Hexa Controls RT226-J29 Modulating Digital Thermostat

Installation and operation instructions

3 Speed, Cooling only , Proportional-Integral control

Hexa Controls RT226-J29 modulating digital thermostats are designed to provide Proportional-Integral (PI) modulating control in 2-pipe fan coil units. This thermostat can provide modulating analog 0-10V or 0-20mA control signal.

Technical Data

Power…….220V AC 50Hz/60Hz
Temperature setting range……..5℃ -50℃
Temperature display range……..0℃ -60℃
Setting accuracy……0.5℃
Display accuracy.....0.1℃
Ambient temperature-operation…….0℃ ~+50℃
Ambient temperature-transport……..-10℃ ~+60℃

Features

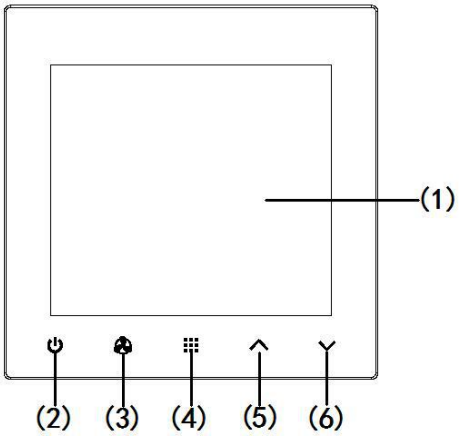
- Large LCD display with backlight
- Touch button easy for operation
- 3-speed fan control
- Maintains the temperature to within 0.5 degree set point
- Permanent user setting retention during power loss, no batteries are required
- RS485 communication
- External sensor or internal sensor option
- 7 day programmable
- Filer dirty alarm
- Key lock

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.
- Use this thermostat only as described in this manual.

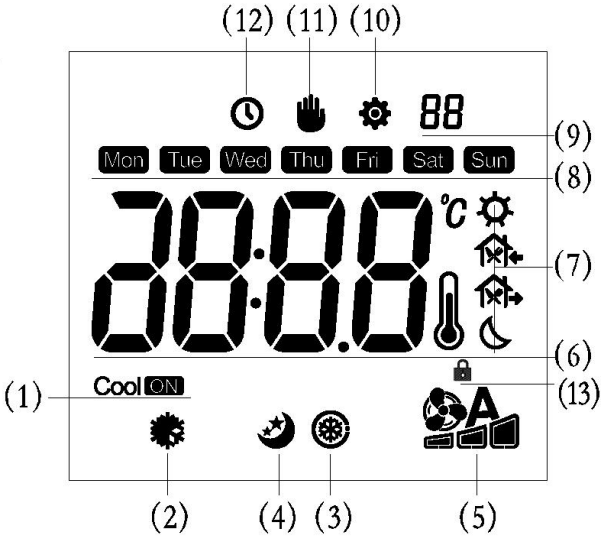
Button and Display

Thermostat Buttons and Switches



① Display area
② Power button(Short press to switch off thermostat;Long press into permanent hold mode in power on mode;Exit button)
③ Fan speed option button (HI MED LOW AUTO)
④ Menu button/time button/programmable button(Short press to set time;Long press to set programmable)
⑤ Raise button
⑥ Lower button

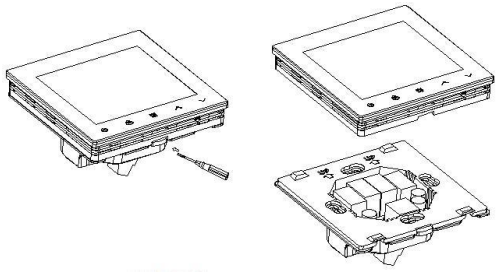
The Display



① Indicates thermostat is “calling” for cooling
② Indicates cooling mode
③ Indicate filter dirty alarm
④ Indicates room card activate
⑤ Indicates fan status
⑥ Indicates room temperature/ setting temperature/time
⑦ Indicates programmable
⑧ Indicates week
⑨ Indicates No. in configuration
⑩ Indicates setting mode
⑪ Indicates permanent mode
⑫ Indicates time setting
⑬ Indicates key lock

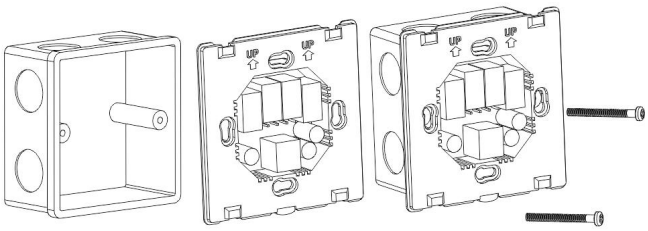
(11) and (12) show in same time mean it’s in temporary hold mode
(10) and (12) show in same time mean it’s in programming setting

