

**INSTRUCTION MANUAL
FOR
Infrared Thermocouple
RD-300 series**

Thank you for your purchase of our Infrared Thermocouple RD-300 series. This manual contains instructions for the mounting, the functions, the operations and the notes when operating the RD-300 series. Please read and understand this instruction manual before starting operation.
To prevent accidents by mis-handling of this Thermocouple, please arrange to give this manual into the hands of the operator who actually uses our product.
No.RD31E3 '09.01

1. Measuring objects

- Non-problem objects (Most of the nonmetal surface)
Food, Paper, Plastic, Coated metal, Stone, Soil, Glass, Liquid, Textile, etc.
- Somewhat difficult objects
Dimly lustrous metal, Thin clear plastic, etc.
- Difficult objects
Plated lustrous metal, Non-coated metal, etc.

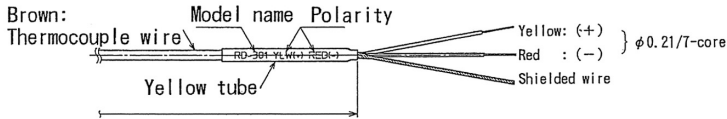
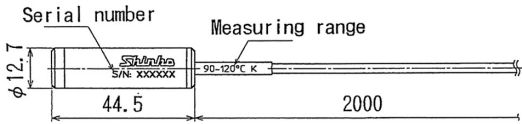
In case measurement is difficult, it is possible by increasing the emissivity using the black tape.

2. Mounting

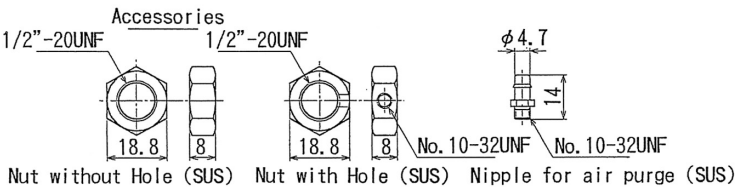
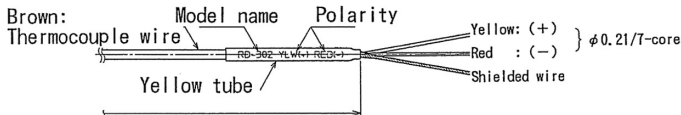
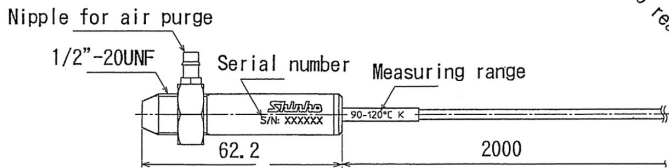
- When mounting the RD-300, take notice of the following matters.
- Mount the RD-300 so as to the head is as close as possible to the measuring objects.
- As for the ambient temperature of the RD-300, it should not exceed 100°C. If it exceeds 100°C, it is recommended that the cooling jacket [CJK-1] (Sold separately) be used to protect the sensor. (Make inquiries.)
- The lens of the RD-300 should not be covered with dust or powder.
- Fasten the screw with approximately 3 to 4kgf·cm of torque.
- When using the RD-300 series in steam environment, use the RD-302, 305 or 310 type provided the air purge. (Make inquiries.)

3. External dimensions (Unit: mm)

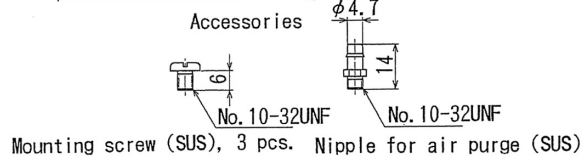
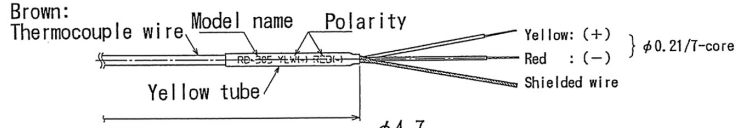
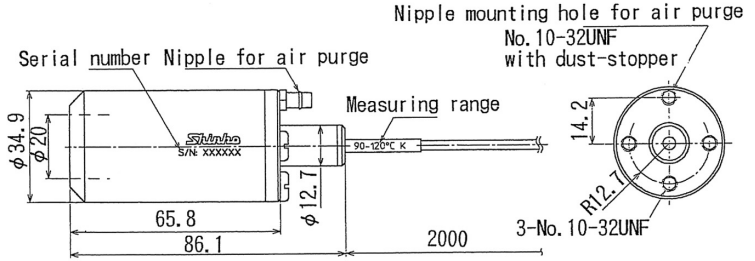
3.1 RD-301



