


To prevent accidents arising from the use of this product, please ensure the operator using it receives this manual.

Notes

- This instrument should be used according to the specifications described in this manual. If it is not used according to the specifications, it may malfunction or break down.
- Be sure to follow the warnings, cautions and notices. If not, serious injury or accidents may occur.
- The specifications of the THD-500 series and 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.
- Any unauthorized transfer or copying of this document, in part or in whole, is prohibited.
- Shinko Technos is not liable for any damages or secondary damages incurred as a result of using this product, including any indirect damages.

SAFETY PRECAUTIONS (Be sure to read these precautions before using our products)

The safety precautions are classified into categories: "Warning" and "Caution". Depending on circumstances, procedures indicated by  Caution may be linked to 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.

SAFETY PRECAUTIONS (Be sure to read these precautions before using our products)

Warning

Turn the power supply to the instrument OFF before wiring.
Working with the power switched ON may result in an Electric Shock which could cause severe injury or death.

Caution

- Never disassemble, modify or repair THD-500 (hereafter, THD) yourself. In doing so, the THD guarantee will become invalidated.
- Do not drop, shock or put a heavy load on the THD, as this may lead to malfunction or jamming.
[Use this instrument under the conditions below.]
- **A minimum of dust, and an absence of corrosive gases**
- **No acid, alkali, organic solvent, flammable and explosive gases**
- **Few mechanical vibrations or shocks**
- **No exposure to direct sunlight, an ambient temperature of 0 to 50°C (32 to 122°F) without rapid temperature change**
- **An ambient non-condensing humidity of 90%RH or less**
- **The units away from large capacity electromagnetic switches or cables**
- **No water, oil or chemicals or where the vapors of these substances can come into direct contact with the unit.**

1. Model name

1.1 Model name

THD-500-

A: Wall mounting type
 B: Flush
 V: Wall mounting type

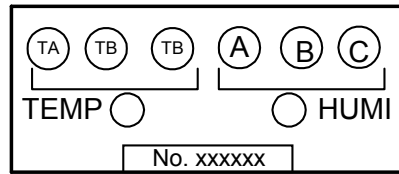
1.2 How model nameplate is indicated

[Nameplate on the top of the terminal case cover]



[Fig. 1.2-1]

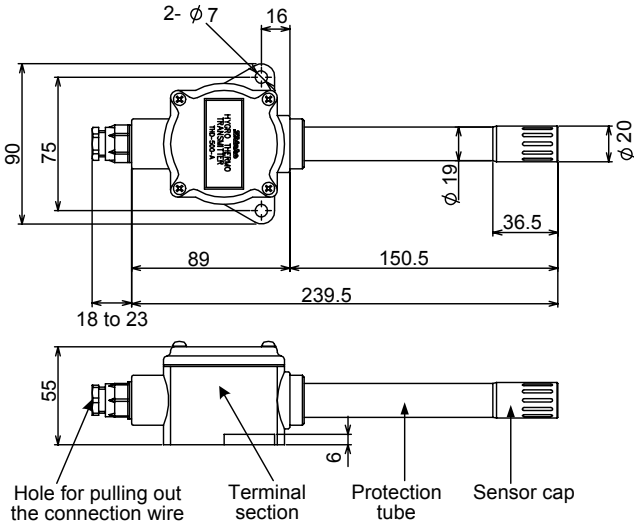
[Terminal label in the terminal case]



[Fig. 1.2-2]

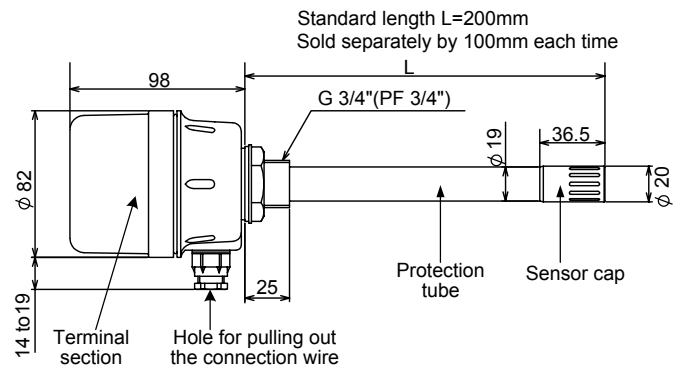
2. Names of the sections and external dimension (Unit: mm)

[THD-500-A]



