

RT226-F4 FAN COIL THERMOSTAT

Application: Cool/Heat, 3 speed fan, Room Card, External Sensor
Installation and operation instructions

SPECIFICATION:

Electrical Rating.....	100~240VAC 50/60HZ
Fan Relay Amps inductive.....	8A
Heat/Cool Relay Amps inductive.....	3A
Accuracy.....	±0.5°C(1 °F)
Set point Temperature Range.....	5°C to 60°C
Dimensions.....	120.9mm×82.9mm×28mm

FEATURES:

- New vertical design, crosswise installation or vertical installation
- Temperature adjustments are simple
- Display shows both set points and room temperature simultaneously
- Maintains the temperature to within 1 degree set point
- Auto fan with adjustable 3-fan speed.
- Permanent user setting retention during power loss, no batteries are required
- External sensor, Remote control
- RS485 communication function

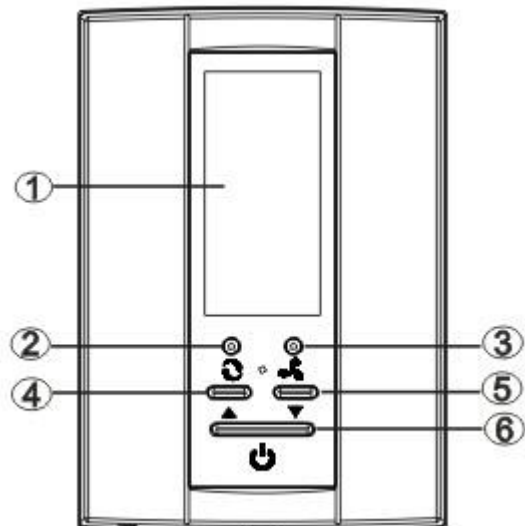
IMPORTANT SAFETY INFORMATION:

- Always turn off power at the main power source by unscrewing fuse or switching circuit breaker to the off position before installing, removing, cleaning, or servicing this thermostat.
- Read all of the information in this manual before installing this thermostat.
- Only a professional contractor should install this thermostat.
- All wiring must conform to local and national building and electrical codes and ordinances.

OPERATION

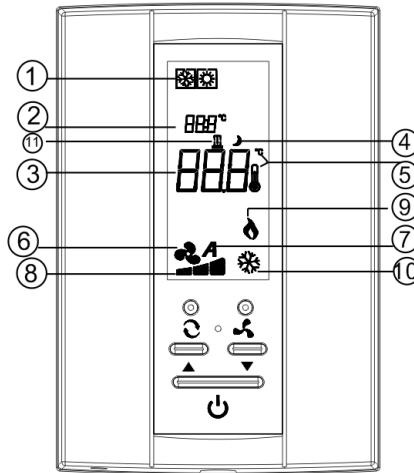
Thermostat Buttons and Switches

- ① Display area
- ② System button (COOL, HEAT)
In switch on state, long press this button for 3 seconds, can start or close sleep mode
In switch off state, long press this button for 3 seconds, can enter to menu setting
- ③ Fan speed option button (HI MED LOW AUTO)
In switch on state, long press this button for 3 seconds, will enter to switch off timer mode;
In switch off state, long press this button for 3 seconds, will enter to switch on timer mode
- ④ Raises temperature setting
- ⑤ Lowers temperature setting
- ⑥ Power button
- ⑦



The Display

- ① Shows working mode
- ② Shows setting temperature
- ③ Shows measure temperature
- ④ Shows sleep mode
- ⑤ Temperature unit mark
- ⑥ Shows fan speed option
- ⑦ Shows fan rotate in Auto speed
- ⑧ Shows fan speed option
- ⑨ Shows heating output
- ⑩ Shows cooling output
- ⑪ Shows room card mode