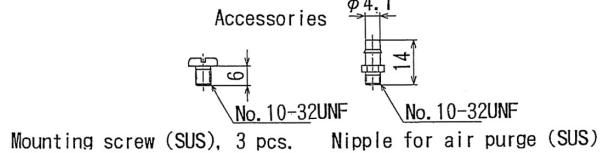
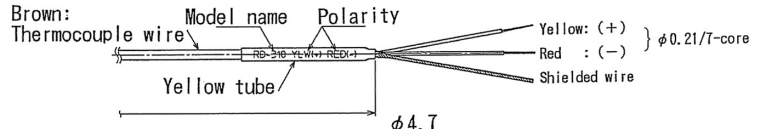
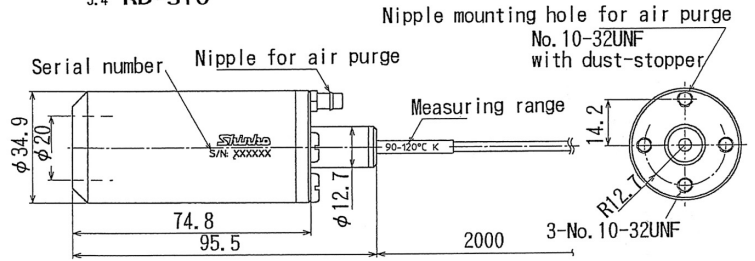
3.2 RD-302



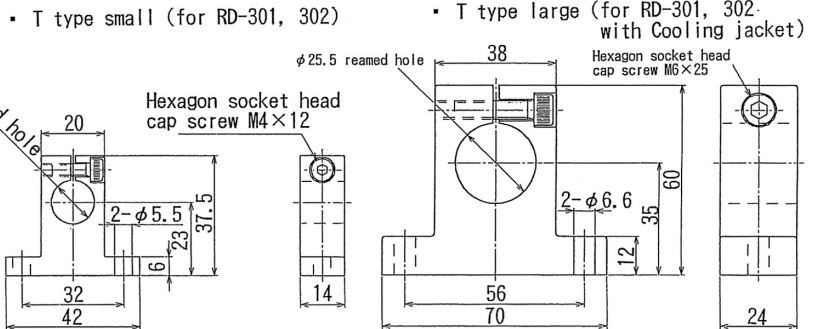
3.3 RD-305



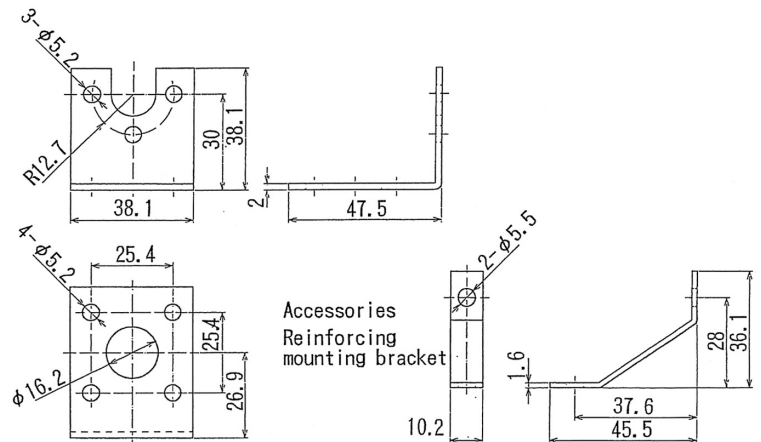
3.4 RD-310



3.5 Mounting bracket (Sold separately)



• MB-1 [L type] (for RD-305, 310)



4. Wiring

Warning

Turn the power supplied to the receiving instrument off before wiring or checking done. If working or touching the terminal with the power on status, there is a possibility of Electric Shock which can cause severe injury or death.

