

Temperature and humidity controller -TH-E series

Directory



Version number V1.2 Revision date: 2025.05.12

Product Overview	2/10
Order information	2/10
Human-computer interface	3/10
Product technical parameters and implementation standards	4/10
Product terminal definition	5/10
Application wiring schematic diagram	6/10
Product functional logic	7/10
Human-computer interface operation demonstration steps	8/10
Product installation size drawing	9/10

Temperature and humidity controller -TH-E series

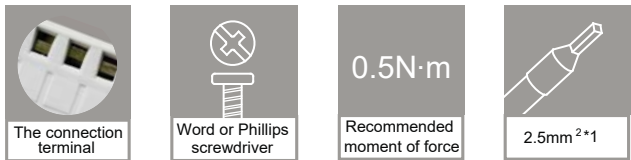
Product Overview



Temperature and humidity controller -TH-E series

Application scenarios and characteristics

- It is used for the occasions where the sensor is external and the load only needs to be connected to the heater and the heater disconnection self-test function is provided (active series).
- Used for sensor external and load only need to connect to heater and fan (passive series)
- The LED displays the temperature and relative humidity in real time
- With disconnection self-test function, you can monitor the working state of the heater in real time (active series)
- With abnormal alarm function, real-time monitoring of product working status
- With temperature mutation (temperature change > 2C in 3s) alarm lock function
- With force button function, easy to debug and operate
- Electromagnetic compatibility (EMC) meets Class IV standards
- Installation size: Embedded installation: 49.4mm(L)X59.4mm(W)X90.3mm(H)
DIN35 Guide rail/fixed: 49.8mm(L)X91.9mm(W) X48mm (H)



Order information

TH-E series product naming rules

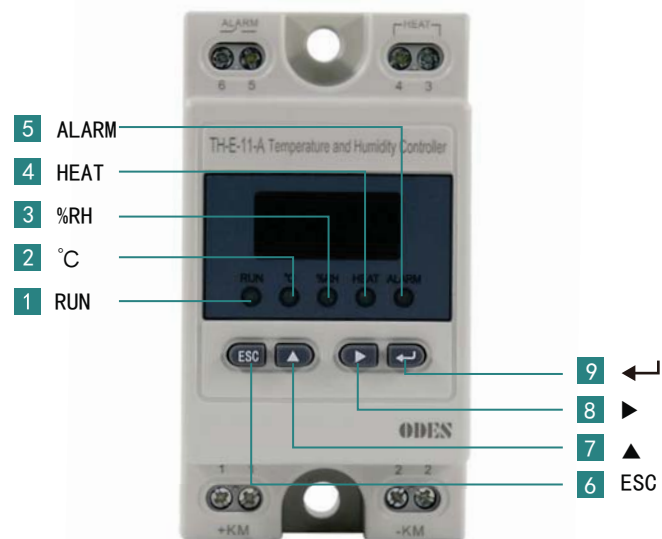
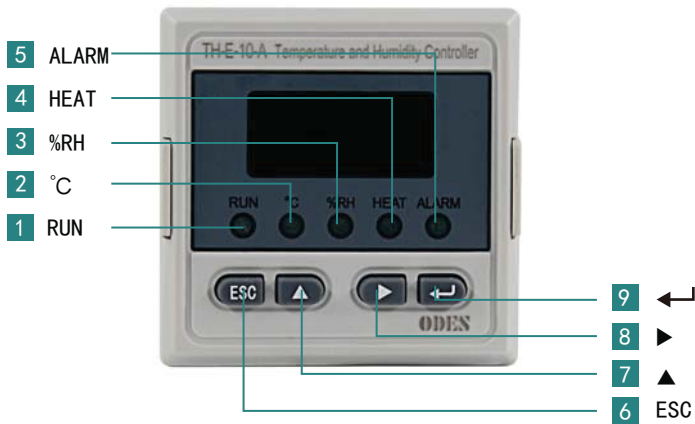
Typical model	TH	-E	-11	-A	/LED
Controller Types TH=T/H controller					
Structure type E=Economic					
Installation method 10 = Embedded installation 11 = Guide rail/fixed installation					
Output type Empty = 1 heater passive output +1 fan passive output A = 1-way heater active output + 1-way abnormal alarm contact 1 = Upgrade terminal definition					
Display mode LED=LED display mode					