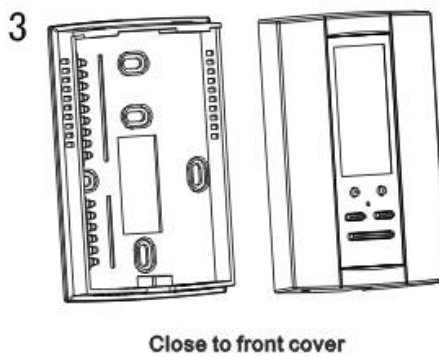
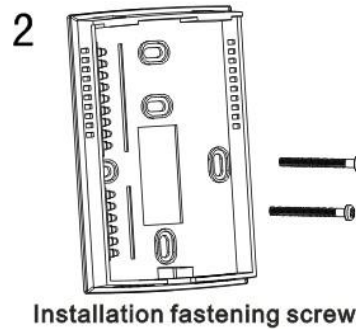
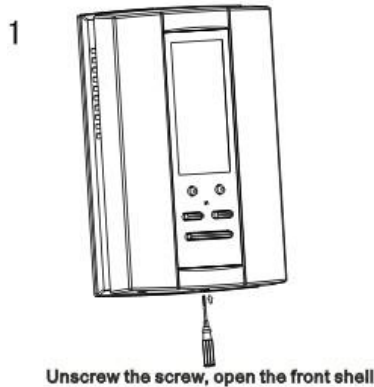


INSTALL THE THERMOSTAT

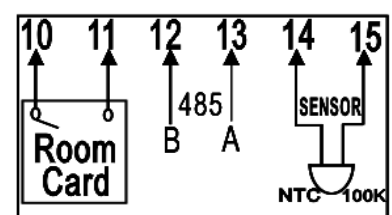
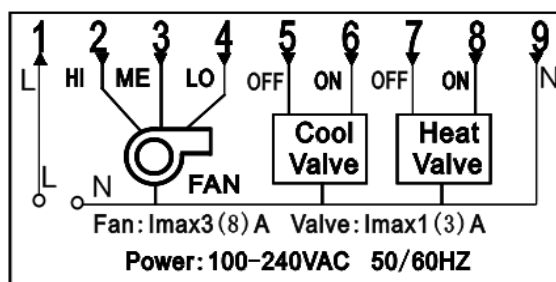
ATTACH THERMOSTAT BASE TO WALL

WARNING: ELECTRICAL SHOCK HAZARD

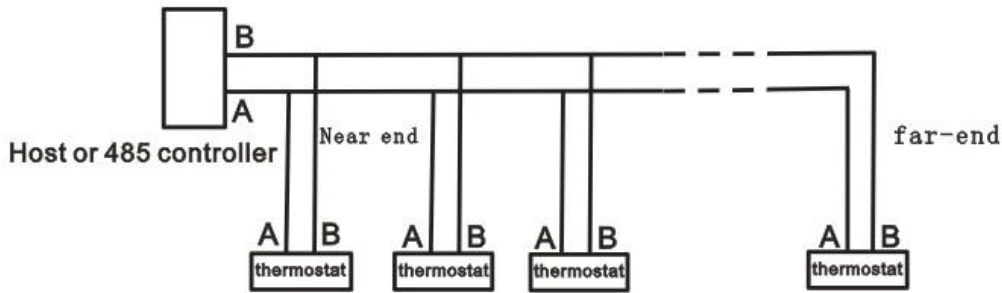
- Turn off power at the main service panel by removing the fuse or switching the appropriate circuit breaker to the OFF position before removing the existing thermostat.



WIRING DIAGRAM

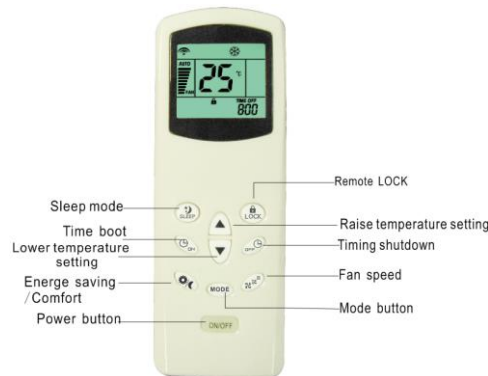


485 Communication Function Instruction



When 485 communication distance is more than 300m, need to increase terminal resistance in 485 the beginning of the communication terminal and end. Especially, if communication equipment quantity is less in trunk(less than 22pcs). When increase terminal resistance, only short circuit the terminal resistance jumper J5 of thermostat.