INSTALL THE THERMOSTAT

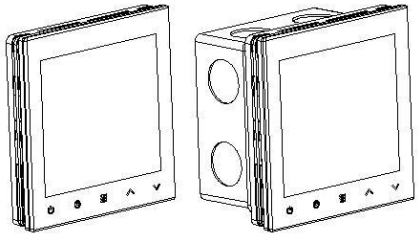


1. Gently opening the front panel by screw driver at the bottom open mouth.

Gently pulling the control panel straight off the base connector.

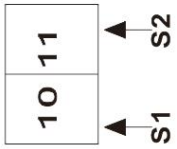


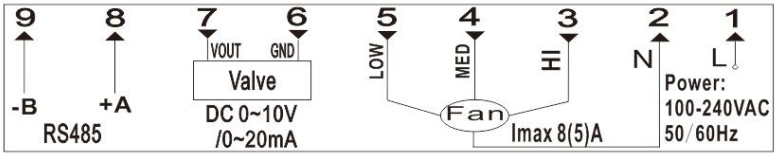
2. To screw for mounting thermostat in the wall.



3. Fix the cover on the base.

WIRING DIAGRAM



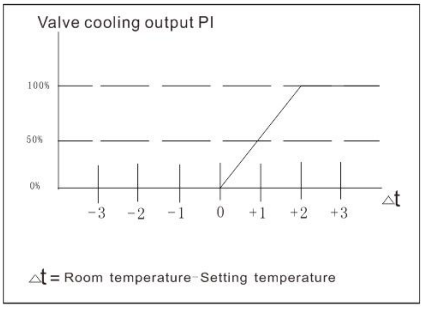


Thermostat Function Description

Cooling mode （Proportional-Integral(PI) control cooling）

Example: P-band is 2℃

The valve cooling output PI and the temperature differential(room temperature and setting temperature) as following picture.



Fan speed instruction

Continuously press button, you can select HI speed, MED speed, LOW speed and AUTO speed, the LCD will display corresponding marks. If you select the AUTO speed:

Room temperature is higher or equal 3℃ than the setting temperature, the fan will run HI speed; if the room temperature is higher or equal 2℃ and lower or equal 3℃ than the setting temperature, the fan will run MED speed. Other will run LOW speed.

If you choose fan run with valve in parameter 6 of configuration,the Auto fan would stop if cooling valve close

External sensor

When external sensor connected,thermostat will show temperature detected by external sensor.
When external sensor removed or open circuit,thermostat will show temperature detected by ambient sensor.

Key lock

In power on status,long press button to activate key lock or cancel the button lock.With different key lock option,refer parameter LF.

Room card

If room card is not present,it could set default setting temperature from configuration menu by parameter 9.
If room card activate,it could set energy saving temperature from configuration menu by parameter 10.

Configuration Menu operation

The configuration menu allows you to set certain thermostat operating characteristics to your system or personal requirements. Switch off the thermostat, long press button ▲ or ▼ more than 3 seconds to enter the configuration menu, The display will show the first item in the configuration menu. Press button to shift to the next menu item, use ▲ or ▼ to select. To exit the menu , pressing power button to switch off the thermostat. Thermostat will exit the configuration menu if no buttons are pressed within 20 seconds. The configuration menu chart summarizes the configuration options. In implicit parameter menu mode, long press button for 3 seconds, all parameter will back to the initial value.An explanation of each option as follows:

Item	Displayed （factory default）	Press▲、▼to select	Description
1	CL (0)	-4 --- +4	Select temperature display adjustment higher or lower
2	AH (35℃)	AL—50℃	Select maximum temperature limitation
3	AL (5℃)	5℃—AH	Select minimum temperature limitation
4	bL（2）	1/2/3	Select display backlight mode 1: without backlight 2:without any button, backlight will light off after 10 seconds 3: backlight will keep on always
5	rE(rE)	rE/rd	Memorize option before power loss rE: With memorize option before power loss rd: without memorize option before power loss
6	LA (OFF)	ON/OFF	Fan stop option ON: Fan will not stop if there is no call for heat or cool . OFF: Fan will stop with the valve if there is no call for heat or cool.
7	AD(1)	1-255	RS485 Modbus communication
8	dC (0)	Select function of terminal S1/S2	0：S1/S2 would be room card function 1：S1/S2 would be external sensor function