4.1 Notices when wiring

- Connect the Red wire of the RD-300 to the minus (-) side of the receiving instrument, and Yellow wire to the plus (+) side.
- Use K type of thermocouple wire when the lead wire is required to be extended. (Make inquiries.)
- When using the RD-300 in the environment electrical noise existent, connect a shielded wire to the ground terminal of the receiving instrument. If the receiving instrument has no ground terminal, connect the shielded wire to the ground terminal of the control panel on which the receiving instrument is mounted.

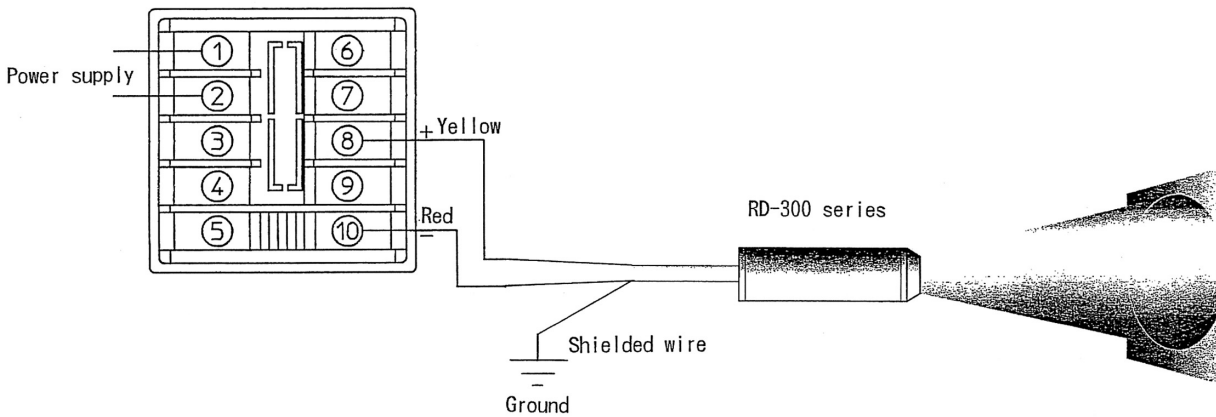
4.2 Wiring example

The performance of the RD-300 will be shown by connecting with the controller provided fast sampling period because the response time of the RD-300 is fast. We recommend to use with FC series controllers for the combination. (Make inquiries.)

FC series

- FCS series (48×48×110mm, W×H×D)
- FCR series (48×96×110mm, W×H×D)
- FCD series (96×96×110mm, W×H×D)

