

TH71A/T71A/H71A Series Temperature-Humidity/Temperature/Humidity Sensor Instruction Manual

Preface

Thank you for purchasing a Shimaden TH71A/T71A/H71A Series sensor.
Please read the instructions carefully and get a good understanding of the contents before attempting to operate this equipment.
The instruction manual should be kept in a handy place where the end user can refer to it when necessary.

⚠ WARNING

TH71A/T71A/H71A Series is designed to measure the temperature/humidity of general and industrial purpose air conditioning.
You should either take appropriate safety measures or avoid using this product for applications that could have a serious effect on human life and/or safety.
The manufacturer shall not be liable for an accident that results if this product is used without taking appropriate safety measures.

1. Specifications

<p>■ Humidity</p> <p>Humidity sensing element: Macromolecule humidity sensor</p> <p>Operating ambient temperature range: 0 – 50°C</p> <p>Humidity measuring range: 0 – 100% RH max. (no dew condensation) (practical range 20 – 90% RH)</p> <p>Measuring accuracy: ±3% RH (20 – 90% RH/at 25°C)</p> <p>Temperature coefficient: ±0.1% RH/°C at 25°C</p> <p>Humidity output signal: See code selection table.</p>	<p>■ General specifications</p> <p>Power supply: TH71A/H71A: 24 V DC±10% TH71A/Approx. 3 mA:</p> <p>Current consumption: When temperature = resistance output and humidity = voltage output Approx. 6 mA: When both temperature and humidity is voltage output Approx. 22 mA: When temperature = resistance output and humidity = current output TH71A/Approx. 3 mA: With voltage output Approx. 22 mA: With current output</p>	<p>Storage temperature: -10 – 60°C</p> <p>Insulation between terminal and case: 500 V DC 20MΩ</p> <p>Material: ABS resin (case)</p> <p>Color/cover: Ivory</p> <p>Base: Ivory</p> <p>External dimensions: H70×W110×D42 mm</p> <p>Mounting method: Wall mounting</p> <p>Mounting measurement: 86.5 mm extendable screw M4×2 (See External dimensions for details)</p> <p>Weight: TH71A: Approx. 150 g T71A: Approx. 100 g H71A: Approx. 150 g</p>
<p>■ Temperature</p> <p>Temperature sensing element: Platinum R.T.D. Pt100 (Applicable for TH71A/T71A) Class A 1 mA (Applicable for T71A) Class B 1 mA (Applicable for TH71A/T71A)</p> <p>Temperature measuring range: 0 – 50°C (Applicable only for TH71A) -10 – 100°C (Applicable only for T71A)</p> <p>Input/output signal wire: Max. 300 m (when using 0.75 mm²) (Applicable for TH71A/H71A) Excludes the case where temperature output signal is resistance output.</p>		

Note) Please do not use in an environment where the following gases are present.

1. Organic gas: Alcohol, Glycol, Carboxylic acid, Ketone, Aldehyde, etc.
2. Inorganic gas: Sulfur dioxide, Hydrochloric and Ammonia
3. Salty gas

2. Code selection table

Item	Code	Specifications
1. Series	TH71A-	Temperature/humidity sensor (Sensing element self-contained type)
2. Humidity output signal	1	0 – 10 mV DC/0 – 100% RH Output resistance: 10Ω (linearized output)
	2	0 – 100 mV DC/0 – 100% RH Output resistance: 100Ω (linearized output)
	3	0 – 1 V DC/0 – 100% RH Output resistance: 1kΩ (linearized output)
	6	4 – 20 mA DC/0 – 100% RH Load resistance: 600Ω max. * 8 (Pt100) must be selected for temperature output signal.
	9	Others
3. Temperature output signal	1	0 – 5 mV DC/0 – 50°C Output resistance: 10Ω (linearized output)
	2	0 – 50 mV DC/0 – 50°C Output resistance: 100Ω (linearized output)
	3	0 – 0.5 V DC/0 – 50°C Output resistance: 1kΩ (linearized output)
	8	Pt100 (three lead wire output) Class B 1mA
	9	Others
4. Mounting directions (Faceplate direction only)	1	Horizontal direction
	2	Vertical direction
5. Remarks	0	Without
	9	With