			2: S1/S2 would be filter detected function
9	SH(24℃)	18℃-30℃	Select temperature setting when room card not present
10	CC (25℃)	18℃-50℃	Select energy-saving temperature for cooling in room card mode
11	LE (SC)	SC/OC/OO	Activate energy saving mode option SC: with room card/filter detected, activate the energy mode by open circuit OC: with room card/filter detected, activate the energy mode by close circuit OO: without room card function/filter detected function
12	dB(2℃)	1℃- 10℃	Select Proportional band
13	PS(0)	0/2/3/7	0：Non-programmable 2: 5+2 programmable 3: 5+1+1 programmable 7:7 days individual programmable
14	LF(1)	0/1/2	0:All buttons are locked when the button lock is activated 1:Only the up and down button can operate when the button lock is activated 2:Only the up /down/fan button can operate when the button lock is activated
15	Bd(3)	0,1,2,3	Baud rate 0:2400,1:4800,2:9600,3:19200
16	Cd(0)	0.1.2	verification mode 0：None parity 1：Odd parity 2：Even parity

Programmable Setting

Long press ⠿ over 3 second in power on ,it run into programmable setting menu (Keep you chose 5+2 programmable ,5+1+1 programmable or 7 days programmable) .Press▲▼ to set time/adjust temperature.Press ⠿ to go to next step.Press ⏻ to save what you setting and exit.

Excel 1（7 days programmable factory setting）

COOL	**1st**	**6:00**	**24℃**
	2nd	**8:00**	**22℃**
	3rd	**18:00**	**24℃**
	4th	**22:00**	**22℃**

RS-485 MODBUS universal interface protocols

Ⅰ、Basic description

Number	Parameter	Protocol provision
1	Operating mode	RS-485,master-slave；thermostat is the slave machine
2	Physical interface	A(+),B(-),GND three-wire system，or A(+),B(-) two-wire system
3	Baud rate	9600(It can set in configuration menu)
4	Byte format	10 format（1 start bit+8 data bits +1 stop bit）
5	Transmission mode	RTU format（consult MODBUS standard）
6	Thermostat address	1—255
7	Command code	3，6(3—read thermostat， 6—set thermostat)
8	CRC check code	CRC-16(consult MODBUS standard)
9	CRC verification mode	CRC-16(consult MODBUS standard)
10	Data frame interval	Greater than 4 bytes

Ⅱ、Read the thermostat frame format

Command frame（give by upper computer）： Read the conditioner state

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat address	03(readout command code)	00(Start address) High byte	00(Start address) Low byte	00(register count) High byte	0A(register count) Low byte	CRC low	CRC high

Response frame（give by thermostat）

Byte 1	Byte 2	Byte 3	Byte 4…….Byte 19	Byte 20	Byte 21
Thermostat address	03(readout command code)	14 Bytes	Air conditioning state value	CRC low	CRC high

Air conditioning state instructions

Byte	Value	instruction	Register address
Byte 4	00	Thermostat status is high byte: general is 00	0(ON/OFF)
Byte 5	00/01	Thermostat status is low byte: 00 –mean close，01—mean open	
Byte 6	00	Thermostat mode is high byte: general is 00	1(MODE)
Byte 7	01-03	Thermostat mode is low byte,1-cool	
Byte 8	00	Thermostat fan speed is high byte,general is 0	2(Fan speed)
Byte 9	00-03	Thermostat fan speed is low byte	
		00--Auto speed	
		01 – High speed	
		02 – Med speed	

		03 – Low speed	
Byte 10	XX	Setting temperature high byte	3(setting temperature)
Byte 11	YY	Setting temperature low byte	
Byte 12	00	Proportional Valve position high byte	4(Proportional valve position)
Byte 13	00	Proportional Valve position low byte	
Byte 14	00	Thermostat temperature current status high byte	5 (Room temperature)
Byte 15	00	Thermostat temperature current status low byte	
Byte 16	00	External sensor's temperature high byte	6（External sensor's temperature）
Byte 17	00	External sensor's temperature low byte 0XFFFF-Alarm	
Byte 18	00	Room card status high byte	7（Room card status）
Byte 19	00	Room card status low byte	
Byte 20	00	Filter dirty status high byte	8(Filter dirty status)
Byte 21	00	Filter dirty status low byte	
Byte 22	00	Fan running status high byte	9(Fan running status)
Byte 23	00	Fan running status low byte 0:Fan close ,1:High , 2:Med ,3:Low	
Byte 24	00	Read thermostat status is high byte: general is 00	10(ON/OFF)
Byte 25	00/01	Read thermostat status is low byte: 00 –mean close，01—mean open	
Byte 26	00	Read thermostat fan speed is high byte,general is 0	11(Fan speed)
Byte 27	00-03	Read thermostat fan speed is low byte 0:AUTO 1:HIGH 2:MED 3:LOW	
Byte 28	XX	Setting temperature high byte	12(setting temperature)
Byte 29	YY	Setting temperature low byte	

