

Preface

Thank you for purchasing our Infrared Temperature Sensor RD-500 series. This manual contains instructions for the mounting, functions, operations and notes when operating the RD-500. To ensure safe and correct use, thoroughly read and understand this manual before using this sensor. To prevent accidents arising from the misuse of this sensor, please ensure the operator receives this manual.

Caution

- This sensor should be used in accordance with the specifications described in the manual. If it is not used according to the specifications, it may malfunction or cause a fire.
- Be sure to follow all of the warnings, cautions and notices. If they are not observed, serious injury or malfunction may occur.
- The contents of this instruction manual are subject to change without notice.
- Care has been taken to assure that the contents of this instruction manual are correct, but if there are any doubts, mistakes or questions, please inform our sales department.
- This instrument is designed to be used in close proximity with the target object. Measures must be taken to ensure that the operator cannot touch power terminals or other high voltage sections.
- Any unauthorized transfer or copying of this document, in part or in whole, is prohibited.
- Shinko Technos CO., LTD. is not liable for any damage or secondary damage(s) incurred as a result of using this product, including any indirect damage.

Safety Precautions (Be sure to read these precautions before using our products.)

The safety precautions are classified into categories: "Warning" and "Caution". Depending on the circumstances, procedures indicated by  Caution may cause serious results, so be sure to follow the directions for usage.

Warning

Procedures which may lead to dangerous conditions and cause death or serious injury, if not carried out properly.

Caution

Procedures which may lead to dangerous conditions and cause superficial to medium injury or physical damage or may degrade or damage the product, if not carried out properly.

Warning

- To prevent an electric shock or fire, only Shinko or other qualified service personnel may handle the inner assembly.
- To prevent an electric shock, fire or damage to the instrument, parts replacement may only be undertaken by Shinko or other qualified service personnel.

Safety Precautions

- To ensure safe and correct use, thoroughly read and understand this manual before using this instrument.
- This instrument is intended to be used for industrial machinery, machine tools and measuring equipment. Verify correct usage after purpose-of-use consultation with our agency or main office. (Never use this instrument for medical purposes with which human lives are involved.)
- External protection devices such as protective equipment against excessive temperature rise, etc. must be installed, as malfunction of this product could result in serious damage to the system or injury to personnel. Also proper periodic maintenance is required.
- This instrument must be used under the conditions and environment described in this manual. Shinko Technos Co., Ltd. does not accept liability for any injury, loss of life or damage occurring due to the instrument being used under conditions not otherwise stated in this manual.

Caution with Respect to Export Trade Control Ordinance

To avoid this instrument from being used as a component in, or as being utilized in the manufacture of weapons of mass destruction (i.e. military applications, military equipment, etc.), please investigate the end users and the final use of this instrument. In the case of resale, ensure that this instrument is not illegally exported.

1. Model

1.1 Model

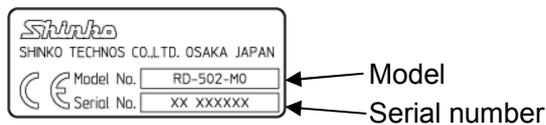
RD - 5 □□ - □ □		
Field of View	02	2:1 (*1)
	15	15:1
	CF	Close focus (*2)
Temperature Range	M	0 to 250°C
	H	0 to 500°C
Output	0	Direct current: 4 to 20mA DC (2-wire type)

(*1): For field of view 2:1, its temperature range is 0 to 250°C.

(*2): If close focus is selected, its temperature range will be 0 to 500°C.

1.2 How to Read the Model Label

The model label is attached to the side of the sensor.



(Fig. 1.2-1)

2. Target Objects

- **Non-problematic objects**

Food, paper, plastics, cloth, leather, cigarettes, medicine, chemicals, rubber, asphalt, coal, etc.

- **Difficult objects**

Plated lustrous metals, uncoated or unpainted metals, etc.

- **Slightly problematic objects**

Low lustrous metals, thin transparent plastics, etc.

If measurement is difficult, black body tape can be used to raise emissivity.

3. Installation

Ensure the installation location corresponds to the following conditions.

