Temperature probe for heat meters

Basic types 902428/50 and 902438/50



Instruction Manual

JUMO

90242850T90Z001K000

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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!

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 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.

2.1 Object of these instructions and purpose of application

The standard DIN EN 1434 describes the requirements for heat meters and their 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 temperature 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 902428/50 for direct mounting and 902438/50 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 probe is made up of a corrosion-resistant process connection. The connecting cable is connected to the temperature probe so that it cannot be disconnected.

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).

3 Technical data

Temperature range	
902428/50	0 to 150 °C
902438/50	0 to 150 °C The maximum operating temperature of the immersion sleeves must be observed.
Protection type	IP65 (as delivered condition) Measures must be taken to ensure the dew point is not reached in heat applications.
Temperature difference	
Minimum	3 K
Maximum	150 K
Maximum pressure	
902428/50	PS25 for a water flow velocity of 2 m/s
902438/50	With immersion sleeves according to 90.279-F05, sheet 3, 4, 5, and 6 PS25 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	
902428/50	
Diameter 5.0 mm	$t_{0.5} \leq 3.5$ s; $t_{0.9} \leq 10.5$ s
Diameter 6.0 mm	$t_{0.5} \leq 5.0$ s; $t_{0.9} \leq 11.5$ s
Temperature probe, in immersion sleeve	
902438/50	
Diameter 5.0 mm	$t_{0.5} \leq 7.0$ s; $t_{0.9} \leq 27.0$ s
Diameter 6.0 mm	$t_{0.5} \leq 5.0$ s; $t_{0.9} \leq 11.5$ s
Measurement stability	10 years (see also maintenance)
Minimum immersion depth	15 mm at maximum temperature up to 105 °C 20 mm at maximum temperature up to 150 °C
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).

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).

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 thermometers using two-wire technology.

Following successful mounting, the temperature probes must be secured against manipulation with a seal. The sealing hole in the attachment screw or nameplate is intended for this purpose. The sealing set is available as part no. 00650727.

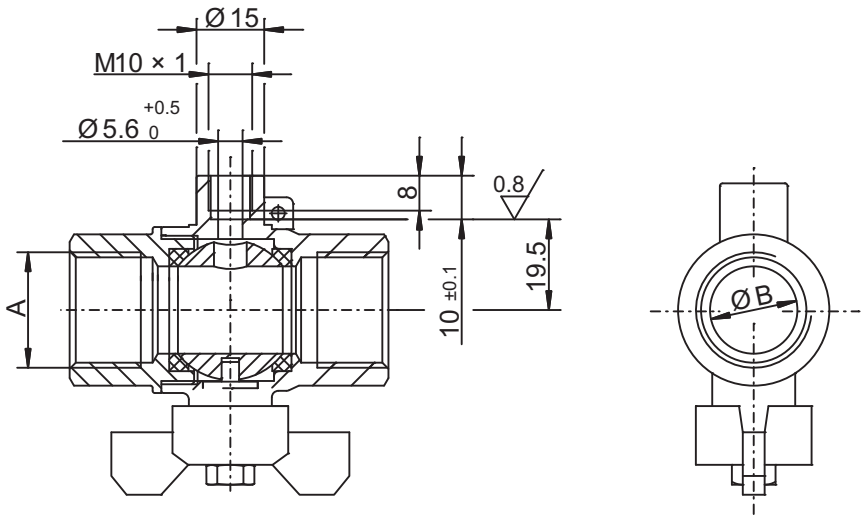
NOTE!

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 lower than or equal to 16 bar. Tolerances apply for existing immersion sleeves.

4 Installation

4.1 Temperature probes for direct mounting (902428/50)

If the temperature probes are installed directly, the installation locations must be designed according to the DIN EN 1434-2:2015 standard (see the figure below). The components must be mounted according to the mounting specifications. Make sure that the seal and sealing surface in the installation location are undamaged, clean, and dry.



