

ISO 9001  
ISO14001



Manufacturer

**TLV** CO., LTD.

Kakogawa, Japan

Is approved by LRQA Ltd. to ISO 9001:14001



# Instruction Manual

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**RTD Temperature Sensor**

Featured Model: TR1-35S

172-65585M-03

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# Introduction

Thank you for purchasing the TLV temperature sensor.

This product has been thoroughly inspected before being shipped from the factory. When the product is delivered, before doing anything else, check the specifications and external appearance to make sure nothing is out of the ordinary. Also be sure to read this manual carefully before use and follow the instructions to be sure of using the product properly.

If detailed instructions for special order specifications or options not contained in this manual are required, please contact TLV for full details.

This instruction manual is intended for use with the model(s) listed on the front cover. It is necessary not only for installation, but for subsequent maintenance, disassembly/reassembly and troubleshooting. Please keep it in a safe place for future reference.

# Safety Considerations

- Read this section carefully before use and be sure to follow the instructions.
- Installation, inspection, maintenance, repairs, disassembly, adjustment and valve opening/closing should be carried out only by trained maintenance personnel.
- The precautions listed in this manual are designed to ensure safety and prevent equipment damage and personal injury. For situations that may occur as a result of erroneous handling, three different types of cautionary items are used to indicate the degree of urgency and the scale of potential damage and danger: DANGER, WARNING and CAUTION.
- The three types of cautionary items above are very important for safety: be sure to observe all of them as they relate to installation, use, maintenance and repair. Furthermore, TLV accepts no responsibility for any accidents or damage occurring as a result of failure to observe these precautions.

## Cautionary items and definitions



### Danger

Indicates an urgent situation which poses a threat of death or serious injury



### Warning

Indicates that there is a potential threat of death or serious injury



### Caution

Indicates that there is a possibility of injury or equipment/product damage

## Safety Considerations for the Product



### Warning

**Install an appropriate protective device externally when there is a possibility that a malfunction or abnormality of this product may lead to a serious accident in the system.**

**In order to prevent equipment failure and protect against electric shock, do not turn on the power of the receiving instrument for the sensor until all wiring is complete.**

