FEATURES

- Standard switch box installation method for easy use.
- Light and beautiful shell design, with LCD backlight to display dual temperature and humidity.
- Using imported high-precision sensors with good long-term stability and anti-interference ability.
- Optional passive temperature output.
- Temperature and humidity offset can be set to facilitate customer on-site operation.
- CE certification, ROSH
- With relay and alarm function

DESCRIPTION

LFH21 Temperature and Humidity Controller is a product specially designed for indoor temperature and humidity detection and control. It has the advantages of compact size, simple installation and convenient operation. It has special design for lightning surge, electrostatic discharge, group pulse, voltage resistance, etc., strong anti-interference ability, and has an alarm function.It is widely used in computer rooms, buildings, warehousing and other places where temperature and humidity measurement and control are required.

SPECIFICATION

1. RELATIVE HUMIDITY

Sensor	Digital
Range	0%~100%RH
Output	RS485 / Modbus, 0~10VDC
Accuracy	±3%@ 20℃ & 20~80%RH
Response time	≤10s (20℃, slow flow air)

2. TEMPERATURE

Sensor	Digital or passive thermal resistor, details in below selection table	
Range	0~50℃, -20~60℃ ETC	
Output	RS485/Modbus, 0~10VDC,	
Thermal resistance	Details in selection table and thermal resistance graduation table	
Accuracy	Digital type: ±0.3℃@20℃; See table below Passive thermal resistance: typical ±0.2~0.4℃@25℃	
Power supply	RS485: 15~35VDC / 24VAC±20%	Voltage: 15~35VDC / 24VAC±20%
	Note: when RS485 and voltage type uses AC power supply, an isolation transformer is required	
Output load	≥10 KΩ(voltage output)	
Display accuracy	0.1℃, 0.1%RH	
Display and buttons	LCD display and keys with unit display and backlight	
Alarm function	1×BUZZER, 1×LED	
Relay	2×SPST, 3A / 30VDC, 3A / 250VAC	
Shell material	PC shell	
Operating environment	-20~60℃, 5%-95%RH(Non-condensing)	
Protection Grade	IP30	

3. DIGITAL SENSOR TEMPERATURE ACCURACY CURVE
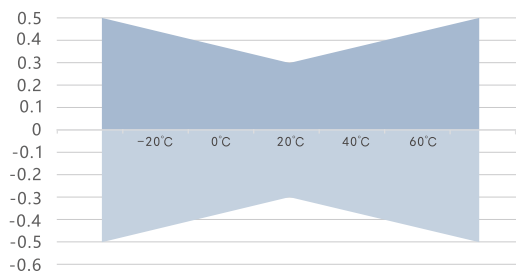
4. SIZE
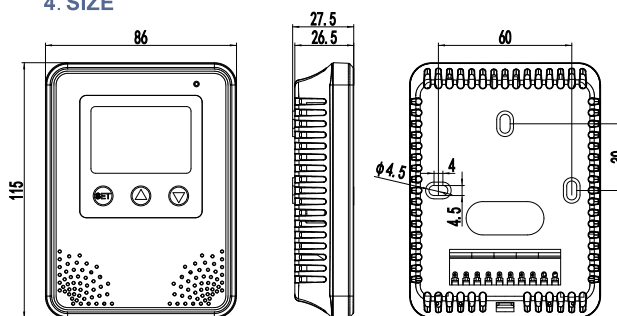
ORDER REF NO.

Code and description							Remark
LFH21	Indoor type temperature and humidity controller						Model
	3	±3%RH (±0.3℃)					Accuracy
		V10	0~10VDC (3-wire)				Humidity output
		RS	RS485/Modbus				
			V10	0~10VDC (3-wire)	2	NTC20K, ±0.4℃@25℃	Temperature output
			RS	RS485 / Modbus	3	NTC10K, ±0.4℃@25℃	
			0	PT1000, ±0.2℃@0℃			
			1	PT100, ±0.2℃@0℃			
				0	No		Temperature range
				1	0~50℃		
				2	-20~60℃		
				8	Customized range		
					1	Setting button, backlight LCD display with unit	Display and setting button
						1	Alarm only	Alarm ans relay
						2	Relay only	
						3	Alarm ans relay	
LFH21	3	V10	V10	2	1	3	Model Example

1. Only when the temperature output option is V10, the temperature range 1-8 needs to be selected accordingly; otherwise, only 0 can be selected.