TH-E series regular models

Regular model	Sensor	Type of payload	Disconnection self test	Installation method
TH-E-10/LED	One way external	One way heat (passive output) One way fan (passive output)	NO	Embedded installation
TH-E-11/LED	One way external	One way heat (passive output) One way fan (passive output)	NO	Rail/fixed installation
TH-E-10-A/LED	One way external	One way heating (active output) One way abnormal alarm (passive output)	Yes	Embedded installation
TH-E-11-A/LED	One way external	One way heating (active output) One way abnormal alarm (passive output)	Yes	Rail/fixed installation

Temperature and humidity controller -TH-E series

Human-computer interface



	Definition		Notes
Indicator light	1	RUN	Run indicator light, always on, force the button state indicator light flashing
	2	°C	Displays the current temperature value in degrees Celsius
	3	%RH	Displays the current humidity value in %RH
	4	HEAT	The heater action indicator light is on when the heater is turned on and off when the heater is turned off
	5	FAN	Fan action indicator light, the indicator light is on when the fan is turned on, and off when it is turned off
Key press		ALARM	Alarm indicator lights, including abnormal sensor、heater disconnect、temperature and humidity limit、temperature mutation
	7	ESC	The Back or Save button
	8	▲	Select button for 0-9 adjustment of parameters
	9	►	Select button for 0-9 adjustment of parameters
	10	↵	The OK button, used to determine the selected action

Temperature and humidity controller -TH-E series

Product technical parameters and implementation standards

Unless otherwise specified, all data are rated at T=25 °C

Input loop - auxiliary power supply

Rated voltage*1	DC 88~370V,AC 85~265V, 47~ 65HZ
-----------------	---------------------------------

Sensor temperature measurement range

-40°C ~ +70°C, resolution: 0.1°C, accuracy $\pm 0.5^{\circ}\text{C}$ (10~60°C), accuracy $\pm 2^{\circ}\text{C}$ (-40~10°C and 60~70°C)

Sensor humidity measurement range

0 ~ 99.9%RH, resolution: 0.1%RH, accuracy $\pm 3\%\text{RH}$ (30~80%RH), accuracy $\pm 10\%\text{RH}$ (0~30%RH and 80~99.9%RH)

Controller working environment

Temperature -40°C ~ +70°C

Output loop - contact

Heater (NO)	Load: 7A@250VAC(resistive)
Fan (NO)	Load: 7A@250VAC(resistive), fan power $\leq 150\text{W}$
Abnormal alarm (NO)	Load: 7A@250VAC(resistive)

Product power consumption

$\leq 3\text{W}$

Protection requirements

Product protection class	IP20
--------------------------	------

Electromagnetic compatibility

Rf radiation immunity	GB/T 17626.3-2016	Class III, test strength: 10V/m
Radio frequency conducted interference	GB/T 17626.6-2017	Class III, test level: 10V
Electrostatic discharge	GB/T 17626.2-2018	Class IV, air discharge: $\pm 15\text{kV}$ contact discharge: $\pm 8\text{kV}$
Electrical fast transients	GB/T 17626.4-2018	Class IV, experimental level: $\pm 4\text{kV}$ (power supply)
Surge (shock)	GB/T 17626.5-2008	Class IV, common mode: $\pm 4\text{kV}$ differential mode: $\pm 2\text{kV}$

Isolation parameter

Resistance of insulation	GB/T14598.3-2006	Working power - Housing: $> 20\text{M}\Omega$
Dielectric strength	GB/T14598.3-2006	$> 60\text{V}$ circuit: AC,2kV,1min leakage current $\leq 5\text{mA}$ $\leq 60\text{V}$ circuit: AC,0.5kV,1min leakage current $\leq 5\text{mA}$
Voltage of impulse	GB/T14598.3-2006	$> 60\text{V}$ loop: 1.2/50us,5kV, three times, $\leq 60\text{V}$ loop: 1.2/50us,1kV, three times

Environmental data

Ambient temperature	Work/storage	-40°C~+70°C/-40°C~+70°C
Maximum operating humidity	93%RH+40°C	

Flame retardant

Flame retardant grade	UL94V-0 grade flame retardant (750°C, 30s)
-----------------------	--

Note : 1、When the voltage of the auxiliary power supply exceeds the specified range of the rated voltage, it's easy to damage the product.
2、The sensor should be placed inside the cabinet and kept away from corrosive gases, chemical solvents, dust, and highly acidic or alkaline environments to prevent damage to sensor components or data distortion。

