mm	70 mm	210 mm



**NOTE!**

We recommend an installation location in accordance with DIN EN 1434-2. Make sure that the seal and sealing surface in the installation location are undamaged, clean, and dry.

## 4 Installation

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### NOTE!

In order to maintain measurement stability, a measurement inspection must be carried out when the national calibration period has elapsed to check that the maximum permissible error (MPE) is observed.

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### NOTE!

When installing temperature probes in immersion sleeves, it must be ensured that the permissible degree of tolerance between the temperature probe's outer diameter and the internal diameter of the immersion sleeve is adhered to. The temperature probe's outer diameter is (6 -0.03/-0.14) mm.

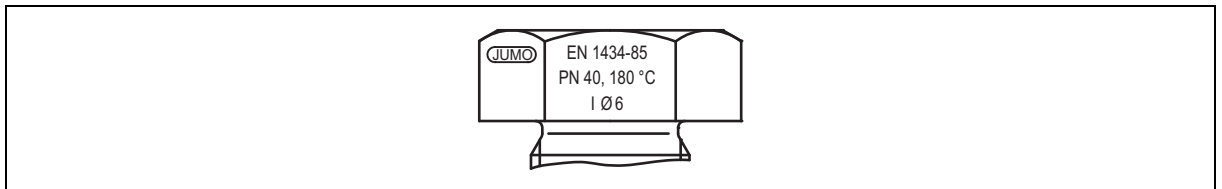
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There are two possible versions of immersion sleeve:

#### Version 1

Immersion sleeve internal diameter: (6 +0.08/-0.00) mm

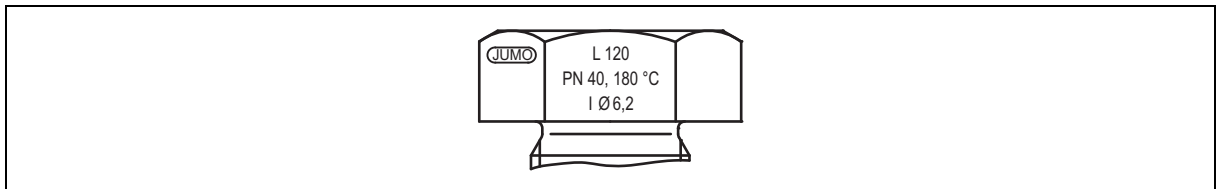
This version complies with the DIN EN 1434-2 standard and is preferred. The immersion sleeve is marked by an appropriate DIN EN 1434 standard reference and the installation length, as well as pressure rating, inside diameter, maximum service temperature, and JUMO company logo:



#### Version 2

Immersion sleeve internal diameter (6.2 +0.00/-0.05) mm

This version does not comply with specifications from standards, but has the right the metrological properties nonetheless. With regard to labeling, the DIN EN 1434 reference is omitted in contrast to version 1.



## 5 Maintenance

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In order to maintain measurement stability, the temperature probes must be replaced after the calibration period or metrology identification mark has expired.

## 5 Maintenance

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## EU-Konformitätserklärung

EU declaration of conformity / Déclaration UE de conformité

### Dokument-Nr.

CE 450

*Document No. / Document n°.*

### Hersteller

JUMO GmbH & Co. KG

*Manufacturer / Etabli par*

### Anschrift

Moritz-Juchheim-Straße 1, 36039 Fulda, Germany

*Address / Adresse*

### Produkt

*Product / Produit*

#### Name

*Name / Nom*

#### Typ

*Type / Type*

#### Typenblatt-Nr.

*Data sheet no. / N°*

*Document*

*d'identification*

JUMO HEATtemp - Screw-In RTD -

902427/10

902427

Types DL

JUMO HEATtemp - Screw-In RTD -

902427/11

902427

Types DL

JUMO HEATtemp - Screw-In RTD -

902427/12

902427

Types DL

JUMO HEATtemp - Push-In RTD -

902437/10

902437

Types PL

JUMO HEATtemp - Push-In RTD -

902437/12

902437

Types PL

### Wir erklären in alleiniger Verantwortung, dass das bezeichnete Produkt die Anforderungen der Europäischen Richtlinien erfüllt.

*We hereby declare in sole responsibility that the designated product fulfills the requirements of the European Directives.*

*Nous déclarons sous notre seule responsabilité que le produit remplit les Directives Européennes.*

Dokument-Nr.