2. The example LFH21-3V10V10213 represents the indoor type, the accuracy is ±3%RH (±0.3℃), the humidity output is 0-10VDC, the temperature output is 0-10VDC, the temperature is -20~60℃, with display and buttons, and alarm function and relay output;

3. Long-term exposure of the sensor probe of this product to high-concentration chemical gases may cause the sensor readings to shift.

WIRING

B A GND V+
1 2 3 4 5 6 7 8 9 10
485B 485A
RS485 & Relay ▲
POWER
15−35VDC/
24VAC±20%

T RH GND V+
1 2 3 4 5 6 7 8 9 10
0−10V
Voltage & Relay ▲
POWER
15−35VDC/
24VAC±20%

R+ R−
1 2 3 4 5 6 7 8 9 10
Rt
RTD
RT output ▲

INSTALLATIONS

①   ②   ③   ④

⑤   ⑥   ⑦
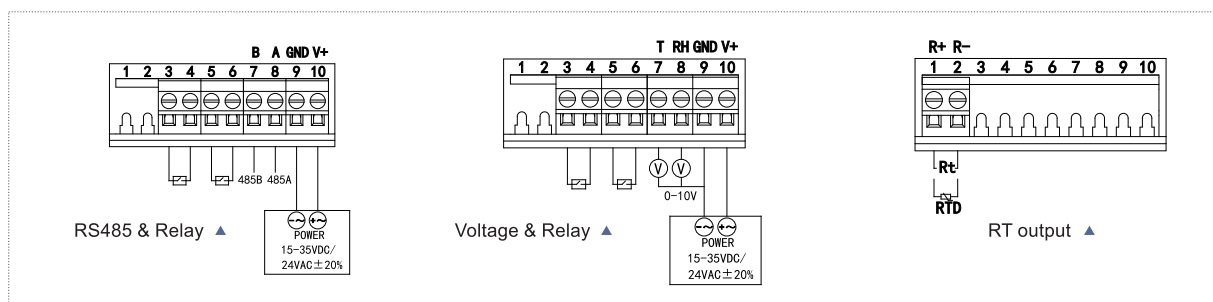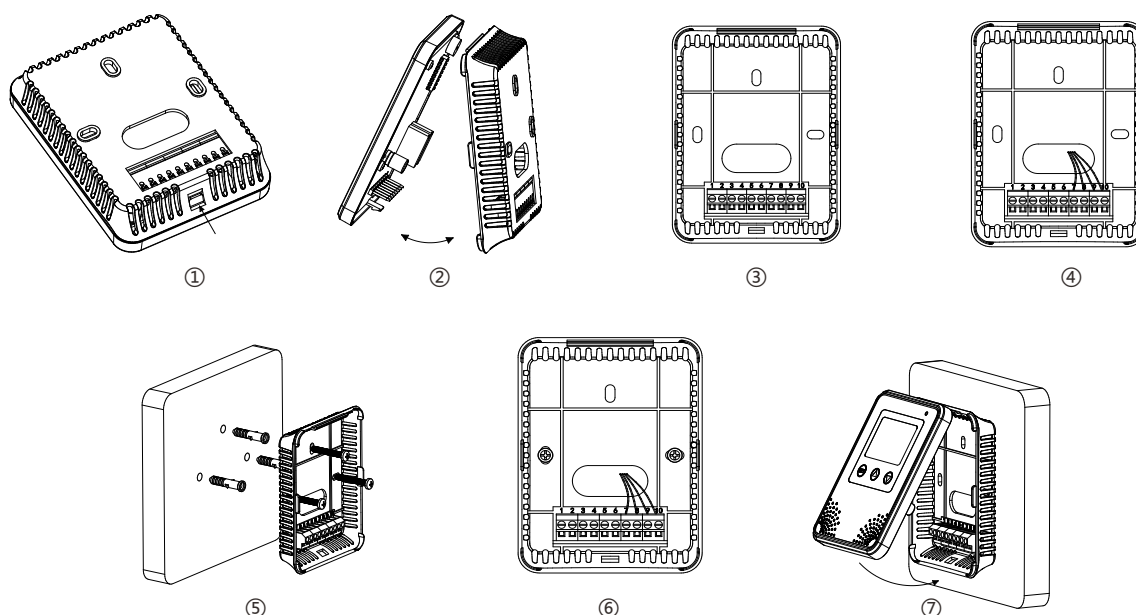
1. Press the cover opening button under the back cover of the controller to open the controller (as shown in Figures 1 and 2);