Item	Code	Specifications
1. Series	T71A-	Temperature sensor (Sensing element self-contained type)
2. Number of elements	1	1
	2	2
3. R.T.D. elements	F	Pt100
4. Class	S	Class B, 1 mA
	Q	Class A, 1 mA
	X	Others
5. Mounting directions (Faceplate direction only)	1	Horizontal
	2	Vertical
6. Remarks	0	Without
	9	With

Item	Code	Specifications
1. Series	H71A-	Humidity sensor
2. Type of humidity sensor	1	Self-contained type
	2	Probe type (with lead wire 1.5 m)
3. Humidity output signal	1	0 – 10 mV DC/0 – 100% RH Output resistance: 10Ω(linearized output)
	2	0 – 100 mV DC/0 – 100% RH Output resistance: 100Ω(linearized output)
	3	0 – 1 V DC/0 – 100% RH Output resistance: 1kΩ (linearized output)
	6	4 – 20 mA DC/0 – 100% RH Output resistance: 600Ω max.
	9	Others (Please consult before ordering.)
4. Mounting directions (Faceplate direction only)	1	Horizontal direction
	2	Vertical direction
5. Remarks	0	Without
	9	With (Please consult before ordering.)

* Supplementary explanation

This product utilizes the behavior of platinum (Pt) whose electric resistance increases in proportion to temperature. Currently, JIS (C1604-1997) designated Pt as a new standard and abolished JPt (JIS standard) which is widely used in Japan. However, both standards are generally used at present and Pt and JPt have characteristics different from each other. Therefore, please make sure that type of the standard matches the input specification of a temperature controller.

Standard resistance value table (Extracted from JIS C1604-1997)

(Unit: Ω)

Temperature (°C)	-10	0	10	20	30	40	50	60	70	80	90	100
Pt100	96.09	100.00	103.90	107.79	111.67	115.54	119.40	123.24	127.08	130.90	134.71	138.51
JPt100	96.02	100.00	103.97	107.93	111.88	115.81	119.73	123.64	127.54	131.42	135.30	139.16

Allowable tolerance against temperature

Class	Allowable tolerance (°C)
Class A	± (0.15+0.002 t)
Class B	± (0.3+0.005 t)

Class	Temperature (°C)		
	0	50	100
Class A	±0.15	±0.25	±0.35
Class B	±0.3	±0.55	±0.8

* |t| is the value (absolute value) displayed as temperature (°C) which has no relations with + or – symbols.