Thread size A	Inner diameter B
G 1/2 B	18.5 mm
G 3/4 B	24 mm
G 1 B	30.5 mm
G 1 1/4 B	39 mm
G 1 1/2 B	45 mm

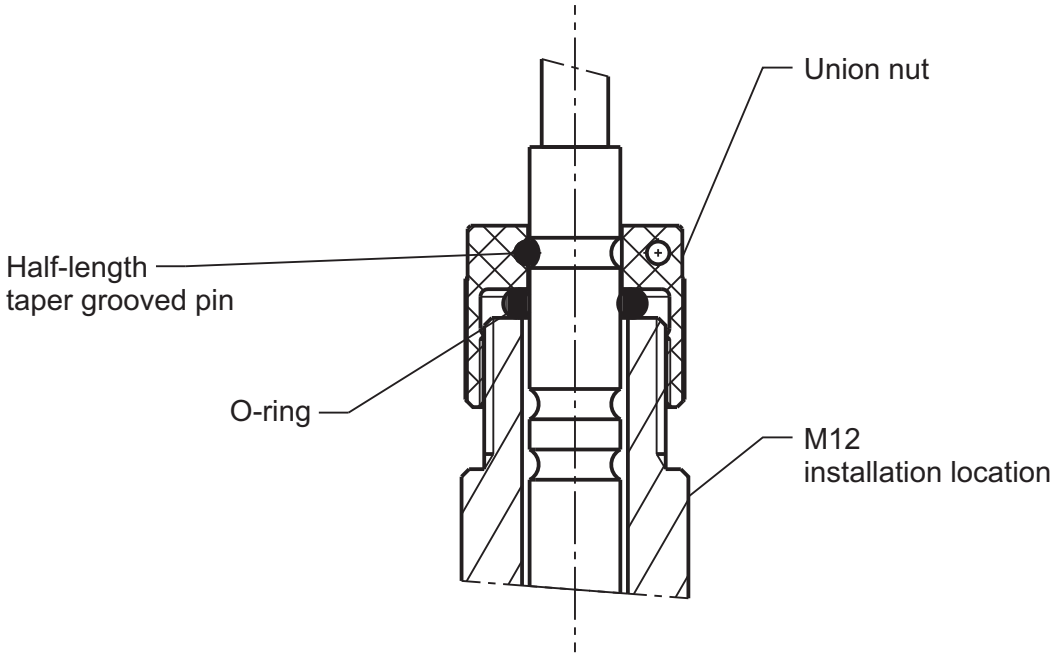
NOTE!

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

NOTE!

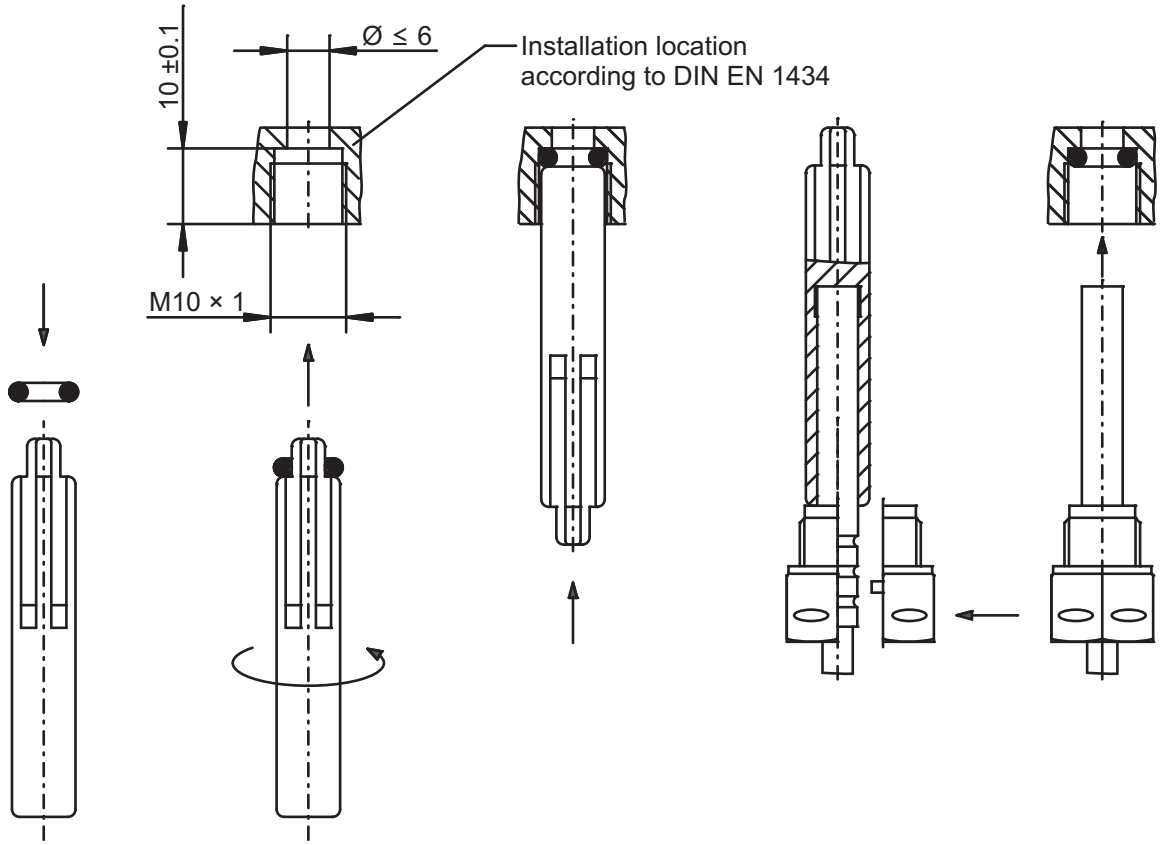
Only temperature probes with diameters of 5.0 mm or 5.2 mm are admissible for direct mounting in ball valves with an M10 internal thread.