2. Complete the electrical connection according to the wiring diagram, and introduce the cable through the cablehole (as shown in Figure 4);

3. There are three mounting holes on the back cover of the controller. Use expansion screws to fix it on the wall (as shown in Figure 5). You can also use flat-head screws to fix it on the 86 box embedded in the wall (as shown in Figure 6);

4. Align and fasten the front cover and bottom case to complete the installation (Figure 7).
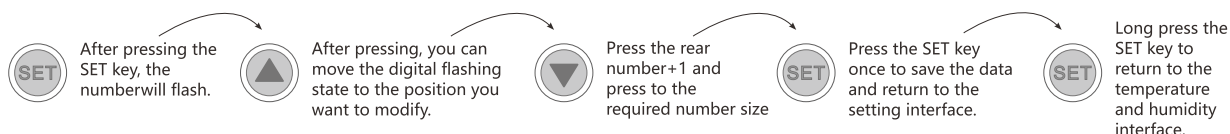
FUNCTION DESCRIPTION

1. BUTTONS

Button	Function	Instructions	Notes
SET	Menu OK	• Press and hold the SET button for 3 seconds to enter parameter settings. • In the parameter setting interface, press the S key once to select the current parameter setting before modifying the parameters. The modifiable parameters will flash on the screen. • Long press this button to return to the main display interface.	The alarm light and buzzer will pause when entering the menu.
▲	Scroll up, shift key	• Press this button to move the flashing state to the next number. • Press this button to select the parameter interface to be modified.	When some parameters exceed the limit, the upper / lower limit is directly displayed.
▼	Scroll down, value increase key	• Press this button to select the parameter interface to be modified. • Press this button, the current parameter to be modified +1. After adding it to 9, press this button again, the current parameter will change to 0, and the previous digit +1. Press this button again, the current parameter will change to 1, and so on.	/

2. DISPLAY

【1】 Slave address setting interface (Addr) --RS485

Long press the SET key to enter the setting interface, adjust to the slave address setting interface, the screen will display "F8 Addr". Short press the SET key and the second line of the screen will flash and display the current slave address. The slave address can be set in the range 1-255, and the default address is 1. The slave address consists of 3 digits. At this time, the digits will flash. After pressing the key ▲ , the flashing state will move to the next digit. When the number is flashing, the number will +1 after pressing the key ▼ . After the slave address modification is completed, press the SET key to save the data, and the display will return to "Addr". If you want to continue to modify other parameters, you can continue to press the ▲ / ▼ key. , select the interface to be modified. If you do not modify other parameters, long press the SET key to return to the data display interface. The modification of other parameters is the same as the modification of the slave address.

| SET After pressing the SET key, the numberwill flash. | ▲ After pressing, you can move the digital flashing state to the position you want to modify. | ▼ Press the rear number+1 and press to the required number size | SET Press the SET key once to save the data and return to the setting interface. | SET Long press the SET key to return to the temperature and humidity interface. |

【2】 Baud rate setting interface (bAud) --RS485

After the display screen enters the setting interface, "F9 bAud" will be displayed on the second line of the screen when adjusting to the baud rate setting interface. Short press the SET key and the second line of the screen flashes to display the current baud rate parameters. There are 4 baud rate options: 1/2/3/4.

