Temperature Probes

for Thermal Energy Measuring Devices

Basic type 902455/20

Basic types 902455/70 and 902455/71

Operating Manual

90245520T90Z001K000

V2.00/EN/00713471/2024-01-24

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1 Safety information

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!

Warning symbols

WARNING!

This symbol in connection with the signal word indicates that **personal injury** may occur if the respective precautionary measures are not carried out.

READ THE DOCUMENTATION!

This symbol, which is attached to the device, indicates that the associated **documentation for the device** must be **observed**. This is necessary to identify the nature of the potential hazard, and to take measures to prevent it.

Note symbols

NOTE!

This symbol refers to **important information** about the product, its handling, or additional benefits.

DISPOSAL!

At the end of its service life, the device and any batteries present do not belong in the trash! Please ensure that they are **disposed of** properly and in an **environmentally friendly** manner.

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
- TR-K7.1, TR-K7.2, TR-K8 and TR-K9
- German Weights and Measures Act (MessEG)
- German Weights and Measures Directive (MessEV)

Specifications for electrical installations must be observed.

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

All notes listed in the installation instructions must be observed.

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

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.

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

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

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

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.

2 General information

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, pair 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 902455/20, 902455/70 and 902455/71 for direct mounting are type-tested according to the European Measuring Instruments Directive 2014/32/EU (MID) including Annexes I and MI-004 as well as Annex 4 Module D of the German Weights and Measures Act (Mess- und Eichverordnung). The paired temperature probes are suitable for being connected to a computer unit of a heat meter and measure the difference between the inflow and outflow temperature of a heat exchanger system.

The temperature probes are made up of a corrosion-resistant protection fitting. The connecting cable is permanently connected to the temperature probe.

In order to meet the metrological requirements of the European Measuring Instruments Directive 2014/32/EU (MID) and the Annex MI-004 as well as the German Weights and Measures Act (Mess- und Eichverordnung) and Annex 4 Module D, the temperature probes are calibrated at three temperatures and paired according to a special mathematical process in order to comply with the tolerance for the temperature difference. The lower limit for the temperature difference 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).

Temperature range	
902455/20	0 to 150 °C
902455/70 and 902455/71	0 to 150 °C
Protection type	IP65 (as delivered condition) In heat applications, it must be ensured that the dew point is not reached or undershot.
Temperature difference	
Minimum	
902455/20	3 K
902455/70 and 902455/71	3 K
Maximum	
902455/20	85 K
902455/70 and 902455/71	85 K
Maximum pressure	PS25 for a water flow velocity of 2 m/s
Electrical connection	Two-wire, four-wire
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	
902455/20	$t_{0.5} \leq 2.0$ s; $t_{0.9} \leq 5.0$ s
902455/70	$t_{0.5} \leq 2.0$ s; $t_{0.9} \leq 5.0$ s
902455/71	$t_{0.5} \leq 1.1$ s; $t_{0.9} \leq 3.5$ s
Minimum immersion depth	15 mm
Nominal value	Pt100, Pt500, Pt1000 (see identification marking for temperature probes)
Tolerance	Class B according to DIN EN 60751; restricted tolerances optional When using two-wire technology, the display will be systematically higher due to the line resistance (see maximum connection length according to DIN EN 1434).

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 when screwing in.

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

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

To prevent 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. The sealing hole in the fastening screw or nameplate is intended for this purpose. The sealing set is available as part no. 00650727.

The installation point of the inflow and outflow probes must be identical (symmetrical installation), unless the non-symmetrical installation is approved by the meter manufacturer.

NOTE!

The following specifications apply for Germany according to the technical directives TR-K8 and TR-K9: For heat/cold meters with nominal flow rates less than or equal to qp 6 m^3/h, the temperature probe must only be installed with direct immersion when installing the section of the pipeline in the measuring point area with nominal pressures less than or equal to 16 bar.

NOTE!

The minimum immersion depth for the temperature probes is 15 mm.