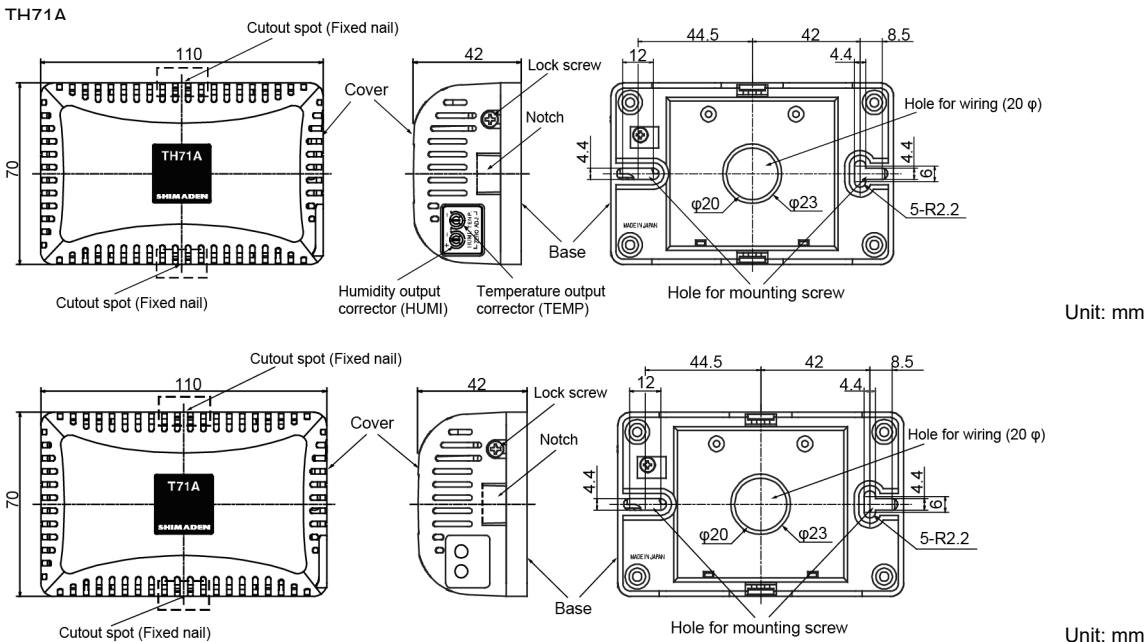
3. Mounting place

CAUTION

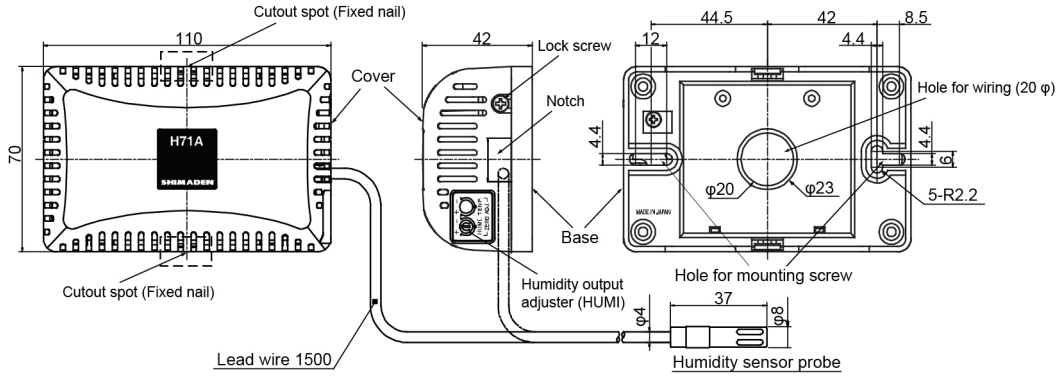
Since the mounting place has a great influence on the measuring result, please be careful in selection of the mounting place.

1. Please mount in a place where the natural circulation of air is not restricted.
2. A wall surface approximately 1.5 m above a floor is appropriate in order to measure average temperature and humidity inside a room.
3. Please avoid places where temperature and humidity change considerably, places near windows or doors, and places affected by drafts and/or radiant heat.
4. Please avoid using near places subject to rain, water, and/or dew condensation.
5. Please install in a clean environment and avoid usage where organic gases, such as methanol, formalin and sulfite gas, are present.
6. Please do not open the packing case until actual usage if possible since the humidity sensor and temperature/humidity sensor are wrapped tightly in an anti-humidity bag with desiccant after adjustment at the factory and are thus maintained in a well-preserved condition.