▶ 1： corresponding to 1: 9600 (default) ▶ 3： corresponding baud rate: 38400
▶ 2： Corresponding baud rate: 19200 ▶ 4 ： corresponding baud rate: 115200

> The default baud rate is 9600 and the default parameter is 1. Modification of parameters is the same as modification of slave address.

【3】 Temperature range high point setting interface（tr-H）

The display screen enters the setting interface. After adjusting to the high point of the temperature range, the setting interface screen will display "F8 tr-H" (F10 tr-H for the 485 version). Shortly press the SET key and the second line of the screen will flash and display the current high-point parameters of the range. The setting range is -40℃-100℃. The default high-point of the range is 60℃. The modification of parameters is the same as the modification of the slave address.

【4】 Temperature range low point setting interface（tr-L）

The display screen enters the setting interface. When the temperature range is adjusted to the low point of the setting interface, the screen will display "F9 tr-L" (F11 tr-L for the 485 version). Short press the SET key and the second line of the screen will flash and display the current low-point parameter of the range. The setting range must be smaller than the high-point value. The default low-point of the range is -20°C. Parameter modification is the same as that of the slave address.

【5】 Alarm enabling setting interface（ALEn）

Display the screen to enter the setting interface, adjust to the alarm enable setting screen and the second line will display "F10 ALEn" (F12 ALEn for the 485 version). Short press the SET key and the second line of the screen will flash to display the current alarm enable parameters. There are five options for alarm enable settings: OFF/on1/on2/on3/on4.

OFF: Turn off all alarms
on1: Alarm mode 1 on3: Alarm mode 3
on2: Alarm mode 2 on4: Alarm mode 4

The default alarm enable parameter is OFF. The parameter modification method is to control the alarm function switch with the key ▼ and select the alarm mode with the key ▲ . The specific alarm mode is described in the following table:

Alarm mode	Function description	Set parameters 1	Set parameters 2	Functional schematic
1	Alarm below set value	Alarm point	Return difference	Alarm ON — Return difference — Alarm OFF ▲ Setting Point
2	Alarm high set value	Alarm point	Return difference	Alarm OFF — Return difference — Alarm ON Setting Point ▲
3	Alarm within set range	Alarm high point	Alarm low point	Alarm OFF — Alarm ON — Alarm OFF Alarm low point ▲ ▲ Alarm higt point
4	Alarm outside the set range	Alarm high point	Alarm low point	Alarm OFF Alarm ON — — Alarm ON Alarm low point ▲ ▲ Alarm higt point

Note: You need to turn on the alarm function before you can select the alarm mode. The selection of the alarm mode will affect the subsequent alarm high point, hysteresis and other related settings.

【6】 **Temperature unit setting interface（tu）**

The display screen enters the setting interface. When adjusted to the temperature unit setting interface, the screen will display "F1 tu". Short press the SET key and the second line of the screen will flash to display the current temperature unit. The setting range is C/F, which represent Celsius and Fahrenheit temperature units respectively. You can modify parameters by pressing the ▼/▲ key.

【7】 **Humidity alarm high point setting interface (HA)**

The display screen enters the setting interface. When adjusted to the alarm high point setting interface, the screen will display "F2 HA". Shortly press the SET key and the second line of the screen will flash and display the current alarm high point parameters. The setting range is 0-100%. The default alarm high point is 80%RH. The modification of parameters is the same as that of the slave address. The temperature setting screen is "F4 tA". The setting method is the same as that of humidity.

> **Note:** If the alarm high point setting fails, error ERR2 will be reported. The alarm high point setting value must be less than the range high point value

【8】 **Humidity alarm hysteresis setting interface (HH)**

The display screen enters the setting interface, and when adjusted to the alarm/hysteresis low point setting interface, the screen will display "F3 HH". Short press the SET key and the second line of the screen will flash and display the current alarm hysteresis / low point parameters. The setting range is 0-99%. The default range low point is 0%RH. The modification of parameters is the same as that of the slave address. The temperature setting screen is "F5 tH ". The setting method is the same as that of humidity.