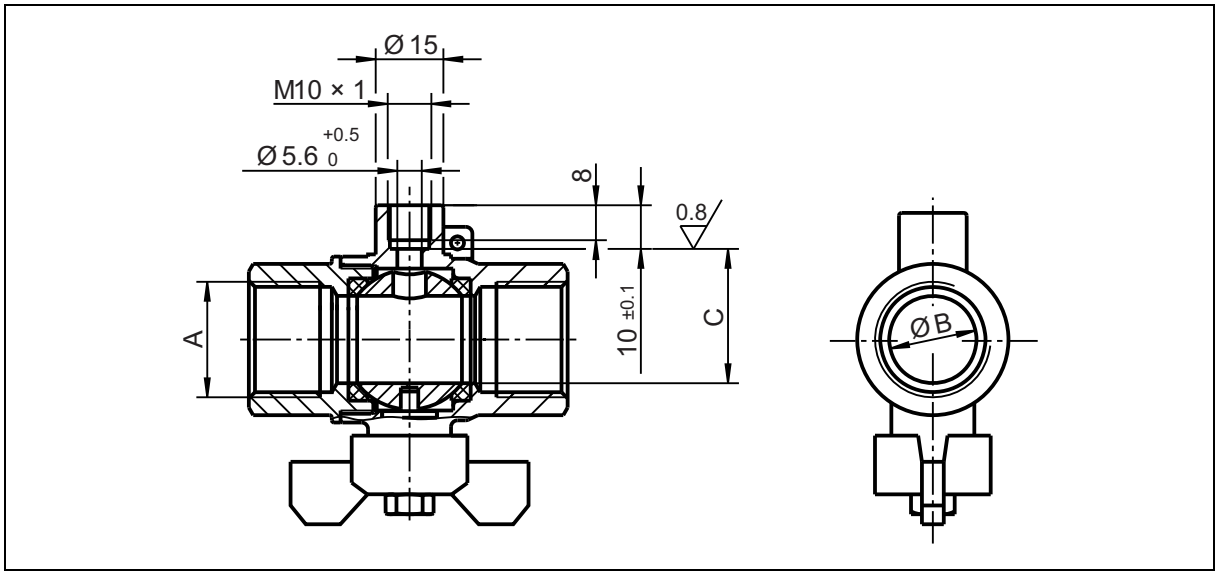
NOTE!

Recommended tightening torques 6 to 10 Nm (in installation locations according to DIN EN 1434-2:2022).

NOTE!

The dimensions specified only apply to ball valves of JUMO GmbH & Co. KG.

The installation locations must be implemented according to the DIN EN 1434-2:2022 standard (see the figure below). The mounting must be implemented according to the mounting specifications. Make sure that the seal and sealing surface in the installation location are undamaged, clean, and dry.



Thread A	Diameter B	Length C	Recommended temperature sensor
G 1/2 B	15 mm	29 mm	direct, short, 27.5 mm
G 3/4 B	19 mm	31 mm	direct, short, 27.5 mm
G 1 B	25 mm	36 mm	direct, short, 27.5 mm
G 1 1/4 B	32 mm	46 mm	direct, short, 38 mm
G 1 1/2 B	40 mm	55 mm	direct, short, 38 mm
G 2 B	49 mm	65.4 mm	direct, short, 60 mm

5 Maintenance

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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Konformitätserklärung

Dokument Nr.:	DE-017	
Hersteller:	JUMO GmbH & Co. KG	
Anschrift:	Moritz-Juchheim-Straße 1, 36039 Fulda, Germany	
Produkt :	Beschreibung	Temperaturfühler für Kältezähler
	Typ/ Serie	902455/20; 902455/21; 902455/50; 902455/51; 902455//70; 902455/71; 902465/50; 902465/51
	Typenblatt-Nr.	902455; 902465

Der Hersteller bestätigt, dass der oben beschriebene Gegenstand der Erklärung das Mess- und Eichgesetz und die darauf gestützten Rechtsverordnungen einhält.

Angewandte Gesetze:

MessEG	[Mess- und Eichgesetz]	Ausgabe: 2013

Angewendete Normen:

DIN EN 1434-1	Ausgabe: 2019
DIN EN 1434-2	Ausgabe: 2019
DIN EN 1434-4	Ausgabe: 2019
DIN EN 1434-5	Ausgabe: 2019
DIN EN 60751	Ausgabe: 2009

Angewendete Regelwerke:

Ermittelter Regeln und Erkenntnisse des Regelermittlungsausschusses nach § 46 des Mess- und Eichgesetzes — Ausgabe: 2022

Baumusterprüfbescheinigung (Bauartzulassung):

DE-15-M-PTB-0052 — Aussteller: PTB Berlin

Anerkannte Qualitätssicherungssysteme der Produktion:

Anlage 4 Teil B Modul D der Mess- und Eichverordnung vom 11.12.2014 (BGBl. I S. 2010), Abs. 3.2 u. 3.3
Physikalisch Technische-Bundesanstalt Braunschweig, Nr. der Stelle: 0102
Konformitätsbewertungsstelle – QM-Systembewertungen von Messgeräteherstellern
Zertifikatsnummer: DE-M-AQ-PTB002

Aussteller

Ort, Datum: Fulda, 2022-11-11

Firma
JUMO GmbH & Co. KG, Fulda

Fulda, 2022-11-11

Rechtsverbindliche Unterschriften:

BL Globaler Vertrieb
Markus Belmer

ppa.

Qualitätsbeauftragter und Leiter Qualitätswesen
i. V. Harald Gienger

i. V.

Dokument-Nr. DE-017 — Konformitätserklärung — Seite 1 von 1

7 China RoHS

						
产品组别 Product group: 902455	产品中有害物质的名称及含量 China EEP Hazardous Substances Information					
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)	○	○	○	○	○	○
过程连接 Process connection (Prozessanschluss)	X	○	○	○	○	○
螺母 Nuts (Mutter)	○	○	○	○	○	○
螺栓 Screw (Schraube)	○	○	○	○	○	○

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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