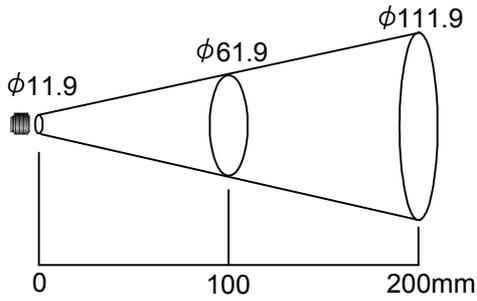
- The sensing head should be kept as close as possible to the object.
- The ambient temperature of this sensor should not exceed 70°C (158°F).
- The sensor lens should be protected from being covered with powder, dust, etc.
- Use an air purge collar (APSW or APSN, sold separately) when using this sensor in a place where a lot of fumes, dust or moisture is present (Airflow: 0.5 to 1.5 liter/sec)
- Install this sensor away from electrical noise, motors or generators.

For the mounting method of the Fixed-mounting bracket (FBS, sold separately) and Adjustable-mounting bracket (ABS, sold separately), see page 3.

For the mounting method of the Air purge collar (APSW or APSN, sold separately), see page 4.

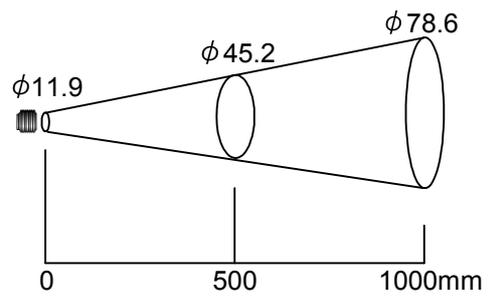
3.1 Diameter of Target Spot Measured versus Distance from Sensing Head

RD-502-M0 (Field of view 2:1)



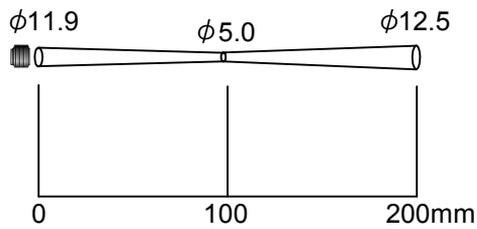
(Fig. 3.1-1)

RD-515-M0, RD-515-H0 (Field of view 15:1)



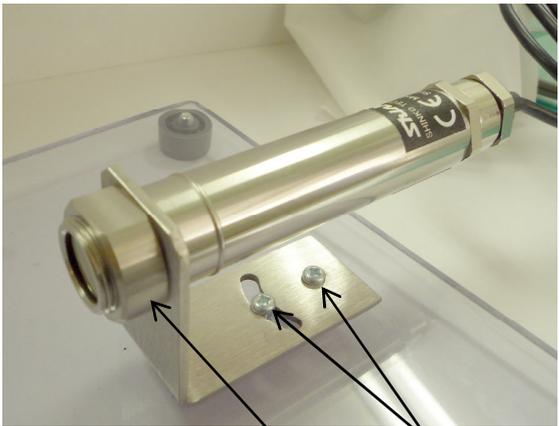
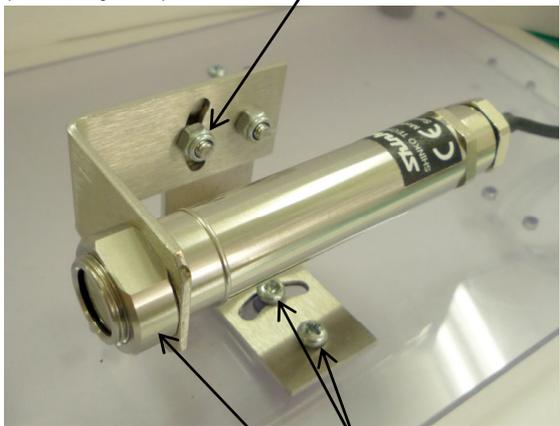
(Fig. 3.1-2)

RD-5CF-H0 (Close focus)



(Fig. 3.1-3)

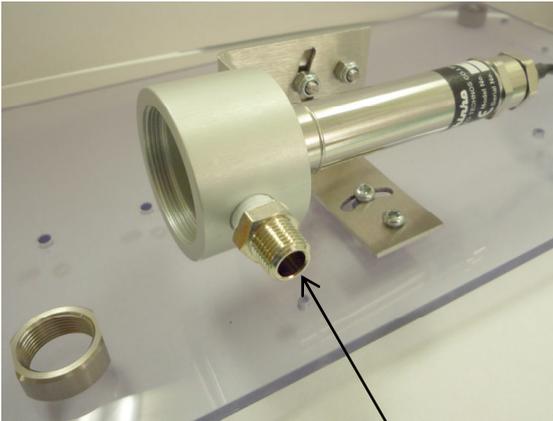
3.2 Mounting Method of the Fixed-mounting Bracket (FBS, sold separately) and Adjustable-mounting Bracket (ABS, sold separately)