**DO NOT disassemble, repair or modify the product.** It may cause a malfunction of the product.



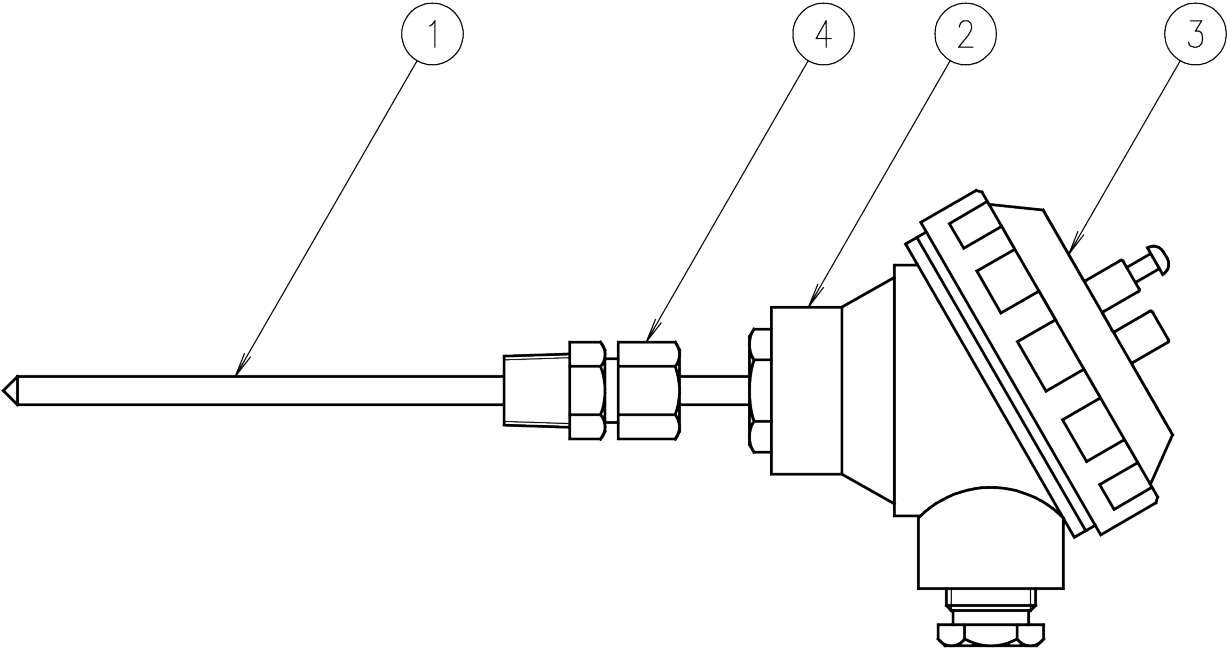
### Caution

**Do not use the product for any other purposes than temperature measurement.**

**Do not use the product for medical equipment with potentially fatal consequences.** The product is designed for use with industrial machinery, machine tools, and measuring equipment.

**Make sure to observe the precautions listed in this manual.** Failure to do so may lead to serious injuries or accidents.

# Configuration



No.	Part Name	No.	Part Name
1	Temperature Sensing Unit	3	Terminal Box
2	Product Label	4	Compression Fitting <sup>01</sup>

<sup>01</sup>Standard connection is shown.

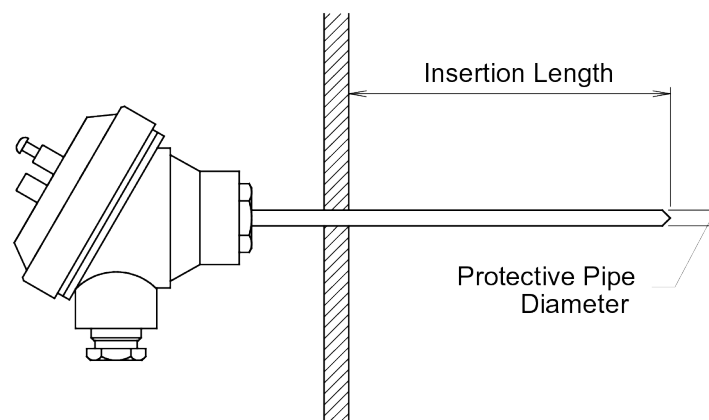
# Insertion Length

Accurate temperature cannot be measured unless the RTD element does not become an identical temperature to the measured object.

Make sure the insertion length of the protective pipe has sufficient length. Insertion length may vary depending on the fluid to be measured, a guideline is as follows.

## Standard insertion length for resistance temperature detector

Applicable Fluids	Insertion Length
Water	More than 10 times of the protective piping diameter
Air, Steam	More than 20 times of the protective piping diameter



# Wiring

In order to avoid the influence of induction noise, the product should be as far away as possible from the power line of the instrument, power supply lines, and load lines.

Verify the polarity when connecting the product and the wire or the connector and the instrument. Incorrect polarities will result in large measured value discrepancies.

When connecting the product to a terminal box, connector, etc., pay special attention as there is a possibility of electrical contact failure due to insufficient tightening and short circuit due to burrs on the wire.

Make sure to use heat resistant wire. If wire comes into contact with or is extremely close to the heat source, there is a possibility of poor insulation, short circuit, disconnection, etc.

When connecting the product to the receiving device, make sure to connect to the specified sensor input terminal. When connecting the product to a power source, it will become hot, which may lead to burns, fire or explosion.

Do not install the product where there is a high-voltage power supply nearby or a risk of high voltage leakage to the product.

# Handling

Do not touch the product right after it is used at high/low temperatures until its temperature is back to normal temperature as it may cause burns or cold burns.

Avoid rapid heating/cooling as the product may be damaged caused by heat shock.

After installing the product, make sure that the sensor is measuring the temperature properly.

When installing or removing the nipple or the temperature sensor with compression fitting, do not hold any other parts (terminal box, connector, sleeve, etc.) than the fixing. Loosening the terminal box or connector may cause disconnection, connection failure, or short circuit.

Do not pull or apply excessive force to the terminal box. Furthermore, do not turn the temperature sensor by holding the terminal box when installing or removing the product, as this may result in damage or cable disconnection.