Temperature and humidity controller -TH-E series

Product terminal definition

FAN		HEAT	
6	5	4	3
			
1		2	
L/+KM		N/-KM	

TH-E-11/-1

6	5	4	3	2	1
				-KM	+KM
FAN		HEAT			

TH-E-10

Port Definition Description

- 1-2: Power supply: DC 88 ~ 370V or AC 85 ~ 265V
- 3-4: Heater (passive output)
- 5-6: Fan (passive output)

ALARM		HEAT	
6	5	4	3
		Active power	
1		2	
L/+KM		N/-KM	

TH-E-11-A

6	5	4	3	2	1
		Active power		-KM	+KM
ALARM		HEAT			

TH-E-10-A

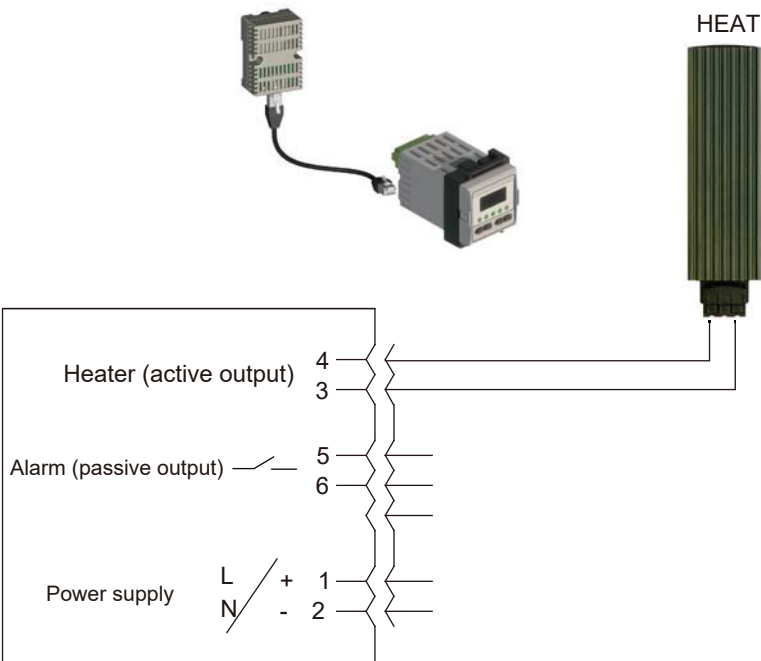
Port Definition Description

- 1-2: Power supply: DC 88 ~ 370V or AC 85 ~ 265V
- 3-4: Heater (active output)
- 5-6: Abnormal alarm contact

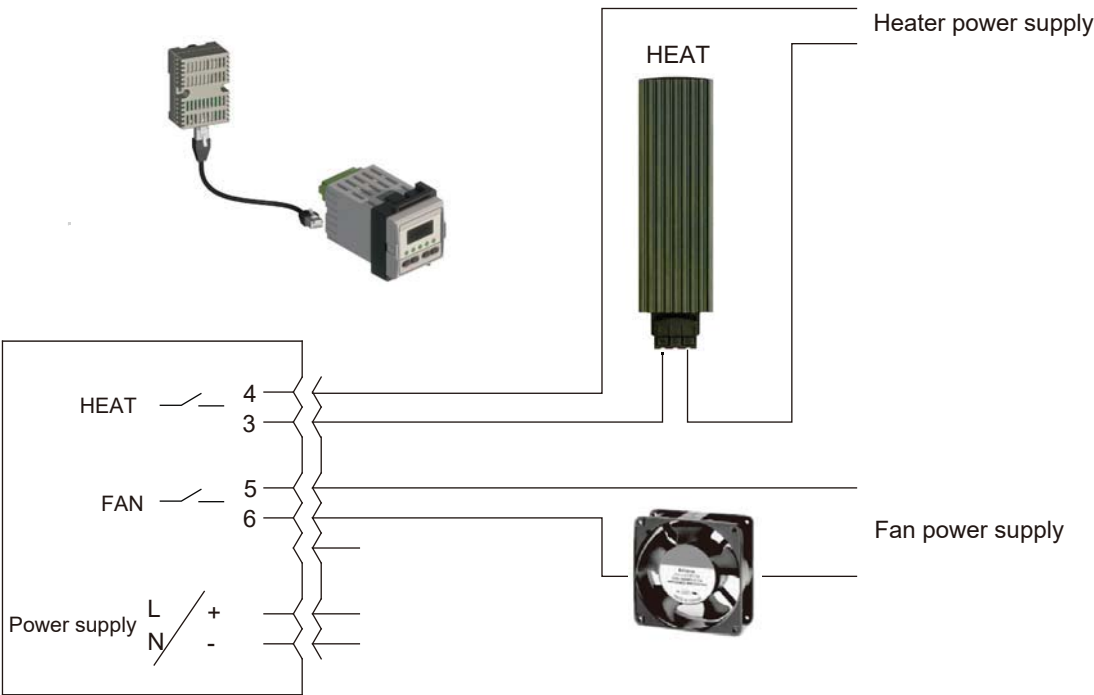
Temperature and humidity controller -TH-E series