<p>Fixed-mounting bracket Type: FBS</p> 	<p>Adjustable-mounting bracket Type: ABS</p> 
<p>Mounting Example</p> <ol style="list-style-type: none"> Fix the mounting bracket with screws at the installation location. (Recommended size: M4 – not included) Remove the mounting nut, and fasten the nut again after inserting the sensor into the hole of the mounting bracket. 	<p>Mounting Example</p> <ol style="list-style-type: none"> Fix the mounting bracket with screws at the installation location. (Recommended size: M4 – not included) Remove the mounting nut, and fasten the nut again after inserting the sensor into the hole of the mounting bracket. To adjust the sensor upward or downward, use a hexagonal wrench. (Hex key 2.5) 

3.3 Mounting Method of the Air Purge Collar (APSW or APSN, sold separately)

The air purge collar is used to suppress the temperature rise of the sensor body, and to keep dust, etc. away from the lens.

- Applicable airflow for the air purge collar: 0.5 to 1.5 liter/min
- The sensor will operate in ambient temperature up to 70°C, so be careful not to exceed 70°C of ambient temperature when using the sensor.
- Blow air clean and suitable for measurement.

<p>Air purge collar (For field of view 2:1) Type: APSW</p> 	<p>Air purge collar (For field of view 15:1, and close focus) Type: APSN</p> 
<p>Mounting Example</p> <ol style="list-style-type: none"> ① Remove the mounting nut. ② After inserting the sensor into the hole of the mounting bracket, insert the air purge collar to the sensor and fasten it. (Please carefully set-aside the mounting nut.)  <ol style="list-style-type: none"> ③ Connect a tube, connector or pump to the air purge collar. 	<p>Mounting Example</p> <ol style="list-style-type: none"> ① Remove the mounting nut. ② After inserting the sensor into the hole of the mounting bracket, insert the air purge collar to the sensor and fasten it. (Please carefully set-aside the mounting nut.)  <ol style="list-style-type: none"> ③ Connect a tube, connector or pump to the air purge collar.

4. Wiring



Warning

Turn OFF the power supply to the indicator/controller before wiring.

Working on or touching the terminal with the power switched ON may result in severe injury or death due to electric shock.

4.1 Note about Wiring

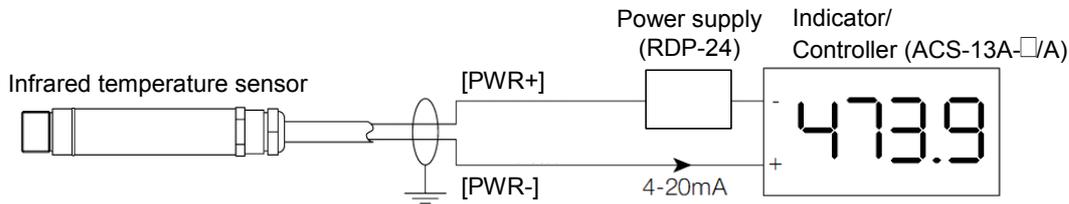
- When using the sensor in an environment where electrical noise is present, use a shielded wire, and connect it to the ground terminal of the indicator/controller.
If the indicator/controller does not have a ground terminal, connect to the ground terminal of the control panel.

4.2 Wiring Example

The wiring example for the RD-500 and the power supply (RDP-24) and indicator/controller are shown below.

The code in the [] is written on the mark tube of the sensor terminal.