Remote Control - Optional



CONFIGURATION

The configuration menu allows you to set certain thermostat operating characteristics to your system or personal requirements. Switch off the thermostat, long press button ② over 4 seconds, till power on again means you have entered the first configuration menu item. There are 6 menu items. Press button ② to change to the next item and press button ④ or ⑤ to select.

In implicit parameter menu mode, long press button ⑥ for 3 seconds, all parameter will back to the initial value.

Step	Press buttons	Displayed (factory default)	Press ▲、▼ to select	Descriptions
1	② 4 seconds	CL (0)	-4—+4	Adjust temperature coefficient
2	②	HH (35°C)	20°C—50°C	Select maximum setting temperature for heating
3	②	HL (5°C)	5°C—20°C	Select minimum setting temperature for cooling
4	②	FC (°C)	°C/°F	Temperature unit option
5	②	bl (2)	1、2、3	Display backlight option
6	②	re (rd)	rd, rE	Memorize option before power loss
7	②	LR (On)	OFF/On	Fan stop option
8	②	CH (4)	4/2	Control system option
9	②	Ad (1)	1--255	Communication address
10	②	CR (18°C)	10—18°C	Heating mode without room card temperature
11	②	CC (25°C)	25—30°C	Cooling mode without room card temperature
12	②	LE (SC)	SC/OC/00	Activate Room Card function mode option

1) Adjust temperature coefficient 4 LO to 4 HI

You can adjust the room temperature display up to 3 higher or lower. Your thermostat was accurately calibrated at the factory but you have the option to change the display temperature to match your previous thermostat.

2) Select maximum temperature for heating

This feature provides a maximum set point temperature for heat. The default setting is 35°C, it can be changed between 20°C to 50°C

3) Select minimum temperature for cooling

This feature provides a minimum set point temperature for cooling. The default setting is 5°C, it can be changed between 5°C to 20°C

4) Select temperature unit

°C or °F, the factory default is °C

5) Display backlight mode option

1: The light will keep the light off continuously.

2: The display will be on when any button of the thermostat is touched, light off automatically after 10 seconds

3: The display will keep the light on continuously

The factory default is 2

6) Memorize switch on/off option before power loss

Using button ④ or ⑤ to select “rE” or “rd”. “rd”: The thermostat is switched on or off before power loss, after the power supply comes to normal again the thermostat will keep switch off; “rE”: The thermostat will Memorize its ON or OFF status before power loss. The factory default is “rd”

7) Fan stop option

Using button ④ or ⑤ to select “ON” or “OFF”. If you select “ON” the thermostat will turn on the fan at a speed provided by the Fan Switch and will not stop the fan when there is no call for heat or cool. If you select “OFF”, the thermostat will stop the fan when there is no call for heat or cool.

8) Select control system

Press button ④ or ⑤ to select 4 or 2. 4 means four pipe; 2 means two pipe. The factory default is 4.

9) 485 communication address

The setting range is 1—255, the factory default is 1, press button ④ or ⑤ to select.

10) Select energy saving set point for heating

This feature allows you to set energy saving set point temperature for heating. The default setting is 18°C, It can be changed between 10°C to 18°C

11) Select energy saving set point for cooling

This feature allows you to set energy saving set point temperature for cooling. The default setting is 25°C, It can be changed between 25°C to 30°C

12) Activate Window Card function mode option



This feature allows you to select the way to activate the energy saving mode.

Select OC to activate the energy mode by open circuit.

Select SC to activate the energy mode by close circuit.

Select 00 to cancel the energy mode.