Application wiring schematic diagram

Principle wiring diagram of TH-E-10&11-A/LED



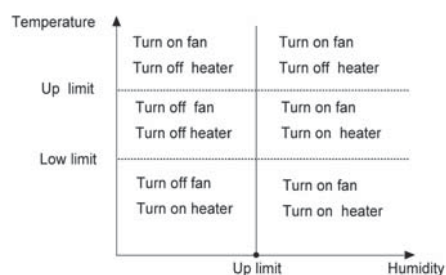
Principle wiring diagram of TH-E-10&11/LED



Temperature and humidity controller -TH-E series

Product functional logic

1.Functional control logic



(1)When measured value of temperature<low-limited value of temperature, or measured value of humidity>up-limited value of humidity also measured value of temperature<up-limited value of temperature - up-limited returning difference of temperature, turn on heater.

2)When measured value of temperature>low-limited value of temperature + low-limited returning difference of temperature, or measured value of humidity < up-limited value of humidity - returning difference of humidity, turn off heater.

(3)When measured value of temperature > up-limited value of temperature , or measured value of humidity > up-limited value of humidity, turn on fan.

(4)When measured value of temperature < up-limited value of temperature - up-limited returning difference of temperature, or measured value of humidity < up-limited value of humidity - returning difference of humidity, turn off fan.

(5)When turn on and turn off fan at the same time, turn on fan.

(6)When turn on and turn off heater at the same time , when measured value of temperature <(up-limited value of temperature - up-limited returning difference of temperature), turn on heater; when measured value of temperature >(up-limited value of temperature - up-limited returning difference of temperature + 0.4℃), turn off heater.

2.Force button function

"▲" and "▶" "It has a reuse function

When the temperature and humidity are displayed normally, if you press the start button ▶ and wait for 3s, "SUCC" appears, the controller does not control the contact between the heater and the fan in an automatic way.

Immediately and unconditionally turn on the heater and fan contacts. When the temperature reaches the upper limit, the heater contacts automatically open. In this condition, no parameter setting is required.

If you press the stop button ▲ and wait for 3s, and "SUCC" is displayed, the controller automatically controls the closing and disconnecting of the heater and fan. The parameters can be set.

Parameter setting: See the HMI operation demonstration of the T/H controller.

3. High priority exception logic

5.1 When the sensor of the action reference is abnormal or the temperature is abrupt (the temperature continues to rise more than 2℃ in 3s and the temperature does not decrease in the following 5s), all action contacts (heater vs Fan contact) is disconnected, over-limit contact is disconnected, abnormal contact is closed.

5.2 When the EEPROM is faulty, the abnormal contact is closed and all other contacts are disconnected.

4.Parameter setting rules

4. 1	Control the temperature setting range	-30℃~+70℃, upper limit value ≥ lower limit value +10℃
		Default value: Upper limit 40℃, lower limit 5℃
4. 2	Control humidity setting range	20%RH to 99.9%RH The upper limit is available
		Default value: Humidity Upper limit 85%RH
4. 3	Alarm temperature setting range	-30℃~+70℃, alarm upper limit ≥ alarm lower limit +10℃
		Default value: upper limit 55℃, lower limit 0℃
4. 4	Alarm humidity setting range	20%RH to 99.9%RH, Only the upper set point
		Default value: 90%RH
4. 5	Temperature return difference setting	The temperature control returns a difference within 1℃~20℃
		The upper default value has a return difference of 10℃, the lower default value has a return difference of 10℃
4. 6	Humidity return difference setting	The temperature control returns a difference within 5%RH~20%RH
		Default value: 10%RH
4. 7	Control set limits	Temperature upper limit - temperature upper limit return difference ≥ temperature lower limit + temperature lower limit return difference