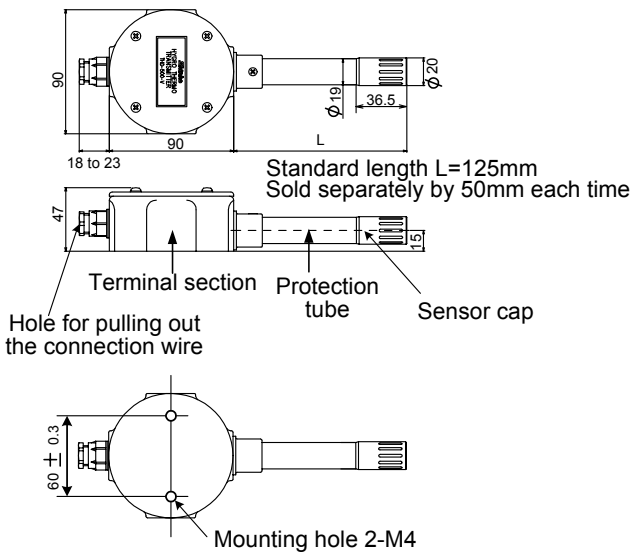
[Fig. 2-1]

[THD-500-B]



[Fig. 2-2]

[THD-500-V]



[Fig. 2-3]

3. Mounting

3.1 Mounting environment

Select a corrosive-gas-free site with plenty of ventilation, where and stable humidity for measurement can be obtained.

(Contact our sales office if you have questions.)

- If there is a lot of corrosive gas around which may hasten deterioration of the humidity sensor, it may cause measurement errors.

Select a site where there are no gases such as chloric, hydrochloric, sulfur dioxide, carbon dioxide, nitric acid, ammonia, ethanol, methane and no cigarette smoke.

- Select a site where water, oil, chemicals and their vapors will not come in direct contact with the instrument.
- Select a site with little dust.
- Select a site not exposed to direct sunlight or rapid temperature change. Make sure the site has an ambient temperature 0 to 50°C (32 to 122°F).
- Select a site where there are few mechanical vibrations or shocks when the THD is fixed.
- Select a site where humidity is in the range of 20 to 90%RH. (Set the waterproof filter [THF-500] in a condensing environment, otherwise sensors may deteriorate.)
- Keep the wire connected between the THD-500 and receiving instrument away from the large capacity electromagnetic switches or cables through which large current is flowing.

3.2 Mounting method

- (1) Mount the THD-500 (-A, -B, -V) vertically or horizontally. If it is mounted in other directions, water may enter the gap between the sensor cap and the protection tube, which may cause malfunction of the sensor. [Fig. 3.2-1]

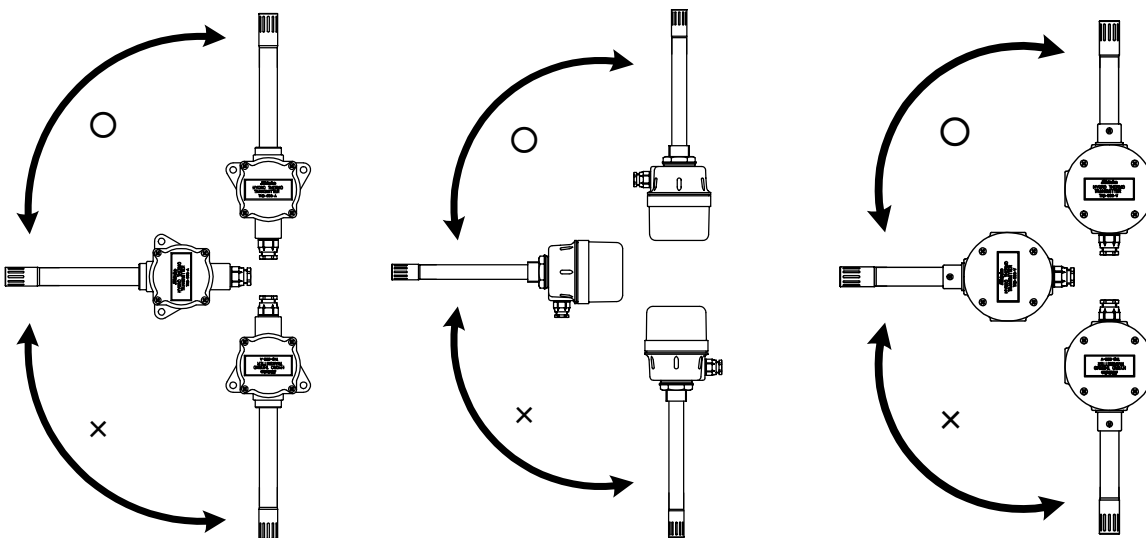
Mount the protection tube perpendicular to air flow and keep the THD-500 away from the wall as far as possible (50mm or greater). However, make sure to mount the humidity sensor HD-S in the direction as indicated by the diagrams [Fig. 3.2-2], [Fig. 3.2-3] and [Fig. 3.2-4].