Timer switch on/off function and relay delay protection function

In switch off state, long press button  for 3 seconds, will enter into set the automatically switch on time, press button ④ or ⑤ to set the time, the time value will raise or lower 0.5; In switch on state, long press button  for 3 seconds, will enter into set the automatically switch off time, similarly press the raise button or lower button to set the time value.

In timer switch on/off mode, the setting value is the countdown value. For example: when you set the time value is 3.5 in switch on state, your thermostat will switch off automatically after three and a half hours. If the time value is 0, means you have closed the timer switch on/off function. In switch on state, if you have open the timer switch off function, the LCD will display the timer mark and the remaining time.

The thermostat also have relay delay protection, remote control and 485 communication function.

Universal Thermostat Interface Protocol V1.1

1. Basic Introduction of Protocol

No.	Para_Name	Protocol_Provision
1	Work_mode	RS-485, master-slave mode, slave:thermostat
2	Physical_interface	A (+), B (-), GND three wire system or A(+),B(-) two wire system
3	Baud_rate	9600
4	Byte_format	10 bits(1 start bit+8 data bits+1 stop bit)
5	transmission	RTU (consult MODBUS standard protocol)
6	Thermostat_addr	1-247
7	Command_code	3,6(3- read thermostat, 6- configure thermostat)
8	CRC	CRC 16(consult MODBUS standard protocol)
9	CRC_check_mode	CRC 16(consult MODBUS standard protocol)
10	Date_frame	>4 bits

2, Data Frame Read of Thermostat

Command frame(from PC):Read all states of thermostat

bit 1	bit 2	bit 3	bit 4	bit 5	bit 6	bit 7t	bit 8
thermostat_addr	03 data-read command	00 start_addr high byte	00 start_addr low byte	00 reg_No. high byte	08 reg_No. low byte	CRC low byte	CRC high byte

Response frame(from thermostat)

bit 1	bit 2	bit 3	bit 4...19	bit 20	bit 21
thermostat_addr	03 data-read command	10 register(16)	thermostat state value (8 registers)	CRC_low	CRC_high

Air conditioner state value Description Table

byte	value	description	reg_addr
byte 4	00	thermo_state high byte: typically 00	0 reg (off-on)
byte 5	00/01	thermo_state low byte: 00—off, 01—on	
byte 6	00	thermo_mode high byte: typically 00	1 reg (mode)
byte 7	01-03	thermo_mode low byte: 1-cooling, 2-heating, 3-ventilation	
byte 8	00	thermo_fan_speed high byte, typically 0	2 reg (fan speed)
byte 9	00-03	thermo_fan_speed low byte	
		00 - auto	
		01 - high	
		02 - mid	
03 - low			
byte 10	XX	set_temp high byte	3 reg (set_temp)
byte 11	YY	set_temp low byte	
byte 12	00	key_lock_state high byte	4 reg (key_lock)
byte 13	00	key_lock_state low byte	

byte 14	00	current thermo_temp high byte	5 reg (room_temp)
byte 15	00	current thermo_temp low byte	
byte 16	00	reserved 1 high byte	6 reg (reserve)
byte 17	00	reserved 1 high byte	
byte 18	00	reserved 1 high byte	7 reg (reserve)
byte 19	00	reserved 1 high byte	

3, Single Data Frame Read of Thermostat

Command frame 1: read thermostat on/off state

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7	byte 8
thermo_addr	03	00	00	00	01	CRC_low	CRC_high
	data-read command	start_addr high byte	start_addr low byte	reg_No. high byte	reg_No. low byte		

Response frame(from thermostat)

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7
thermo_addr	03	02	00	xx	CRC_low	CRC_high
	command code	bytes	switch state high byte	switch state low byte		

Switch state value: 0000 - FCU off , 0001 - FCU on

Command frame2: read thermostat mode state

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7	byte 8
thermo_addr	03	00	01	00	01	CRC_low	CRC_high
	command code	start_addr high byte	start_addr low byte	reg_No. high byte	reg_No. low byte		

Response frame(from thermostat)

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7
thermo_addr	03	02	00	xx	CRC_low	CRC_high
	command code	bytes	mode state high byte	mode state low byte		