Note :1. If each set value exceeds the range, it will not be saved. If the device is in any abnormal state, all abnormal states must be excluded before it can work properly
2. Refer to the company/s website for specific parameter Settings

Temperature and humidity controller -TH-E series

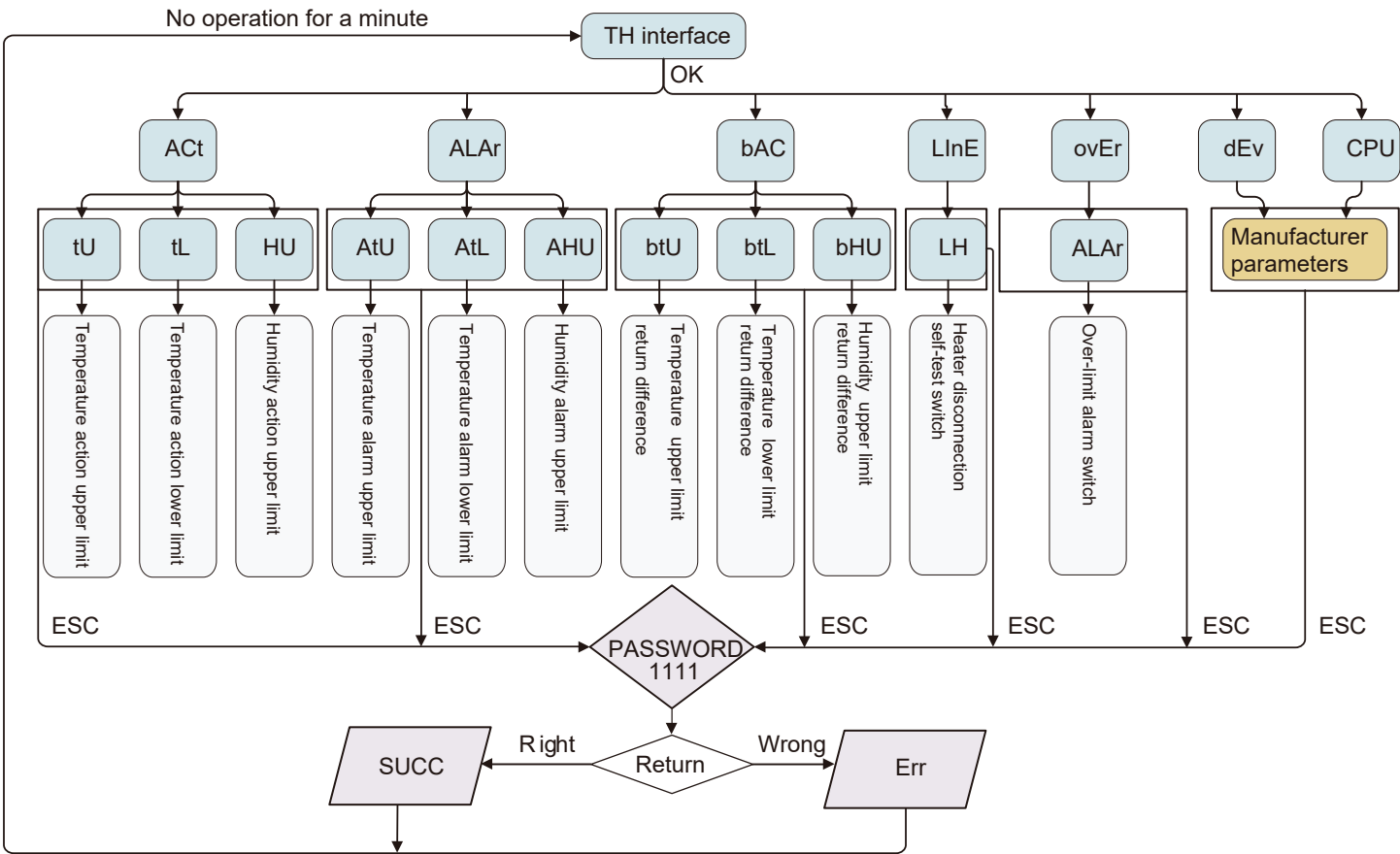
Product functional logic

5. Alarm function

5.1	Display alarm	Sensor exception: Display "Err1"
		EEPROM error: Display"Err3"
		Heater disconnection: Display"Err4"
		Temperature limit alarm: Display "Err6"
		Humidity limit alarm: Display "Err7"
		Temperature change alarm: Display "Err8"
5.2	Contact alarm	abnormal alarm: when the temperature and humidity sensor is abnormal, the heater is disconnected, the temperature and humidity value exceeds the limit, and the temperature is abrupt, the alarm relay is closed

