INSTRUCTION MANUAL

TEMPERATURE AND HUMIDITY TRANSMITTER THT-500-A/R

No.THT51E1 2017.12

Thank you for purchasing our THT-500-A/R, Temperature and Humidity Transmitter (mounted within control panel). This manual contains instructions for the mounting, functions, operations and notes when operating the THT-500-A/R. To prevent accidents arising from the misuse of this transmitter, please ensure the operator receives this manual.

⚠ Caution

- This instrument 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 the warnings, cautions and notices. If they are not observed, serious injury or malfunction may occur.
- Specifications of the THT-500-A/R and the contents of this instruction manual are subject to change without notice.
- Care has been taken to ensure 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 installed within a control panel. If it is not, 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.
- Turn the power supply to the instrument OFF when retightening the terminal or cleaning. Working on or touching the terminal with the power switched ON may result in severe injury or death due to electrical shock.
- Use a soft, dry cloth when cleaning the instrument. (Alcohol based substances may tarnish or deface the unit.)

⚠ 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 protection 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

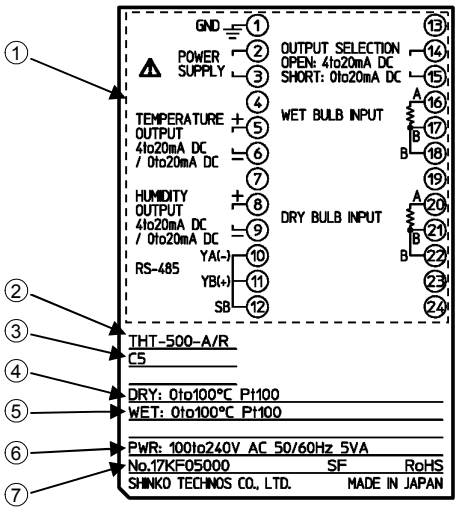
1.1 Model

T H T – 5 0 0 – A / R			□ □	Series name: THT- 500 [48 x 96 x 68 mm (W x H x D)]
Output (*)	A			Temperature output: 0 to 20 mA DC or 4 to 20 mA DC Humidity output: 0 to 20 mA DC or 4 to 20 mA DC
Input		R		Dry bulb input: Pt100, 3-wire, 0 to 100℃ or 0 to 200℃ Wet bulb input: Pt100, 3-wire, 0 to 100℃
Option			C5	Serial communication (RS-485)
			TC	Terminal cover

(*) For the temperature and humidity output, when terminals 14 and 15 are closed, 0 to 20mA DC is output. When terminals 14 and 15 are open, 4 to 20mA DC is output.

1.2 How to Read the Model Label

The model label is attached to the left side of the case.



(Fig. 1.2-1)

No.	Description	Example
①	Terminal arrangement	Terminal arrangement of THT-500-A/R
②	Model	THT-500-A/R
③	Option	C5 (Serial communication)
④	Dry bulb input	0 to 100℃
⑤	Wet bulb input	0 to 100℃
⑥	Power supply Power consumption	100 to 240 V AC 50/60 Hz, 5 VA
⑦	Serial number	17KF05000

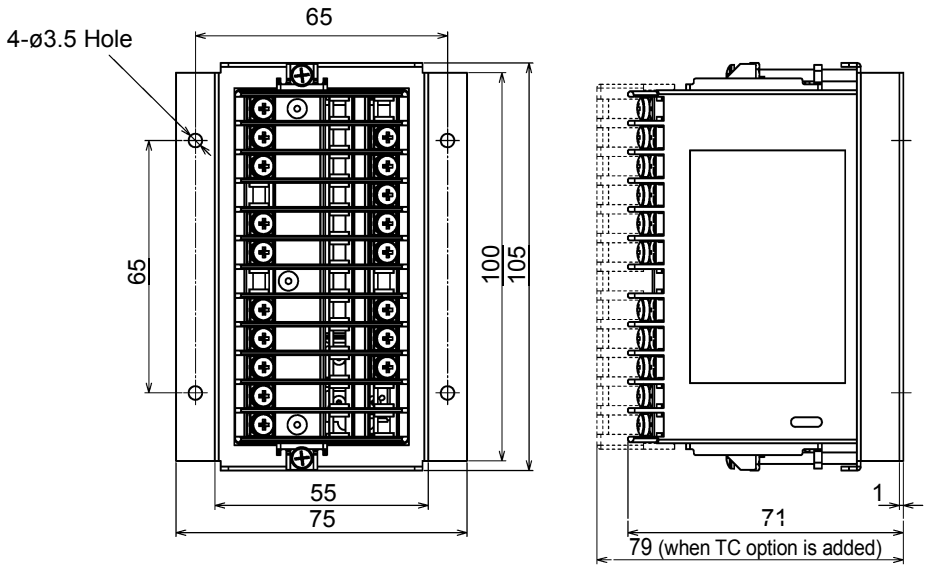
2. Mounting within the Control Panel

2.1 Site Selection

Ensure the mounting location corresponds to the following conditions:

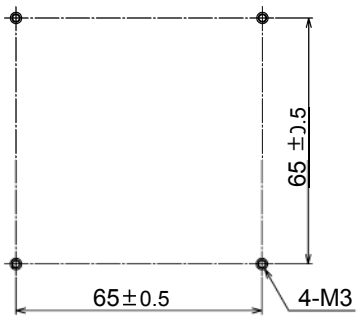
- A minimum of dust, and an absence of corrosive gases
- No flammable, explosive gases
- No mechanical vibrations or shocks
- No exposure to direct sunlight, an ambient temperature of 0 to 50℃ (32 to 122℉) that does not change rapidly, and no icing
- An ambient non-condensing humidity of 35 to 85%RH
  No large capacity electromagnetic switches or cables through which large current is flowing
- No water, oil or chemicals or where the vapors of these substances can come into direct contact with the unit
- Please note that the ambient temperature of this unit – not the ambient temperature of the control panel – must not exceed 50℃ (122℉) if mounted within a control panel, otherwise the life of the electronic components (especially electrolytic capacitors) may be shortened.

2.2 External Dimensions (Scale: mm)



(Fig. 2.2-1)

2.3 Mounting Hole Dimensions (Scale: mm)



(Fig 2.3-1)

3. Wiring

⚠ Warning

Turn the power supply to the instrument OFF before wiring or checking.
Working on or touching the terminal with the power switched ON may result in severe injury or death due to electrical shock.

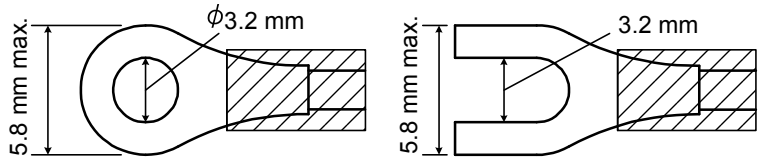
⚠ Caution

- Do not leave wire remnants in the instrument, as they could cause a fire or malfunction.
- Use the solderless terminal with an insulation sleeve in which the M3 screw fits when wiring the instrument.
- The terminal block of this instrument is designed to be wired from the left side. The lead wire must be inserted from the left side of the terminal, and fastened with the terminal screw.
- Tighten the terminal screw using the specified torque. If excessive force is applied to the screw when tightening, the terminal screw or case may be damaged.
- Do not pull or bend the lead wire on the terminal side when wiring or after wiring, as it could cause malfunction.
- This instrument does not have a built-in power switch, circuit breaker and fuse.
  It is necessary to install a-power switch, circuit breaker and fuse near the instrument.
  (Recommended fuse: Time-lag fuse, rated voltage 250 V AC, rated current 2 A)
- Do not apply a commercial power source to the sensor which is connected to the input terminal nor allow the power source to come into contact with the sensor.
- Use the 3-wire RTD according to the sensor input specifications of this instrument.
- When wiring, keep input wires (RTD) away from AC power sources or load wires.