Mode state value:0001 - cooling , 0002 - heating, 0003 - ventilation

Command frame 3:read thermostat fan_speed state

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7	byte 8
thermo_addr	03	00	02	00	01	CRC_low	CRC_high
	command code	start_addr high byte	start_addr low byte	reg_No. high byte	reg_No. low byte		

Response frame(from thermostat)

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7
thermo_addr	03	02	00	xx	CRC_low	CRC_high
	command code	bytes	fan_speed state high byte	fan_speed state low byte		

Fan_speed state: auto - 0000, high - 0001, mid - 0002, low - 0003

Response frame: Command returns when all is done correctly;
No response when operation is wrong, PC will handle it ;
subsequent sets follow this answer/respond rule

Command frame 2(from PC) mode configuration

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7	byte 8
thermo_addr	06	00	01	00	xx	CRC_low	CRC_high
	command code	start_addr high byte	start_addr low byte	set value high byte	set value low byte		

Set value: 0001 - cooling, 0002 - heating, 0003 - ventilation;

Command frame 3(from PC) set fan_speed

byte 1	byte 2	byte 3	byte4	byte 5	byte 6	byte 7	byte 8
thermo_addr	06	00	02	00	xx	CRC_low	CRC_high
	command code	start_addr high byte	start_addr low byte	set value high byte	set value low byte		

Set value: 0000 - auto speed, 0001- high speed, 0002- mid speed, 0003-low speed

Command frame 4(from PC) set_temp

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7	byte 8
thermo_addr	06	00	03	xx	yy	CRC_low	CRC_high
	command code	start_addr high byte	start_addr low byte	set value high byte	set value low byte		

high byte:xx-01 low byte: yy-2c

0x012c= 300 (set_temp can only be set as a multiple of 5, range: 50~350) set_temp: 30.0°C

Command frame5(from PC) set key lock

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7	byte 8
thermo_addr	06	00	04	00	xx	CRC_low	CRC_high
	command code	start_addr high byte	start_addr low byte	key lock high byte	key lock high byte		

Set value:0000 – unlock, 0001 – lock

Command frame 4: read thermostat set_temp

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7	byte 8
thermo_addr	03	00	03	00	01	CRC_low	CRC_high
	command code	start_addr high byte	start_addr low byte	reg_No. high byte	reg_No. low byte		

Response frame(from thermostat)

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7
thermo_addr	03	02	XX	YY	CRC_low	CRC_high
	command code	bytes	set_temp high byte	set_temp high byte		

high byte: XX-01 low byte: YY-2c

0x012c= 300 (set_temp can only be set as a multiple of 5, range: 50~350) set_temp: 30.0°C

Command frame 5: read thermostat key lock state

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7	byte 8
thermo_addr	03	00	04	00	01	CRC_low	CRC_high
	command code	start_addr high byte	start_addr low byte	reg_No. high byte	reg_No. low byte		

Response frame(from thermostat)

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7
thermo_addr	03	02	00	xx	CRC_low	CRC_high
	command code	bytes	key lock high byte	key lock low byte		

key lock state: 0000 - unlock, 0001 - lock

Command frame 6: read thermostat current temperature

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7	byte 8
thermo_addr	03	00	05	00	01	CRC_low	CRC_high
	command code	start_addr high byte	start_addr low byte	reg_No. high byte	reg_No. low byte		

Response frame(from thermostat)

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7
thermo_addr	03	02	xx	yy	CRC_low	CRC_high
	command code	bytes	current_t mp high byte	current_t emp low byte		

high byte: xx-01 low byte:yy-2c 0x012c= 300 room_temp: 30.0°C

4, Set frame format of thermostat

Command frame 1(from PC) set off/on

byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7	byte 8
thermo_addr	06	00	00	00	xx	CRC_low	CRC_high
	command code	start_addr high byte	start_addr low byte	set value high byte	set value low byte		

set value:0000 - thermostat off , 0001 - thermostat on;