Note: Heater disconnection alarm and abnormal alarm functions are only available for TH-E-10&11-A/LED models

Man-machine interface operation steps

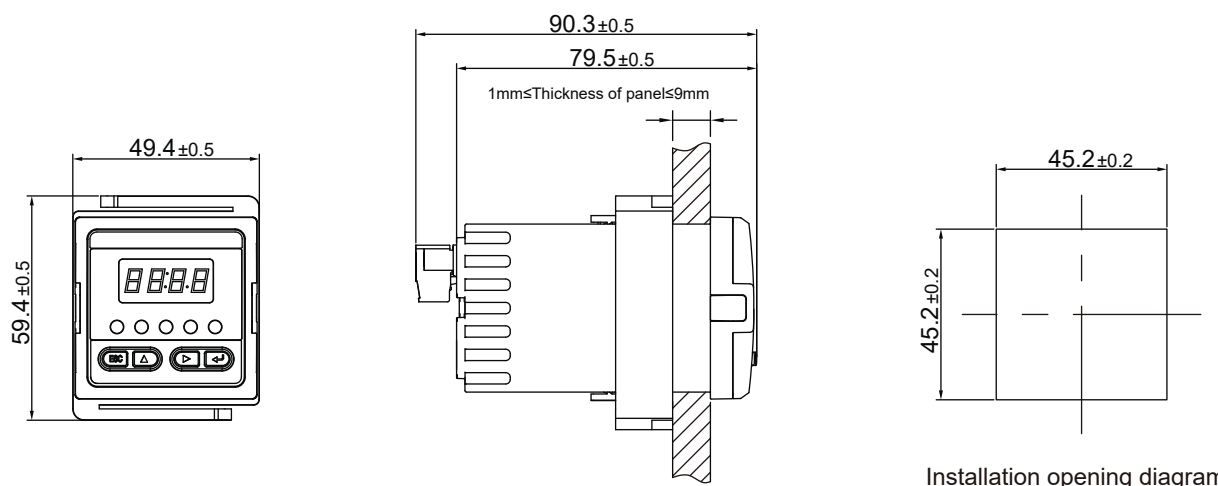


Press "▲" key to select all Settings, press "►" key to shift, press "OK" key to confirm, press "ESC" key to return or save.

- A. Press "OK" to enter the "Device Settings" interface. Select "ACt", press "OK" to enter the specific parameter setting, select "tU", press "OK" to enter, Use "►" to shift, and "▲" to set a specific number so that "tU(temperature limit) = 040.0". After setting, press "OK" to return to the upper menu.
- B. Set "tL(lower temperature limit) = 005.0" and "HU(upper humidity limit) = 70.0" according to the above steps.
- C. After setting, press "ESC" key, and the "0000" interface will appear. Input "1111" to complete the setting.
- D. Enter the "ALAr(Alarm Value)" interface and set the over-limit alarm value.
- E. Enter the "bAc(Return Difference Value)" interface and set the upper and lower limit return difference of actions and the upper and lower limit return difference of out-of-limit alarms.
- F. Enter the "ovEr" interface and select "ALAr" to set the over-limit alarm function on or off. It is on by default.
- G, disconnection self-test function to switch back Settings, press "OK", select "LINE" interface, select "LH(heater disconnection)", press "OK", use "▲" to select "ON" or "OFF", set is good, press "OK" to return to the upper menu.
- H. During the whole setting process, there is no key operation within one minute. The controller does not save the current setting value and automatically exits the setting interface.