FCS-100 series

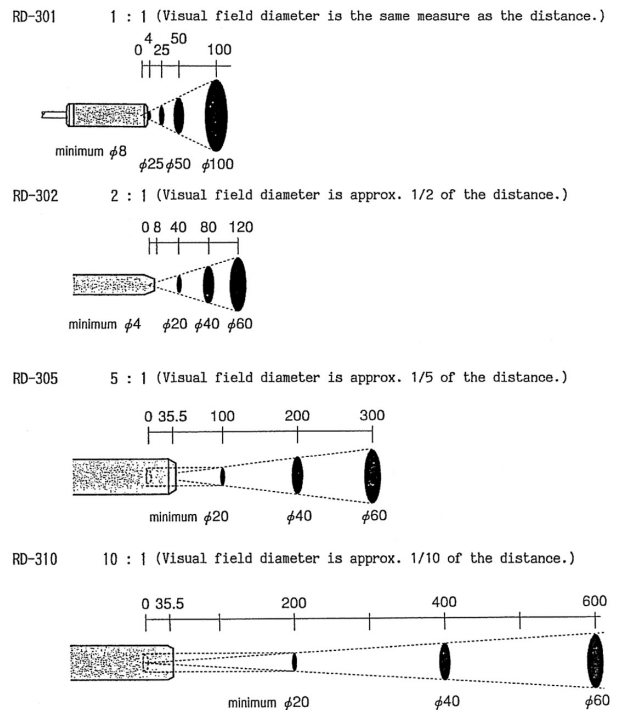


Response time	: 200ms (at 63.2% response)
Output	: Correspond to Electromotive force of the thermocouple K
Ambient temp. compensation range	: 27 to 93°C
Allowable ambient temp.	: -18 to 100°C
Temperature coefficient	: 0.04% of the indicated value per ambient temperature change 1°C.
Output impedance:	RD-301, Approx. 3kΩ RD-302, Approx. 4 to 8kΩ (differs from the measuring range) RD-305, Approx. 4 to 8kΩ (differs from the measuring range) RD-310, Approx. 4 to 8kΩ (differs from the measuring range)
Weight (including 2m of output cable)	RD-301, Approx. 40 g RD-302, Approx. 47 g, Accessories Approx. 24 g RD-305, Approx. 187 g, Accessories Approx. 7 g RD-310, Approx. 197 g, Accessories Approx. 7 g
Accessories	RD-301, Instruction manual 1 copy (common) RD-302, Instruction manual 1 copy (common) Nipple for air purge 1 pcs. Nipple mounting Nut 1 pcs. (with Hole) Locking Nut 1 pcs. (without Hole) RD-305, Instruction manual 1 copy (common) Nipple for air purge 1 pcs. Stainless steel screw to mount the body M5×6 3 pcs. RD-310, Instruction manual 1 copy (common) Nipple for air purge 1 pcs. Stainless steel screw to mount the body M5×6 3 pcs.

5. Specifications

Name	: Infrared Thermocouple (Equivalent to K type)
Model name	: RD-301, RD-302, RD-305 and RD-310
Measurable range:	RD-301, -18 to 250°C RD-302, -18 to 250°C RD-305, -18 to 250°C RD-310, -18 to 250°C
Type of measuring range	: -18 to 25°C, 5 to 45°C, 25 to 80°C, 70 to 105°C, 90 to 120°C, 115 to 155°C, 145 to 190°C and 180 to 250°C
External dimension	: RD-301, φ12.7×44.5mm (Dia.×Length) RD-302, φ12.7×62.2mm (Dia.×Length) RD-305, φ34.9×86.1mm (Dia.×Length) RD-310, φ34.9×95.5mm (Dia.×Length)
Mounting method	: RD-301, Fixed to the mount with the T type of mounting bracket RD-302, Fixed to the mount with the T type of mounting bracket or Fixed to the panel (maximum thickness 4mm, Panel outout, φ13) RD-305, Fixed to the mount with the L type of mounting bracket RD-310, Fixed to the mount with the L type of mounting bracket (Mounting bracket is sold separately)
Material of light receiving window	: Silicon lens
Air purge	: RD-301, None RD-302, Built-in RD-305, Built-in RD-310, Built-in
Case material	: Stainless steel, SUS303 equivalent
Housing	: Closed and Water-proof structure, IP67 (excluding cable part)
Output cable	: Thermocouple wire, length 2m (Teflon coating, Heat-proof 200°C)
Detection element	: Thermopile
Measuring wave length	: 6.5 to 14.0μm
Measuring Visual field	: RD-301, Measuring distance and Visual field diameter (1 : 1) RD-302, Measuring distance and Visual field diameter (2 : 1) RD-305, Measuring distance and Visual field diameter (5 : 1) RD-310, Measuring distance and Visual field diameter (10 : 1)
Field of view	: RD-301, Approx. 53° RD-302, Approx. 28° RD-305, Approx. 11° RD-310, Approx. 6°
Accuracy	: When the emissivity of the object is 0.9, it is within ±3% of the indicated value or ±3.3°C, whichever is greater. However, for the range 185 to 250°C, within ±5% of indicated value
Repeatability	: Within ±1% of the indicated value or ±1°C, whichever is greater.

Measuring distance : Visual field diameter (Unit: mm)



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