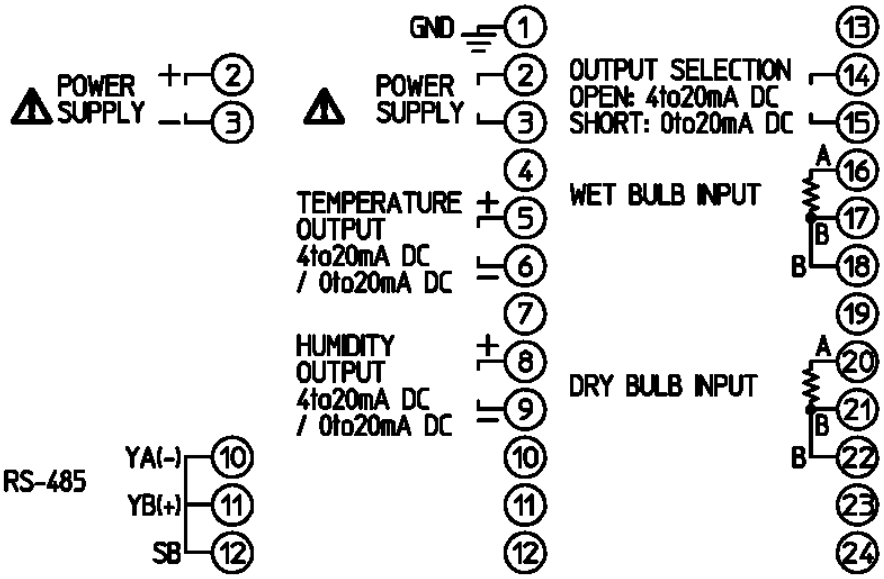
● **Lead Wire Solderless Terminal**

Use a solderless terminal with an insulation sleeve in which an M3 screw fits as shown below.
The torque should be 0.63 N•m.

Solderless Terminal	Manufacturer	Model	Tightening Torque
Y-type	Nichifu Terminal Industries Co., Ltd.	TMEV1.25Y-3	0.63 N•m
	Japan Solderless Terminal MFG Co., Ltd.	VD1.25-B3A	
Ring-type	Nichifu Terminal Industries Co., Ltd.	TMEV1.25-3	
	Japan Solderless Terminal MFG Co., Ltd.	V1.25-3	



(Fig. 3-1)



(Fig. 3-2)

GND:	Ground terminal
POWER SUPPLY:	Power supply terminals
TEMPERATURE OUTPUT:	Temperature output terminals
HUMIDITY OUTPUT:	Humidity output terminals
RS-485:	Serial communication RS-485 (C5 option)
OUTPUT SELECTION (*):	Output selection terminals for 4 to 20 mA DC or 0 to 20 mA DC
WET BULB INPUT:	Wet bulb RTD input terminals
DRY BULB INPUT:	Dry bulb RTD input terminals

(*) When terminals 14 and 15 are closed, 0 to 20 mA DC is output for both temperature and humidity output.

When terminals 14 and 15 are open, 4 to 20 mA DC is output for both temperature and humidity output.

If only wet bulb RTD is connected, no output will occur from humidity output terminals 8 and 9.
If only dry bulb RTD is connected, 4 to 20 mA DC or 0 to 20 mA DC (corresponding to 0 to 100℃) will be output from temperature output terminals 5 and 6.

4. Operation

4.1 Selecting Temperature Output or Humidity Output

For temperature and humidity output, 0 to 20 mA DC or 4 to 20 mA DC can be selected by closing or opening terminals 14 and 15.

When terminals 14 and 15 are closed: 0 to 20 mA DC is output for temperature and humidity output.
When terminals 14 and 15 are open: 4 to 20 mA DC is output for temperature and humidity output.

4.2 Operation

Check Sections “2. Mounting within the Control Panel” and “3. Wiring”.
After the power is turned ON, 0 mA DC is output for approximately 3 seconds regardless of the output type for temperature and humidity output.

Temperature output

Outputs 0 to 20 mA DC or 4 to 20 mA DC for the dry bulb input temperature 0 to 100℃ or 0 to 200℃.

Humidity output

Calculates the relative humidity corresponding to a dry bulb input temperature 0 to 100℃ and wet bulb input temperature 0 to 100℃, and outputs 0 to 20 mA DC or 4 to 20 mA DC corresponding to the humidity 0 to100 %RH.

4.3 Input Error

If a dry bulb input error or wet bulb input error occurs, the following will be output.

Dry bulb input error

Dry Bulb Input	Temperature Output
Short circuit	Low limit value (*)
Low limit error (Less than -25℃)	Low limit value (*)
High limit error (Exceeding 225℃)	Low limit value (*)
Burnout	Low limit value (*)

(*): 0 mA (0 to 20 mA DC) or 4 mA (4 to 20 mA DC)

Wet bulb input error

Wet Bulb Input	Humidity Output (*1)
Short circuit	Low limit value (*2)
Low limit error (Less than -25℃)	Low limit value (*2)
High limit error (Exceeding 100℃)	High limit value (*3)
Burnout	High limit value (*3)

(*1) If dry bulb input exceeds 100℃, the high limit value will be forced to output for humidity output.
(*2) 0 mA (0 to 20 mA DC) or 4 mA (4 to 20 mA DC)
(*3) 20 mA