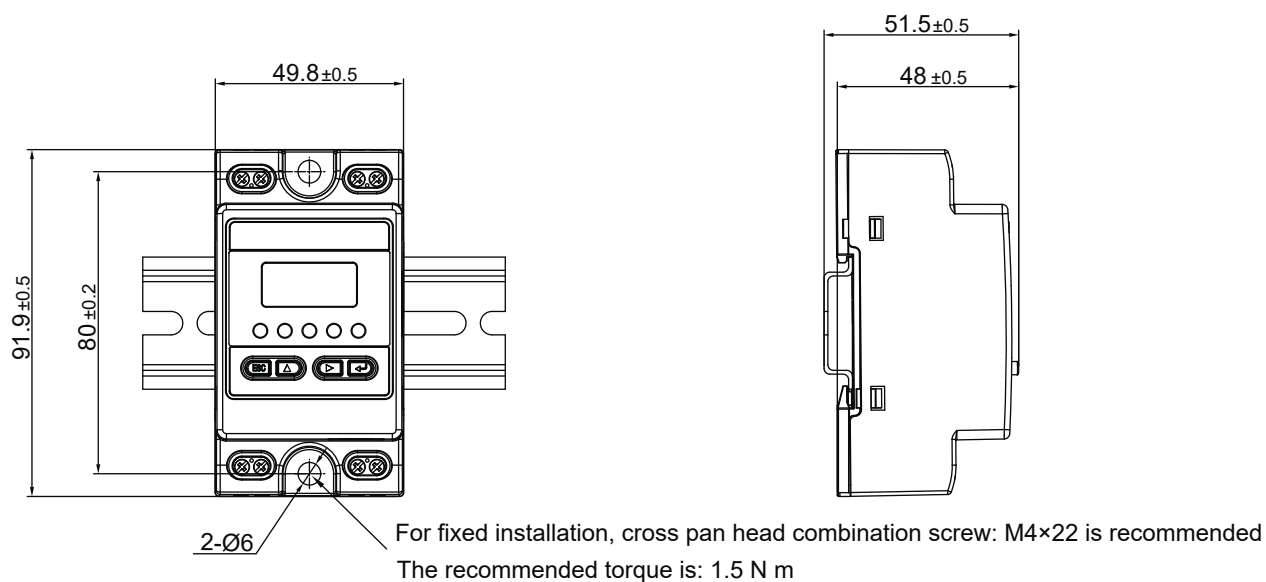
Temperature and humidity controller -TH-E series

Product installation size drawing (mm)



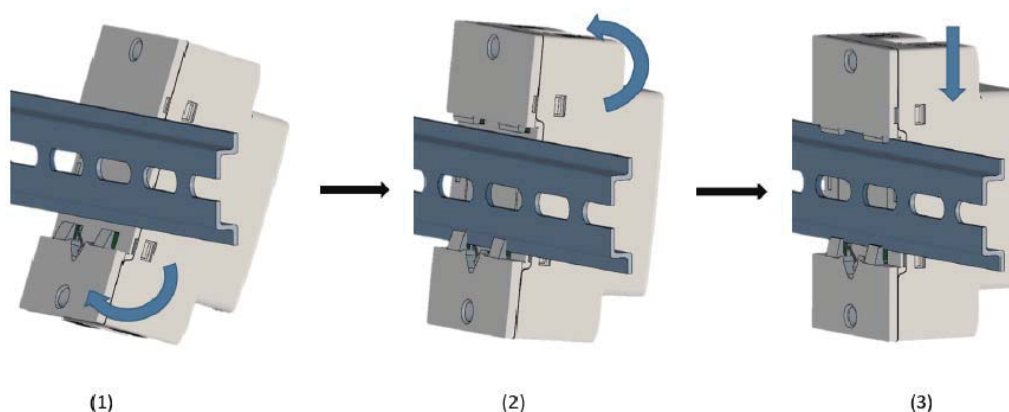
Installation opening diagram

Embedded installation



rail/fixed mount

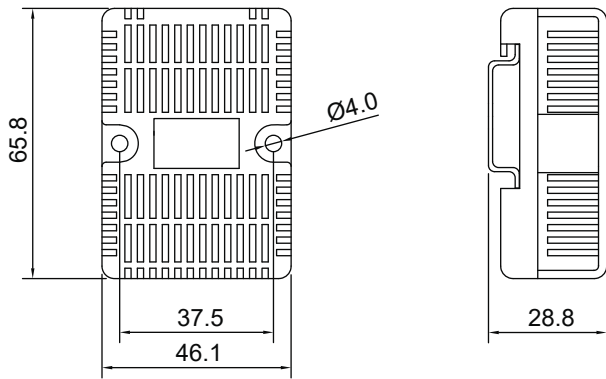
Product Installation Instructions



Temperature and humidity controller -TH-E series

Matching sensor installation size diagram

The sensor is installed by guide rail, and the installation size diagram is as follows:



Sensor wire length: the wire length is 1 m, 3 m, 5 m optional, all are flame retardant wire.