- (2) Securely mount the THD-500-A with the screws provided, THD-500-B with the nuts provided (PF3/4) and THD-500-V with the screws provided after removing the terminal case cover. Refer to [Fig. 3.2-1], [Fig. 3.2-2] and [Fig. 3.2-3].

However, for the mounting of THD-500-B, optional compression fitting (CF) or loose flange (LF) can be used as well.

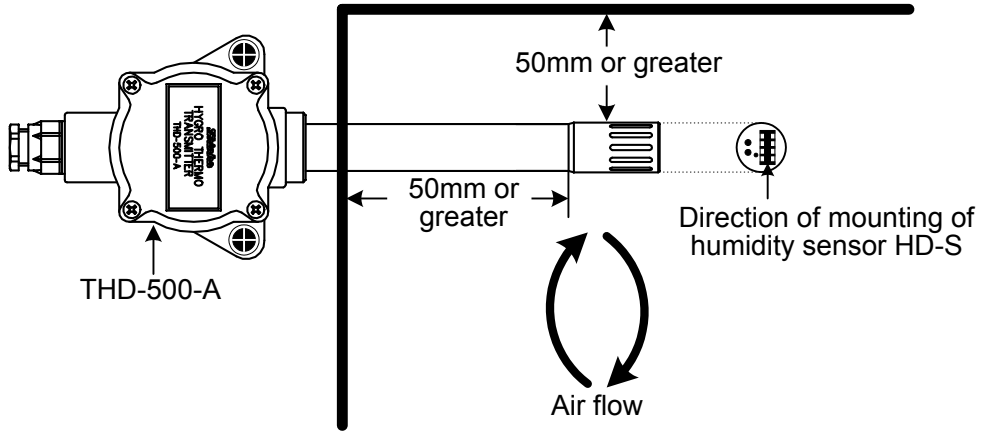
- (3) After connecting the connection wire to the terminal, securely mount the humidity-proof connector of the hole for pulling out connection wire, and rubber packing of the terminal case cover. Otherwise the terminal section will rust and this may cause malfunction.

Set the waterproof filter THF-500 at the sensor part in a condensation environment.



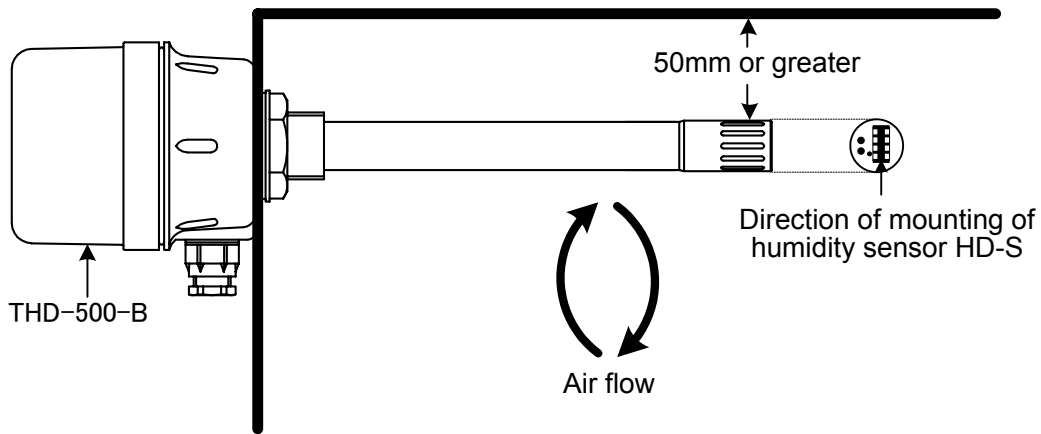
[Fig. 3.2-1]

● Mounting example
[THD-500-A]



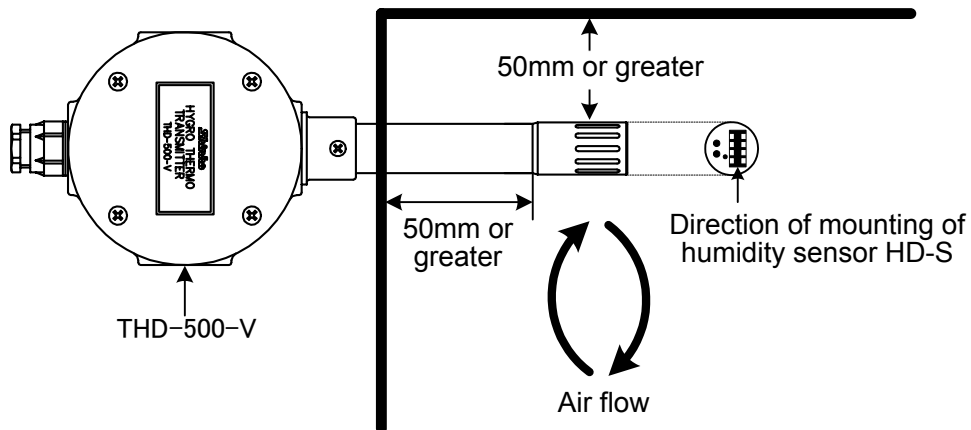
[Fig. 3.2-2]