> **Note:** If the alarm low point or hysteresis setting fails, an error ERR3 will be reported. The hysteresis value or alarm low point is determined based on the alarm mode set by "ALEn". On1, on2 is the hysteresis value, and on3, on4 is the alarm low point.

【9】 **Humidity offset setting interface (HoFF)**

 The display screen enters the setting interface. When adjusted to the humidity offset setting interface, the screen will display "F7 HoFF". Short press the SET key and the second line of the screen will flash to display the current offset. The setting range is -100-100, and the default value is 0. The modification of parameters is the same as that of the slave address. The temperature setting screen is "F6 toFF. The setting method is the same as that of humidity.

【10】 **Backlight setting interface (bLEn)**

Display the screen to enter the setting interface, adjust to the backlight setting interface and the second line of the screen will display "F14 bLEn" (F16 bLEn for the 485 version). Short press the SET key and the second line of the screen will flash to display the current switch status. Press the ▼ / ▲ key to control the backlight switch.

【11】 **Relay setting interface (r-En)**

The display screen enters the setting interface. When adjusted to the relay setting interface, the second line of the screen will display "F11 r-En (F13 r-En for the 485 version). Shortly press the SET key and the second line of the screen will flash to display the current switch status. Press the ▼ / ▲ key to control the switch of the relay during alarm.

【12】 **Alarm light setting interface (L-En)**

The display screen enters the setting interface. When adjusted to the alarm light setting interface, the second line of the screen will display "F12 L-En (F14 L-En for the 485 version). Shortly press the SET key and the second line of the screen will flash to display the current switch status. Press the ▼ / ▲ key to control the switch of the alarm light during alarm.

【13】 **Buzzer setting interface（b-En）**

Display the screen to enter the setting interface. Adjust to the buzzer setting interface and the second line of the screen will display "F13 b-En (F15 b-En for the 485 version). Short press the SET key and the second line of the screen will flash to display the current switch status. Press the ▼ / ▲ key to control the buzzer switch during alarm.

## 3. CANCEL ALARM FUNCTION DESCRIPTION

When an alarm occurs, press and hold the ▼ / ▲ key on the display interface to cancel the screen flashing, alarm light, and buzzer. Voltage type and 485 type: The temperature and humidity corresponding display numbers on the display screen stop flashing, the housing alarm light goes out, the buzzer does not sound, and the temperature and humidity corresponding relay will turn off when the temperature and humidity leave the alarm range. (Need to turn on the relay, alarm light, and buzzer functions in "r-En", "L-En" and "b-En")

> **Note:** Use this function to cancel the screen flashing and alarm light. After the buzzer, the alarm function can return to normal when the temperature and humidity leave the alarm range or enter the setting interface and return to the temperature and humidity display interface.

4. DIP SWITCH DESCRIPTION

(ON represents 1, OFF represents 0, the numbers 1~8 on the dial panel represent low to high).

- **Type 485:** The first 6 digits of the 8-digit dial code are the address. The address can be set to 1-63. The factory default is set to 1. The 7/8 digits are the baud rate and can be set to 1-3, representing 1:9600 2:19200 3. : The setting method of 38400 is as follows:
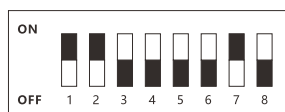
Example: 1*2^0+1*2^1+ 0*2^2+……=3, and the baud rate is 1

- **Voltage type:** 8-digit dial code can select the temperature range. Each dial code represents a temperature range, 1: 0~50℃, 2: 0~60℃, 3: 0~80℃, 4: 0~100℃, 5: -20~60℃, 6: -20~80℃, 7: -40~60℃, 8: -40~80℃.
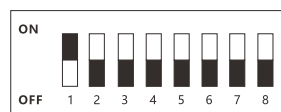
Example: At this time, the temperature range is 0~50℃

> **Note:** All dialing codes must be powered on again for the changes to take effect. For model 485, when the address or baud rate dialing code is 0, it can be changed by software and menu. For voltage type, the dialing codes are all OFF or there are more than two dialing codes. When ON, the temperature range is the default range -20~60℃. Dial-code has the highest priority. When the dial-code is turned on, its corresponding function cannot be modified through software and menus.