RD-502-M0, RD-515-M0, RD-515-H0



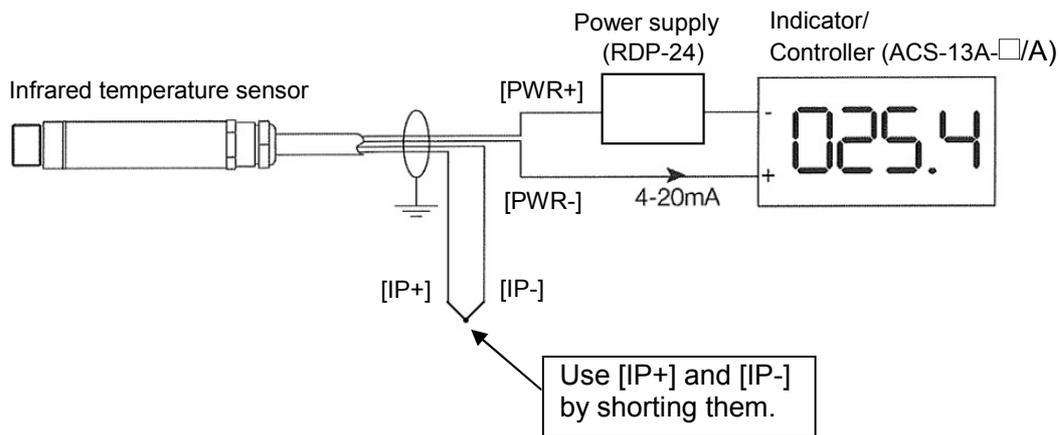
Emissivity can be set on the ACS-13A-□/A.

For details, refer to the instruction manual for the ACS-13A-□/A.

If a fixed emissivity of 0.95 is used, any indicator or controller can be used.

(Fig. 4.2-1)

RD-5CF-H0



Emissivity can be set on the ACS-13A-□/A.

For details, refer to the instruction manual for the ACS-13A-□/A.

If a fixed emissivity of 0.95 is used, any indicator or controller can be used.

(Fig. 4.2-2)

5. Operation

Attention

- If ambient temperature is rapidly changing, leave the sensor for more than 20 minutes as it is, then measure the temperature.
- Do not measure temperature near a large magnetic field (example: Arc welding machine, induction heater, etc.). Measurement errors will be caused due to electromagnetic disturbance.

After completing installation for the target object and wiring, start operation following the procedures below.

- (1) Turn the power to the sensor ON (RDP-24).
- (2) Turn ON the power to the indicator/controller (ACS-13A-□/A).
- (3) Measure the temperature.

6. Specifications

6.1 Name, Model

Name	Infrared temperature sensor
Model	RD-5□□-□0

6.2 Rating

Temperature Range	<table border="1"> <thead> <tr> <th>Model</th> <th>Temperature range</th> </tr> </thead> <tbody> <tr> <td>RD-502-M0</td> <td>0 to 250°C</td> </tr> <tr> <td>RD-515-M0</td> <td>0 to 250°C</td> </tr> <tr> <td>RD-515-H0</td> <td>0 to 500°C</td> </tr> <tr> <td>RD-5CF-H0</td> <td>0 to 500°C</td> </tr> </tbody> </table>		Model	Temperature range	RD-502-M0	0 to 250°C	RD-515-M0	0 to 250°C	RD-515-H0	0 to 500°C	RD-5CF-H0	0 to 500°C
	Model	Temperature range										
	RD-502-M0	0 to 250°C										
	RD-515-M0	0 to 250°C										
	RD-515-H0	0 to 500°C										
RD-5CF-H0	0 to 500°C											
Power Supply	24V DC (Max 28V DC), 25mA											

6.3 General Structure

External Dimensions	φ18 x 103mm (diameter x length)
Mounting	Fixed using a mounting bracket (The mounting bracket is sold separately.)
Material	Stainless steel SUS304
Drip-proof/Dust-proof	IP65
Cable Length	1m

6.4 Performance

Accuracy	±1% of reading or ±1°C, whichever is greater
Repeatability	±0.5% of reading or ±0.5°C, whichever is greater
Emissivity	Fixed at 0.95 0.200 to 1.000 [When the digital indicating controller (ACS-13A-□/A, sold separately) is used]
Response	240ms (90% response)
Spectral Range	8 to 14 μm
Max. Load Resistance	900Ω (Direct current output) (for 24V DC)