[THD-500-B]



[Fig. 3.2-3]

[THD-500-V]



[Fig. 3.2-4]

4. Wiring connection



Warning

Turn the power supply to the instrument OFF before wiring.

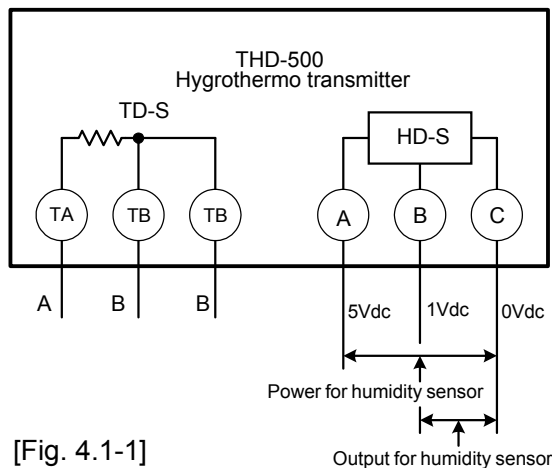
Working with the power switched ON may result in an Electric Shock which could cause severe injury or death.



Caution

- For the connection of THD-500 terminals, use a solderless terminal with an insulation sleeve that fits to the M3 screw, and turn the power supply to the instrument OFF before wiring.
- Tighten the M3 screw with specified torque or less.
The M3 screw may be damaged if tightened with greater than the specified torque,
- When wiring, keep the input wire (RTD, voltage 0 to 1Vdc) of the THD-500 away from the AC source wire and the load wire.

4.1 Terminal arrangement



[Fig. 4.1-1]

A: Power for the humidity sensor 5Vdc (+)

B: Output for the humidity sensor 0 to 1Vdc (+)
(Equivalent to 0 to 100%RH)

C: Humidity output common terminal, power source common terminal (-)

TA: }
TB: } Output for temperature sensor, Pt100 (3-wire system output)
TB: }

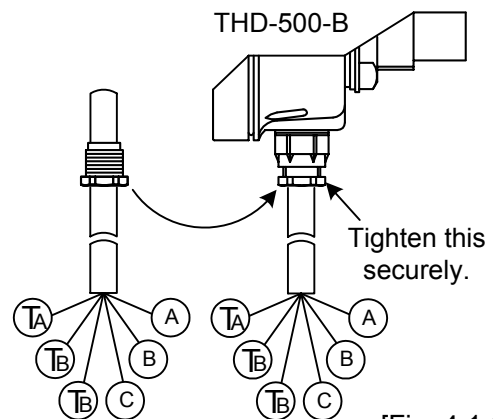
- Hole for pulling out connection wire
Pass the connection wire through humidity-proof connector and connect to the THD-500 terminals, then securely fasten the screws.

THD-500-B is used in the explanation of [Fig. 4.1-2].

THD-500-A and THD-500-V are connected in the same way as the THD-500-B.

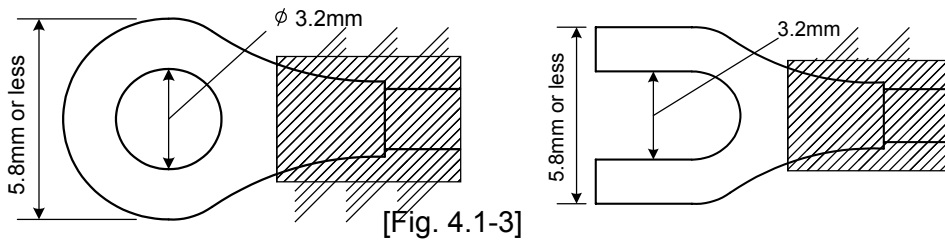
- Solderless terminal

Use a solderless terminal with an insulation sleeve that fits to the M3 screw as shown below.