4.2 Temperature probes for direct mounting with M12 union nut (902428/50)



1. Using the half-length taper grooved pin, mount the union nut into the last groove of the temperature probe sleeve.
2. Slide the O-ring onto the free space between the last and middle groove.
3. Screw the temperature probe with union nut into the M12 installation location (tightening torque of 6 to 10 Nm).

4 Installation



1. Remove the plug and seal or the old probe and o-ring so that no residue is left behind.
2. Place the o-ring from the supplied mounting set onto the assembly aid.
3. Insert the o-ring with the assembly aid into the installation location according to DIN EN 1434 using a rotating motion.
4. Position the o-ring in the final installation location using the other end of the assembly aid.
5. Pull the end of the assembly aid over the temperature probe sleeve - up to the limit stop in the temperature probe sleeve (to determine the probe installation length).
   Grasp the two halves of the black plastic screw directly above the assembly aid and press into the recesses (beads) on the temperature probe sleeve.
   Remove the assembly aid from the temperature probe.
   Press both halves of the screw connection firmly together.
6. Press the temperature probe with the black plastic quick-release screw into the installation location and screw it in to the limit stop so that it is hand-tight (tightening torque of 3 to 5 Nm).
7. Check that there is no leakage and seal the temperature probe.

NOTE!

A new o-ring must be used after each dismounting process.

4.3 Temperature probes in short immersion sleeves (902438/50)

If the temperature probe is installed in a short immersion sleeve, the installation specification 90.279-F50-3MV must be observed. Before fixing the temperature probe in the short immersion sleeve, always check that the temperature probe is inserted all the way into the short immersion sleeve and is in contact with the base.

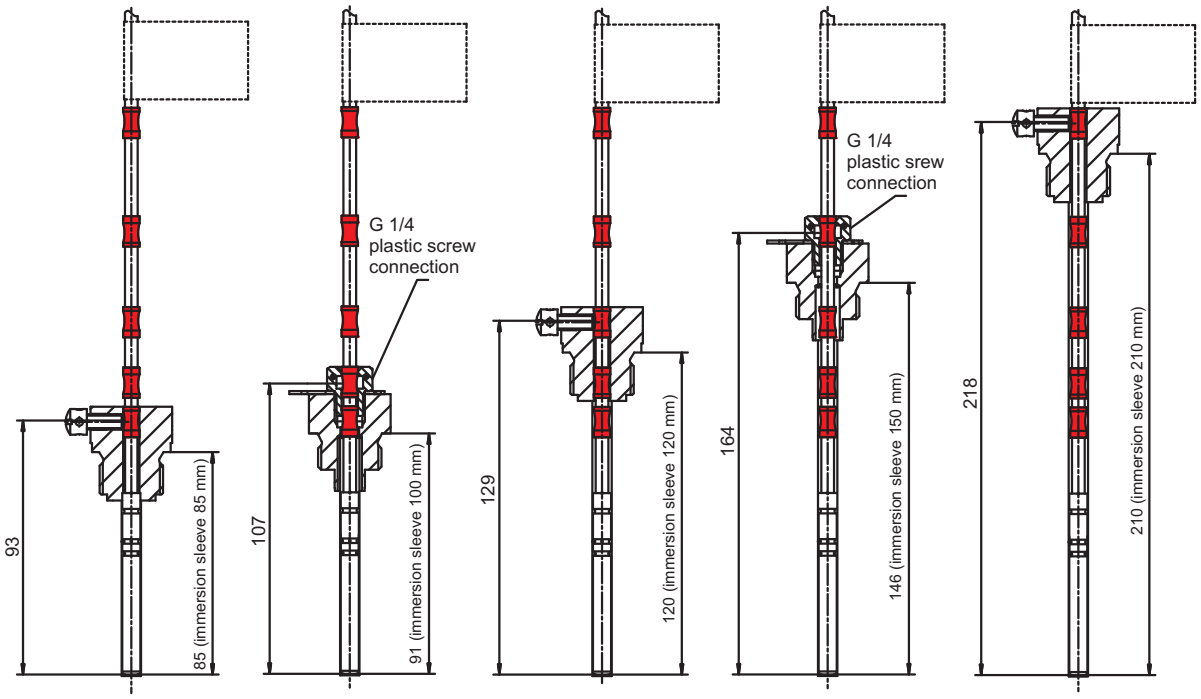
4.4 Temperature probes in long immersion sleeves (902438/50)