4. External dimensions and mounting method



H71A



Unit: mm

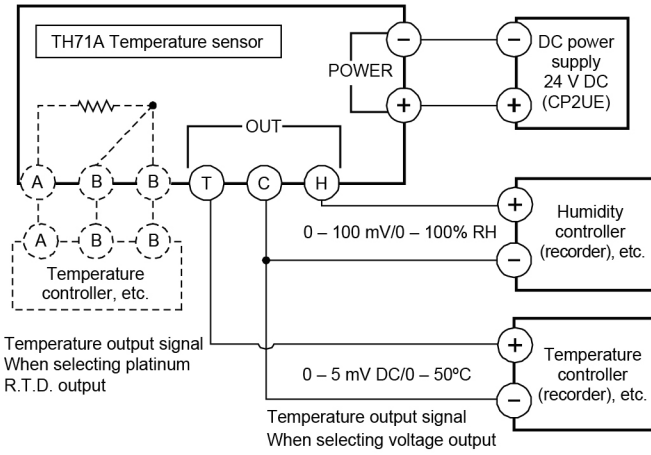
- To separate the cover from the base, please loosen lightly the lock screw (+) at the right side and separate the cover from the base by holding the cutout spot (fixed nail) at the upper and lower center of the cover.

5. Terminal arrangement and wiring example

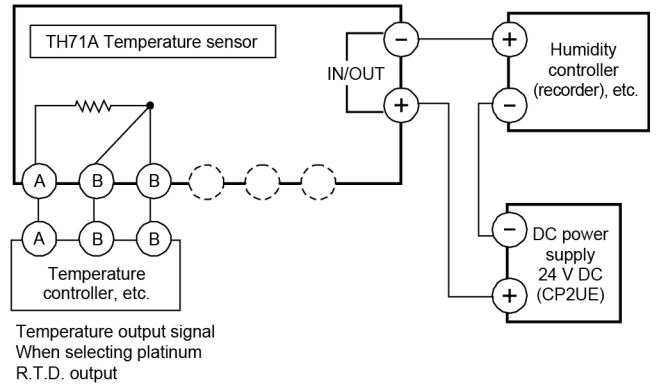
- Please separate the output signal wire from the strong electric circuit or ground the wire by using a shield wire. To extract a wire, please use the wiring hole (20 mm dia.) at the base center or the notch at the left and right sides of the unit. Please use a crimping terminal with a width no wider than 7 mm and applicable to an M3.0 screw.

TH71A

- Output signal
Humidity: Voltage output
Temperature: Voltage or resistance output



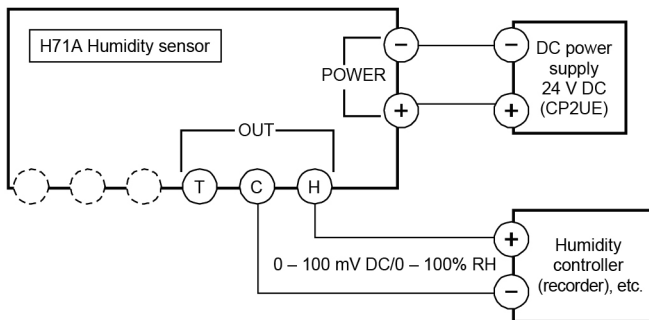
- Output signal
Humidity: Current output
Temperature: Resistance output



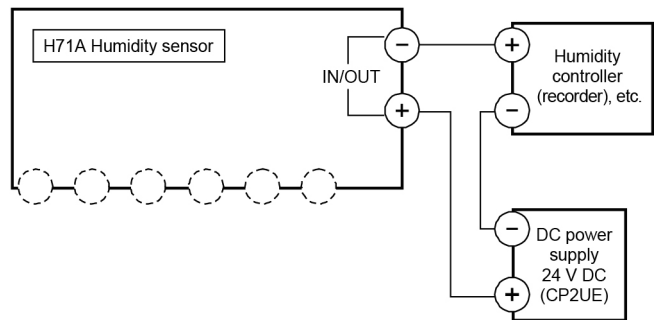
* Temperature output signal is one of the followings:
A, B, B (Resistance output) T, C (Voltage output)