[Fig. 4.1-2]

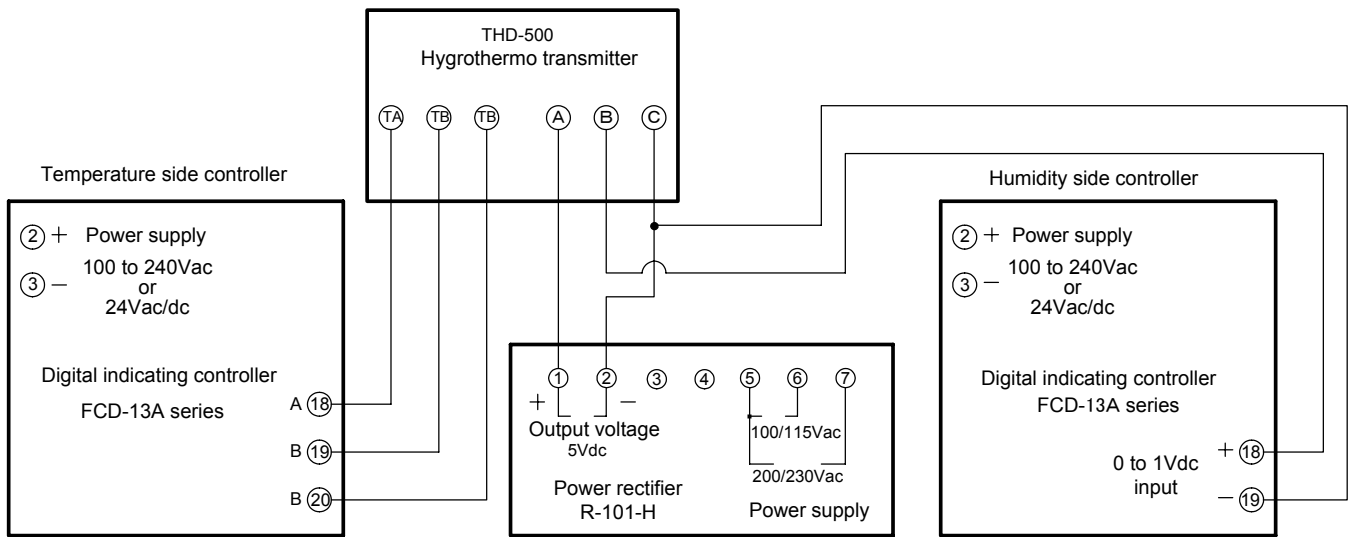
Solderless terminal	Manufacturer	Model name	Tightening torque
Y type	Nichifu Terminal Industries CO.,LTD.	1.25Y-3	0.6N·m Max. 1.0N·m
	Japan Solderless Terminal MFG CO.,LTD.	VD1.25-B3A	
Round type	Nichifu Terminal Industries CO.,LTD.	1.25-3	0.6N·m Max. 1.0N·m
	Japan Solderless Terminal MFG CO.,LTD.	V1.25-3	



[Fig. 4.1-3]