If necessary, the temperature probes can also be designed for installation in long immersion sleeves. In this version, cable clamping sleeves are located on the cable. Before mounting, check that the correct cable clamping sleeves are being used by measuring the immersion sleeve length.

NOTE!

The number of cable clamping sleeves on the cable may vary.

The temperature probe is fixed in the basic type 902440/43 immersion sleeve using a lateral sealing screw on the cable clamping sleeve. For the basic type 902440/45 immersion sleeve, the temperature probe is fixed using a G 1/4 plastic screw connection.



immersion sleeve 902440/43 | immersion sleeve 902440/45 | immersion sleeve 902440/43 | immersion sleeve 902440/45 | immersion sleeve 902440/43

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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EU-Konformitätserklärung

EU declaration of conformity / Déclaration UE de conformité

Dokument-Nr. *Document No. / Document n°.*	CE 433
Hersteller *Manufacturer / Etabli par*	JUMO GmbH & Co. KG
Anschrift *Address / Adresse*	Moritz-Juchheim-Straße 1, 36039 Fulda, Germany

Produkt
Product / Produit

Name *Name / Nom*	**Typ** *Type / Type*	**Typenblatt-Nr.** *Data sheet no. / N° Document d'identification*
JUMO HEATtemp - RTD - Types DS and PS	902428/50	902428
JUMO HEATtemp - RTD - Types DS and PS	902438/50	902438

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 déclare sous notre seule responsabilité que le produit remplit les Directives Européennes.

6 Declaration of conformity

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1. Richtlinie
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*	2007

Gültig für Typ
Valid for Type / Valable pour le type

902428/50

902438/50

1.1 EU-Baumusterprüfbescheinigung
EU type examination certificate / Certificat d'examen de type UE

Fundstelle *Reference / Référence*	A 0445/2112/2007
Notifizierte Stelle *Notified Body / Organisme notifié*	Bundesamt für Eich- und Vermessungswesen (BEV)
Kennnummer *Identification no. / N° d'identification*	0445

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Angewendete Normen/Spezifikationen

Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 1434-1	2015+A1:2018	The edition 2007 is meet for presumtion of conformity
EN 1434-2	2015+A1:2018	The edition 2007 is meet for presumtion of conformity
EN 1434-4	2015+A1:2018	The edition 2007 is meet for presumtion of conformity
EN 1434-5	2015+A1:2019	The edition 2007 is meet for presumtion of conformity
EN 60751	2008	
OIML R75-2	2002	

Anerkannte Qualitätssicherungssysteme der Produktion

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

Notifizierte Stelle *Notified Body / Organisme notifié*	**Kennnummer** *Identification no. / N° d'identification*
Physikalisch-Technische-Bundesanstalt (PTB)	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

6 Declaration of conformity

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Aussteller *Issued by / Etabli par*	JUMO GmbH & Co. KG
Ort, Datum *Place, date / Lieu, date*	Fulda, 2020-01-21
Rechtsverbindliche Unterschriften *Legally binding signatures /* *Signatures juridiquement valable*	Bereichsleiter Globaler Vertrieb ppa. Reiner Riedl Qualitätsbeauftragter und Leiter Qualitätswesen i. V. Harald Gienger



产品组别 Product group: 902428	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.

7 China RoHS

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