H71A

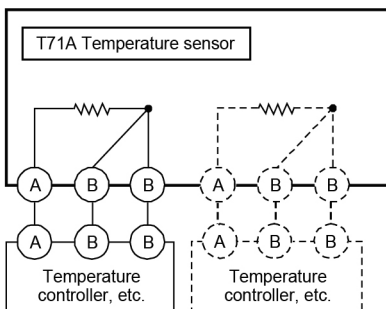
- Output signal
Voltage output



- Output signal
Current output

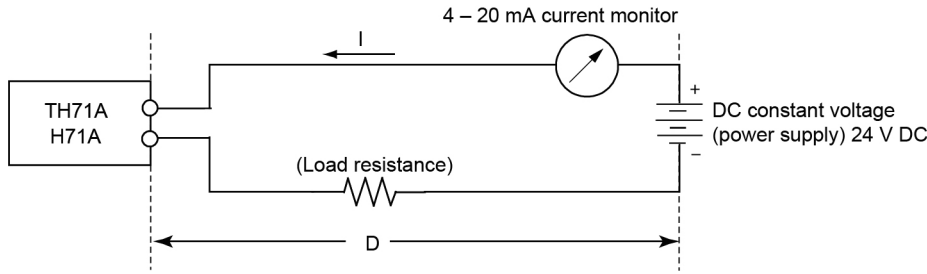


T71A



□Wiring

When operating with a 2-wire loop transmission system, the degree of voltage decline varies in sync with the amount of load resistance. Therefore, please watch the allowable load resistance value (input resistance of a receiving instrument and lead wire resistance value of the connection loop). The power supply voltage of this equipment is 24 V DC, and the max. allowable load resistance is 600Ω.



Lead wire diameter of the wire rod which is used for this equipment is as follows.

- Example) Lead wire diameter 0.5 mm²: 100Ω/km
- 1.25 mm²: 18Ω/km
- 2 mm²: 10Ω/km

* (The above indicates the lead wire resistance value of reciprocating current.)

Note) In case of 4 – 20 mA output, up to five H71A and/or TH71A sensors can be connected to one CP2UE-24 device.

6. Maintenance

1. Humidity accuracy check

If the humidity sensor is used for a long period, a secular distortion will occur. Since the output is expected to decrease gradually, please check the humidity output signal by measuring humidity with a ventilated psychrometer (Asmann hygrometer) or an equivalent hygrometer. At that time, please use the hygrometer correctly and make sure that the humidity sensor is used in consideration of the surrounding environment. In case of a big variation in temperature and humidity, please be aware that the possibility of delay in measurement may occur.

2. Humidity output adjustment

There is no need for adjustment since the humidity output has been corrected at the time of shipment from the factory.

If an error occurs resulting from the accuracy check in the above, please correct in the following manner:

* Adjustment method

Please correct by the Humidity Output Corrector (HUMI) at the right side of the unit. (See 4. External dimensions and mounting method)

In case of low output + direction (clockwise)

In case of high output - direction (counterclockwise)

Adjustment range ±10% RH max.

(Variation almost parallels to all the measuring ranges.)

In case of the error over ±10% RH, please consult your nearest Shimaden agent since a replacement of the humidity sensing part is necessary.

3. Temperature output adjustment (only in the case of TH71A and where a temperature output signal is a voltage output.)

There is no need for adjustment since the temperature output has been corrected at the time of the shipment from the factory and almost no secular distortion occurs concerning the temperature sensing part, compared with the humidity sensing part. However, if the output signal is suspected to be abnormal in comparison with other normal thermometers, please correct in the following manner:

* Adjustment method

Please correct by using the Temperature Output Corrector (TEMP) at the right side of the unit.

In case of low output + direction (clockwise)

In case of high output - direction (counterclockwise)

Adjustment range ±1°C max.

(Variation almost parallels to all the measuring ranges.)

In case of the error being over ±1°C, please consult your nearest Shimaden agent since a replacement of the temperature sensing part is necessary.

In case of equipment failure, please read through the instruction manual again and check the equipment before requesting maintenance service.

If you have problems or questions concerning the equipment, please contact your nearest Shimaden agent.

The contents of this manual are subject to change without notice.

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