CE 450

EU-Konformitätserklärung

Seite: 1 von 3

*Document No. / Document n°.*

# 6 Declaration of conformity

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### Richtlinie 1

*Directive / Directive*

#### Name

*Name / Nom*

MID

#### Fundstelle

*Reference / Référence*

2014/32/EU

#### Bemerkung

*Comment / Remarque*

Mod. B+D

#### Datum der Erstanbringung des CE-Zeichens auf dem Produkt

*Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit*

2008

### Gültig für Typ

*Valid for Type / Valable pour le type*

902427/10

902427/11

902427/12

902437/10

902437/12

### EU-Baumusterprüfbescheinigung 1.1

*EU type examination certificate / Certificat d'examen de type UE*

#### Fundstelle

*Reference / Référence*

DE-06-MI004-PTB015

#### Benannte Stelle

*Notified Body / Organisme notifié*

Physikalisch-Technische-Bundesanstalt (PTB)

#### Kennnummer

*Identification no. / N° d'identification*

0102

### Angewendete Normen/Spezifikationen

*Standards/Specifications applied / Normes/Spécifications appliquées*

#### Fundstelle

*Reference / Référence*

#### Ausgabe

*Edition / Édition*

#### Bemerkung

*Comment / Remarque*

EN 1434-1

2015

EN 1434-2

2015

EN 1434-4

2015

EN 1434-5

2015

EN 60751

2008

Dokument-Nr.

CE 450

EU-Konformitätserklärung

Seite: 2 von 3

Document No. / Document n°.

# 6 Declaration of conformity

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## Anerkannte Qualitätssicherungssysteme der Produktion

*Recognized quality assurance systems of production / Systèmes de qualité reconnus de production*

### Benannte Stelle

*Notified Body / Organisme notifié*

Physikalisch-Technische-Bundesanstalt (PTB)

### Kennnummer

*Identification no. / N° d'identification*

0102

## Allgemeine Bemerkungen

*General remarks / Observations générales*

Annex II Module D of Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on measuring instruments (ABl. EG Nr. L 180)

Physikalisch-Technische Bundesanstalt Braunschweig, Body No.: 0102

Conformity assessment body, Assessment of QM-Systems of manufacturers of measuring instruments

Certificate No.: DE-M-AQ-PTB002

## Aussteller

*Issued by / Etabli par*

JUMO GmbH & Co. KG

## Ort, Datum

*Place, date / Lieu, date*

Fulda, 2018-11-26

## Rechtsverbindliche Unterschriften

*Legally binding signatures /*

*Signatures juridiquement valable*

Bereichsleiter Vertrieb Inland / Globales  
Produkt- und Branchenmanagement  
ppa. Dimitrios Charisiadis

Qualitätsbeauftragter und Leiter Qualitätswesen  
i. V. Harald Gienger

Dokument-Nr.

Document No. / Document n°.



CE 450

EU-Konformitätserklärung



Seite: 3 von 3

## 6 Declaration of conformity

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	 More than <span style="background-color: #f96;">sensors</span> + <span style="background-color: #92d050;">automation</span>					
产品组别 Product group: 902427	<b>产品中有害物质的名称及含量</b> <b>China EEP Hazardous Substances Information</b>					
部件名称 Component Name						
	铅 ( Pb )	汞 ( Hg )	镉 ( Cd )	六价铬 ( Cr(VI) )	多溴联苯 ( PBB )	多溴二苯醚 ( PBDE )
外壳 Housing (Gehäuse)	X	○	○	○	○	○
过程连接 Process connection (Prozessanschluss)	○	○	○	○	○	○
螺母 Nuts (Mutter)	○	○	○	○	○	○
螺栓 Screw (Schraube)	X	○	○	○	○	○
<p>本表格依据SJ/T 11364的规定编制。 This table is prepared in accordance with the provisions SJ/T 11364.</p> <p>○：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。 Indicate the hazardous substances in all homogeneous materials' for the part is below the limit of the GB/T 26572.</p> <p>×：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。 Indicate the hazardous substances in at least one homogeneous materials' of the part is exceeded the limit of the GB/T 26572.</p>						

# 7 China RoHS

	 <small>More than sensors + automation</small>					
产品组别 Product group: 902437	<b>产品中有害物质的名称及含量</b> <b>China EEP Hazardous Substances Information</b>					
部件名称 Component Name						
	铅 ( Pb )	汞 ( Hg )	镉 ( Cd )	六价铬 ( Cr(VI) )	多溴联苯 ( PBB )	多溴二苯醚 ( PBDE )
外壳 Housing (Gehäuse)	X	○	○	○	○	○
过程连接 Process connection (Prozessanschluss)	○	○	○	○	○	○
螺母 Nuts (Mutter)	○	○	○	○	○	○
螺栓 Screw (Schraube)	X	○	○	○	○	○
本表格依据SJ/T 11364的规定编制。 This table is prepared in accordance with the provisions SJ/T 11364. ○ : 表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。 Indicate the hazardous substances in all homogeneous materials' for the part is below the limit of the GB/T 26572.  × : 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。 Indicate the hazardous substances in at least one homogeneous materials' of the part is exceeded the limit of the GB/T 26572.						





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