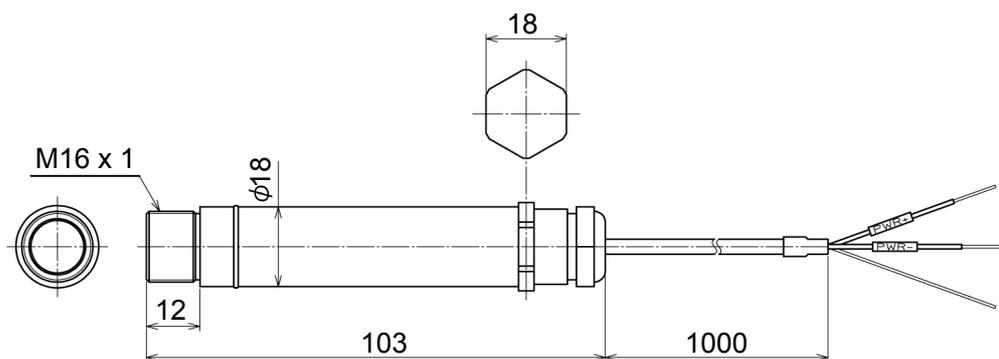
6.5 Other

Ambient Temperature	0 to 70°C	
Ambient Humidity	Max. 95%RH (non-condensing)	
Weight	Approx. 100g (Cable included)	
Accessories Included	Instruction manual: 1 copy, Nut: 1 piece	
Accessories Sold Separately	<ul style="list-style-type: none"> • Fixed-mounting bracket (FBS) <ul style="list-style-type: none"> • Air purge collar (APSW) (For field of view 2:1) 	<ul style="list-style-type: none"> • Adjustable-mounting bracket (ABS) <ul style="list-style-type: none"> • Air purge collar (APSN) (For field of view 15:1, and close focus)

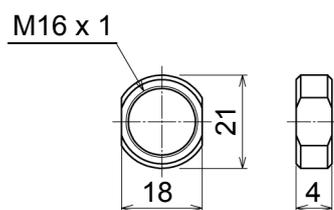
	<ul style="list-style-type: none"> • Digital indicating controller (ACS-13A-□/A)  <ul style="list-style-type: none"> • Power supply for the RD-500/600 (RDP-24) 
Safety Standards	RoHS directive compliant CE marking compliant

7. External Dimensions (Scale: mm)

RD-502-M0, RD-515-M0, RD-515-H0

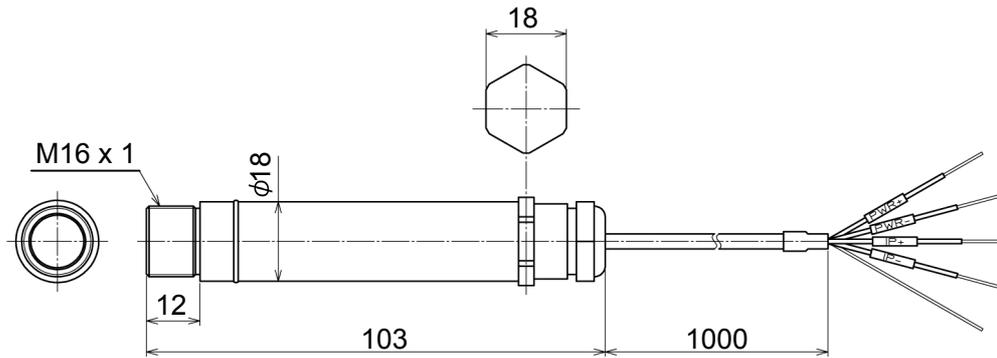


Nut (Accessories Included)

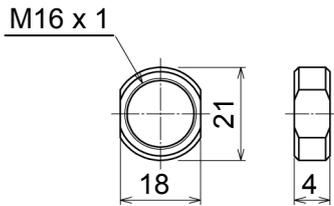


(Fig. 7-1)

RD-5CF-H0



Nut (Accessories included)



(Fig. 7-2)

8. Troubleshooting

If problems arise, please check the following content.

Problem	Possible Cause and Solution
No output	<ul style="list-style-type: none"> No power. Ensure that the power is being supplied properly.
Abnormal temperature	<ul style="list-style-type: none"> Wiring may be incorrect. Check the wiring. Sensor may be disconnected or burnt out. Check if the sensor is conducting properly. Sensor lens may be dirty. Remove any dirt on the lens. Always keep the lens clean. Foreign particles on the lens affect measurement accuracy.

***** Inquiries *****

For any inquiries about this unit, please contact our agency or the vendor where you purchased the unit after checking the model and serial number.

In addition to the above, please let us know the details of the malfunction, or discrepancy, and the operating conditions.

**SHINKO TECHNOS CO., LTD.
OVERSEAS DIVISION**

Head Office : 2-5-1, Senbahigashi, Minoo, Osaka, Japan

URL: <http://www.shinko-technos.co.jp>

E-mail: overseas@shinko-technos.co.jp

Tel : 81-72-727-6100

Fax: 81-72-727-7006