The sheath protection tube has a maximum bend radius of 5 times the protection tube's outer diameter, however do not bend it repeatedly, as this may cause damage. (Sheath protective tube with a bend radius of 3 times the protection tube's outer diameter also available.) Do not bend the protective pipe within 100 mm from the tip as the resistant element is built in it.



# Maintenance

Maintenance should be carried out periodically by understanding the damage state of the protective pipe, removing soot, dust, sludge deposits, etc., tightening the screw of the connection portion, removing water droplets, condensation, confirming the insulation resistance (except for the ground type), and conservation of the environment, etc. Also, make sure to check the accuracy regularly.

## Disposal

When disposing of the product, classify it as industrial waste. When the product cannot be disposed of within the facility where the product is used, outsource disposal to an authorized industrial waste management company.

# TLV EXPRESS LIMITED WARRANTY

Subject to the limitations set forth below, TLV CO., LTD., a Japanese corporation ("**TLV**"), warrants that products which are sold by it, TLV International Inc. ("**TII**") or one of its group companies excluding TLV Corporation (a corporation of the United States of America), (hereinafter the "**Products**") are designed and manufactured by TLV, conform to the specifications published by TLV for the corresponding part numbers (the "**Specifications**") and are free from defective workmanship and materials. The party from whom the Products were purchased shall be known hereinafter as the "**Seller**". With regard to products or components manufactured by unrelated third parties (the "**Components**"), TLV provides no warranty other than the warranty from the third party manufacturer(s), if any.

## Exceptions to Warranty

This warranty does not cover defects or failures caused by:

1. improper shipping, installation, use, handling, etc., by persons other than TLV, TII or TLV group company personnel, or service representatives authorized by TLV; or
2. dirt, scale or rust, etc.; or
3. improper disassembly and reassembly, or inadequate inspection and maintenance by persons other than TLV or TLV group company personnel, or service representatives authorized by TLV; or
4. disasters or forces of nature or Acts of God; or
5. abuse, abnormal use, accidents or any other cause beyond the control of TLV, TII or TLV group companies; or
6. improper storage, maintenance or repair; or
7. operation of the Products not in accordance with instructions issued with the Products or with accepted industry practices; or
8. use for a purpose or in a manner for which the Products were not intended; or
9. use of the Products in a manner inconsistent with the Specifications; or
10. use of the Products with Hazardous Fluids (fluids other than steam, air, water, nitrogen, carbon dioxide and inert gases (helium, neon, argon, krypton, xenon and radon)); or
11. failure to follow the instructions contained in the TLV Instruction Manual for the Product.

## Duration of Warranty

This warranty is effective for a period of one (1) year after delivery of Products to the first end user. Notwithstanding the foregoing, asserting a claim under this warranty must be brought within three (3) years after the date of delivery to the initial buyer if not sold initially to the first end user.

ANY IMPLIED WARRANTIES NOT NEGATED HEREBY WHICH MAY ARISE BY OPERATION OF LAW, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ANY EXPRESS WARRANTIES NOT NEGATED HEREBY, ARE GIVEN SOLELY TO THE INITIAL BUYER AND ARE LIMITED IN DURATION TO ONE (1) YEAR FROM THE DATE OF SHIPMENT BY THE SELLER.

## Exclusive Remedy

THE EXCLUSIVE REMEDY UNDER THIS WARRANTY, UNDER ANY EXPRESS WARRANTY OR UNDER ANY IMPLIED WARRANTIES NOT NEGATED HEREBY (INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE), IS **REPLACEMENT**; PROVIDED: (a) THE CLAIMED DEFECT IS

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#### **Exclusion of Consequential and Incidental Damages**

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THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY DISCLAIMED.

#### **Severability**

Any provision of this warranty which is invalid, prohibited or unenforceable in any jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such invalidity, prohibition or unenforceability without invalidating the remaining provisions hereof, and any such invalidity, prohibition or unenforceability in any such jurisdiction shall not invalidate or render unenforceable such provision in any other jurisdiction.

## Service

For Service or Technical Assistance: Contact your TLV representative or your regional TLV office.

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