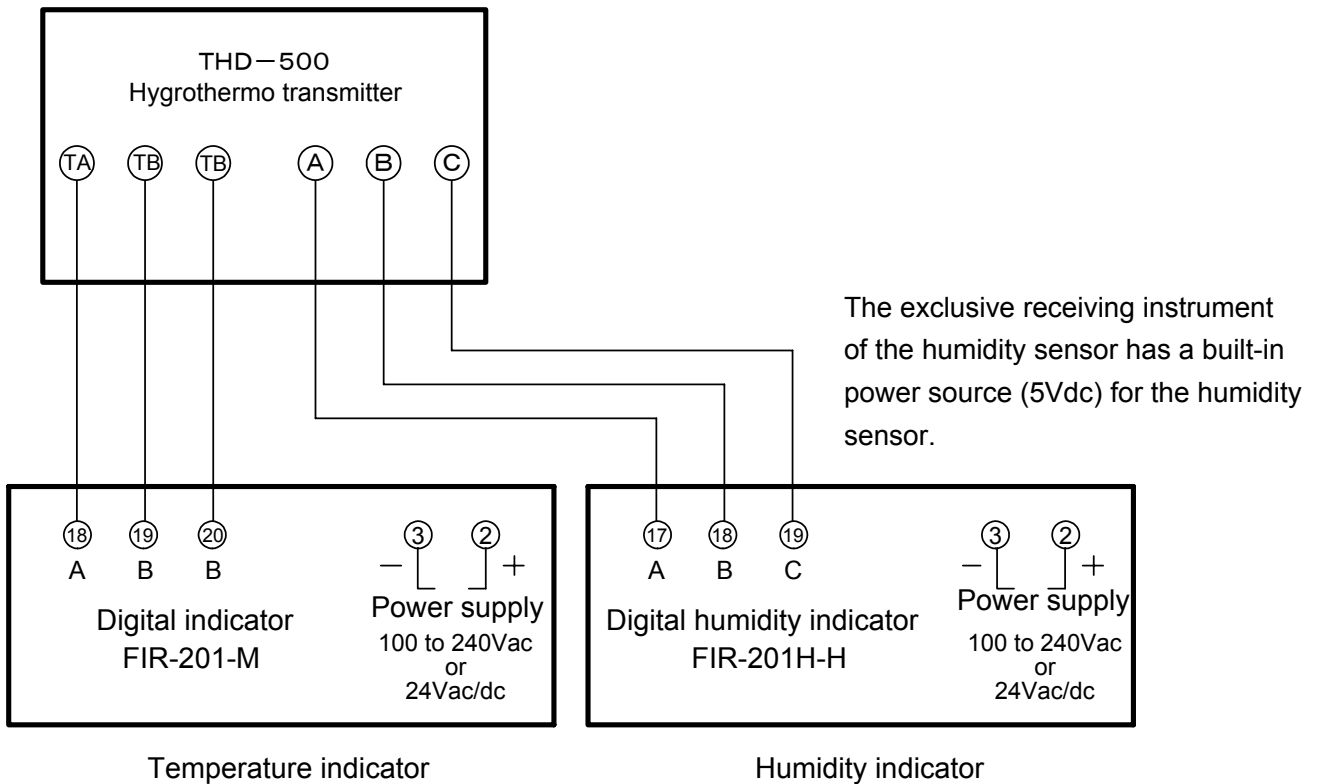
4.2 Wiring connection example

- Example of Temperature and humidity control using a power rectifier



[Fig. 4.2-1]

- Example of Temperature and humidity monitoring using the temperature indicator and the exclusive indicator of the humidity sensor



[Fig. 4.2-2]

4.3 Exchanging temperature sensor and humidity sensor



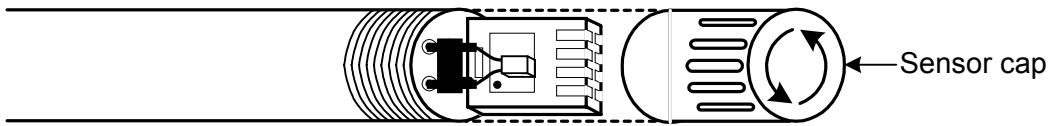
Caution

- Do not apply any sensors other than temperature sensor TD-S and humidity sensor HD-S.
- Keep the socket and sensor terminal clean.
If the socket or sensor terminal is stained, it is unable to measure correctly due to imperfect contact.
- Do not add extra force to the sensor or touch it with wet hands or hands with chemicals on them.
- Do not cleanse the sensor.

● How to change temperature sensor and humidity sensor

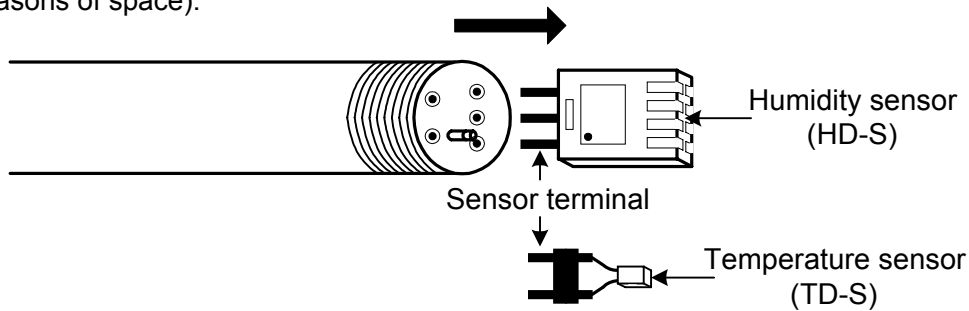
Hygrothermo transmitter (THD-500-A, -B, -V) is described as THD in the following explanation.

- (1) Rotate the THD sensor cap in the direction of the arrow (counterclockwise), then pull it out directly with the device set in a vertical position (although it has been depicted horizontally here for reasons of space).



[Fig. 4.3-1]

- (2) Pull out the deteriorated temperature sensor (TD-S) or humidity sensor (HD-S) in the direction of the arrow with the device set in a vertical position (although it has been depicted horizontally here for reasons of space).