5. Specifications

Model Name

Name	Temperature humidity transmitter
Model	THT-500-A/R

Rating

Input	**Dry bulb input**	RTD Pt100, 3-wire (0 to 100℃) Allowable input lead wire resistance: 10 Ω max. per wire
		RTD Pt100 3-wire (0 to 200℃)(Humidity calculation range: 0 to 100℃) Allowable input lead wire resistance: 10 Ω max. per wire
	Wet bulb input	RTD Pt100 3-wire (0 to 100℃) Allowable input lead wire resistance: 10 Ω max. per wire
Power supply		100 to 240 V AC 50/60 Hz or 24 V AC/DC 50/60 Hz
		Allowable voltage fluctuation range: 100 to 240 V AC: 85 to 264 V AC 24 V AC/DC: 20 to 28 V AC/DC
Output	**Temperature output**	Outputs 0 to 20 mA DC or 4 to 20 mA DC corresponding to the dry bulb input temperature of 0 to 100℃ or 0 to 200℃. Load resistance: Max. 550 Ω
	Humidity output	Calculates the relative humidity corresponding to a dry bulb input temperature 0 to 100℃ and wet bulb input temperature 0 to 100℃, and outputs 0 to 20 mA DC or 4 to 20 mA DC corresponding to the humidity 0 to100 %RH. Load resistance: Max. 550 Ω

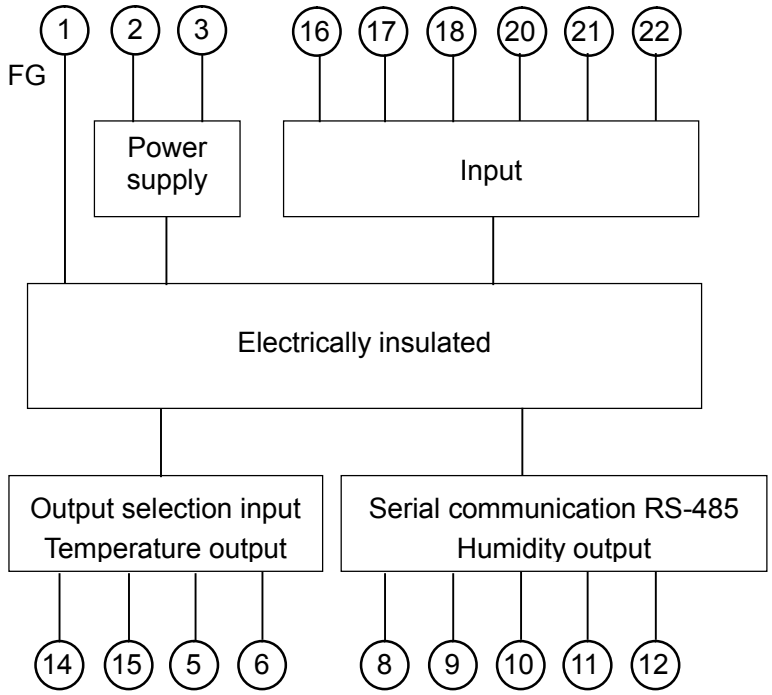
General Structure

External dimensions	48 x 96 x 68 mm (W x H x D)
Mounting	Mounting by the frame using screws (3 mm screw for 4 positions)
Case	Flame-resistant resin (Color: Light gray)
Mounting frame	Steel plate (SPCC)(Ni plating finish)

Performance

Conversion accuracy	**Temperature output**	Within converted temperature ±1.0℃
	Humidity output	Within ±3% of full scale
Input sampling period		250 ms
Output resolution		12000

Insulation, Dielectric Strength

Insulation circuit configuration	
Dielectric strength	Between input terminal and ground terminal, 1.5kV AC for 1 minute Between input terminal and power terminal, 1.5kV AC for 1 minute Between power terminal and ground terminal, 1.5kV AC for 1 minute Between output terminal and ground terminal, 1.5kV AC for 1 minute Between output terminal and power terminal, 1.5kV AC for 1 minute

Other

Power consumption	Approx. 5 VA
Ambient temperature	0 to 50℃
Ambient humidity	35 to 85 %RH (non-condensing)
Weight	Approx. 200 g
Accessories	Instruction manual: 1 copy Terminal cover: 1 piece (TC option)

SHINKO TECHNOS CO., LTD.

OVERSEAS DIVISION

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