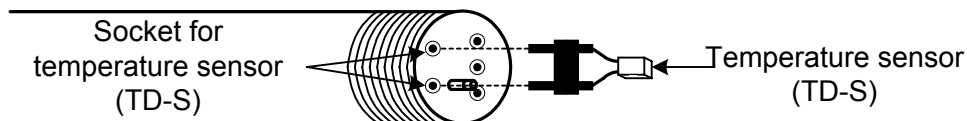


[Fig. 4.3-2]

- (3) Mount the new temperature sensor (TD-S) into the temperature sensor socket directly with the device set in a vertical position (although it has been depicted horizontally here for reasons of space).

There is no polarity for the temperature sensor (TD-S).

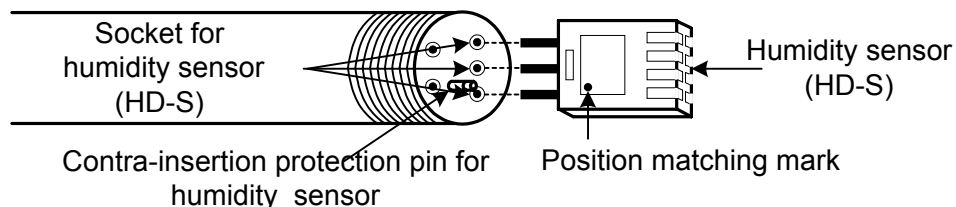
Do not touch the temperature sensor part, or it may cause errors.



[Fig. 4.3-3]

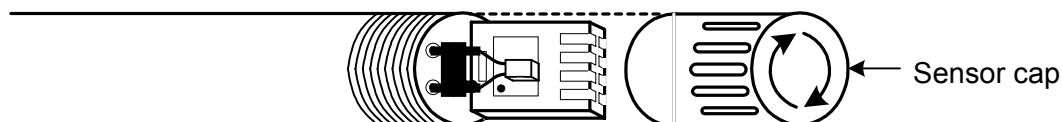
- (4) Insert the new humidity sensor (HD-S) directly into the socket for humidity sensor with the device set in a vertical position (although it has been depicted horizontally here for reasons of space).

However, since there is a set polarity for the humidity sensor (HD-S), insert the humidity sensor into the socket to match the position matching mark to the contra-insertion protection pin.



[Fig. 4.3-4]

(5) Insert the THD sensor cap with the device set in a vertical position (although it has been depicted horizontally here for reasons of space) and set it by rotating it in the direction of the arrow (clockwise).



(Fig. 4.3-5)

* Note

All the sensors used for THD-500 (-A, -B, -V) are compatible.

They can be used without calibration when exchanging.

5. Specifications

5.1 Standard specifications

Specification	THD-500-A	THD-500-B	THD-500-V
Measuring range	Temperature: 0 to 50°C Humidity: 20 to 90%RH		
Type of elements	Temperature: Platinum thin film RTD (JIS Pt100 B class) Humidity: Resistance value change type		
Accuracy	Temperature: $\pm(0.3 + 0.005[T])^{\circ}\text{C}$ (JIS C1604-1989 B class) (T: Measured temp.) Humidity: $\pm 5\%$ RH (at 10 to 50°C)		
Response time	Temperature: 35 seconds (63.2% response) Humidity: Within 2 minutes (30 \longleftrightarrow 80%RH)		
Hysteresis	Humidity: Within approx. 1%RH		
Output	Temperature: 3-wire system 100 Ω at 0°C (JIS C1604-1989 B class) Humidity: 0 to 1Vdc (equivalent to 0 to 100%RH)		
Material	Main body: Aluminum die-cast, Color: Silver metallic coating Protection tube: SUS304 Sensor cap: Polyacetal, Color: Black		
External dimension	Refer to Chapter "2. Names of the sections and external dimension"		
Applicable range	Temperature: 0 to 50°C Humidity: 20 to 90%RH		
Storage environment	Temperature: -20 to 60°C Humidity: 5 to 90%RH (No condensation)		
Supply voltage	5Vdc (Supplied by exclusive power source R-101-H or by the exclusive receiving instrument of the humidity sensor)		
Mounting	Wall mounting	Flush	Wall mounting
Weight	Approx. 500g	Approx. 550g	Approx. 450g
Accessories	Instruction manual, 1 copy Screw for mounting the main body (material BS): MN \oplus 6x20mm, 2 pieces Washer (material BS): WB-6, 2 pieces Nut (material BS): NA-6, 2 pieces	Instruction manual, 1 copy Nut for mounting the main body, 1 set	Instruction manual, 1 copy Screw for mounting the main body (material BS): MN \oplus 4x10mm, 2 pieces Washer (material BS): WB-4, 2 pieces

5.2 Supplementary

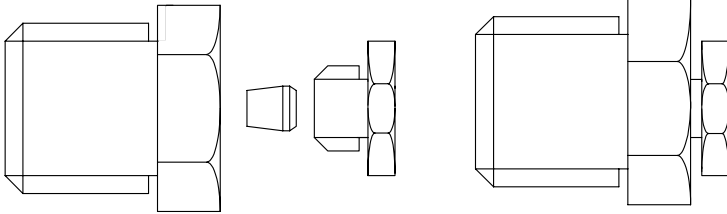
[For THD-500-B]

Protection tube : L=200mm (standard specification)

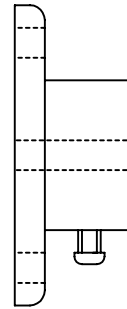
It can be extended by 100mm each time when manufactured.

Mounting method: Fixed by the compression fitting (CT) [Fig. 5.2-1]

Fixed by Loose flange (LF) [Fig. 5.2-2]



[Fig. 5.2-1]



[Fig. 5.2-2]

[For THD-500-V]

Protection tube: L=125mm (standard specification)

It can be extended by 50mm each time when manufactured.

[Common connection wire (L)

Length of the connection wire (unit: m)

The connection wire has been connected to the THD-500 when shipped, and it can be extended by one meter each time.

[Example]

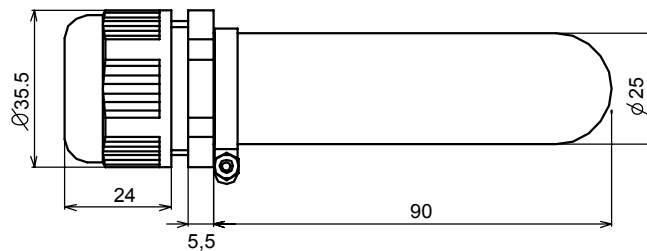
Option code [L5]: 5m length of connection wire is connected to the THD-500 when shipped.

[Waterproof filter]

Model name: THF-500 (Common to THD-500 series)

Material: Fluorine resin (Impermeability of water or dust, and designed not to clog)

External dimension



[Fig. 5.2-3]

5.3 Replacement sensors

Temperature sensor: TD-S (Common to THD-500 series) Compatible, and no need to calibrate after changing

Humidity sensor : HD-S (Common to THD-500 series) Compatible, and no need to calibrate after changing

6. Troubleshooting

In order to keep accuracy, inspect and exchange the sensor part once a year depending on the degree of pollution.

Also make sure that temperature sensor (TD-S) and humidity sensor (HD-S) are securely connected to the socket before checking the items in the following table.

In the case of temperature measurement

Problem	Presumed cause and solution
[- - - -] is blinking on the PV display of the receiving instrument.	<ul style="list-style-type: none"> Is the connection wire connected to the terminals within the THD-500 securely? Connect the wire securely. Is the sensor broken? Exchange the sensor for the new one. Is there imperfect contact to the sensor? When the sensor terminal has rusted, exchange the sensor for the new one. Inquire at our sales office for repair if the contact at socket side has rusted.
[- - - -] is blinking on the PV display of the receiving instrument.	<ul style="list-style-type: none"> Is the connection within the THD-500 (temperature sensor) correct? Connect the wire properly.
An abnormal or unstable value is indicated on the display of receiving instrument.	<ul style="list-style-type: none"> Read the instruction manual (6. Troubleshooting) of the receiving instrument.

In the case of humidity measurement

Problem	Presumed cause and solution
Humidity output is not activated from hygrothermo transmitter THD-500.	<ul style="list-style-type: none"> Is the connection within the THD-500 correct? Connect the THD-500 properly. Is there imperfect contact to the sensor? When the sensor terminal has rusted, exchange the sensor for the new one. Ask our sales office for repair if the contact at socket side has rusted. Is the sensor broken? Exchange the sensor for the new one.
An abnormal value (High humidity) is indicated on the receiving instrument display.	<ul style="list-style-type: none"> Is the sensor wet or damp? Dry the sensor. Are inorganic salt and the like adhered to the sensor? Exchange the sensor for the new one.
An abnormal value (Low humidity) is indicated on the receiving instrument display.	<ul style="list-style-type: none"> Is there dust clinging to the sensor? Exchange the sensor for the new one. Has the sensor deteriorated after repetitively condensing? Exchange the sensor for the new one.
The responsive time of the receiving instrument is very slow.	<ul style="list-style-type: none"> Is the site for the hygrothermo transmitter or wind speed at the measuring site proper? Change the hygrothermo transmitter measuring site to the proper one.

- When condensation occurs, 90%RH or greater output is kept until the condensation of the humidity sensor (HD-S) stops. (This is responsible for the deterioration of the humidity sensor.)
If the troubles occur other than the mentioned above, please inform our sales office or branch office.

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