Ⅲ、Read the thermostat frame format

Command frame 1：Read the thermostat ON/OFF state

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat address	03(readout command code)	00（start address）High byte	00（start address）Low byte	00(register count) High byte	01(register count) Low byte	CRC low	CRC high

Response frame（give by thermostat）

Thermostat address	03 (command code)	02 (Bytes)	00(ON/OFF state high byte)	XX(ON/OFF state low byte)	CRC low	CRC high

ON/OFF state value：0000 – Fan coil OFF， 0001 – Fan coil ON

Command frame 2：Read the thermostat mode state

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8

Thermostat address	03(readout command code)	00(start address) High byte	01(start address) Low byte	00(register count) High byte	01(register count) Low byte	CRC low	CRC high

Response frame（give by thermostat）

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Thermostat address	03 (command code)	02 (Bytes)	00(Mode status High byte)	XX(Mode status Low byte)	CRC low	CRC high

Mode state value：0001– cooling

Command frame 3：Read the thermostat fan speed state

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat address	03(readout command code)	00(start address) High byte	02(start address) Low byte	00(register count) High byte	01(register count) Low byte	CRC low	CRC high

Response frame（give by thermostat）

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Thermostat address	03 (command code)	02 (Bytes)	00 Fan speed High byte	XX Fan speed Low byte	CRC low	CRC high

Fan coil state value：0000-Auto,0001 – High，0002– Medium，0003– Low

Command frame 4：Read thermostat setting temperature

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat address	03(command code)	00(start address) High byte	03(start address) Low byte	00(register count) High byte	01(register count) Low byte	CRC low	CRC high

Response frame（give by thermostat）

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Thermostat address	03 (command code)	02 (Bytes)	XX (Setting temperature) High byte	YY (Setting temperature) Low byte	CRC low	CRC high

Temperature value is 0x012c,high byte 01, low byte 2c,

0x012c= 300 （setting temperature only can be the multiple of 5，the range is 50~350）setting temperature is 30.0℃

Command frame 5：Read the thermostat proportional valve position

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8

Thermostat address	03(command code)	00(start address) High byte	04(start address) Low byte	00(register count) High byte	01(register count) Low byte	CRC low	CRC high

Response frame（give by thermostat）

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Thermostat address	03 (command code)	02 (Bytes)	05(Proportional valve position) High byte	XX(Proportional valve position) Low byte	CRC low	CRC high

0-100%

Command frame 6： Read the thermostat current temperature value

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat address	03(command code)	00(start address) High byte	05(start address) Low byte	00(register count) High byte	01(register count) Low byte	CRC low	CRC high

Response frame（give by thermostat）

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Thermostat address	03 (command code)	02 (Bytes)	XX(current temperature value) High byte	YY(current temperature t value) Low byte	CRC low	CRC high

Temperature value is 0x012c ,high byte 01,low byte 2c

0x012c=300 room temperature is 30℃

Command frame 7： Read the thermostat external sensor’s temperature

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat address	03(command code)	00(start address) High byte	06(start address) Low byte	00(register count) High byte	01(register count) Low byte	CRC low	CRC high

Response frame（give by thermostat）

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Thermostat address	03 (command code)	02 (Bytes)	XX(external sensor’s temperature) High byte	YY(external sensor’s temperature) Low byte	CRC low	CRC high

Temperature value 0Xxxyy is 0x012c ,high byte 01,low byte 2c

0x012c=300 room temperature is 30℃. OXFFFF is alarm

Command frame 8： Read the thermostat room card status(DC is 0)

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat	03(command	00(start	07(start	00(register	01(register	CRC	CRC

address	code)	address) High byte	address) Low byte	count) High byte	count) Low byte	low	high

Response frame（give by thermostat）

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Thermostat address	03 (command code)	02 (Bytes)	00(room card status) High byte	X(room card status) Low byte	CRC low	CRC high

0000-insert room card status ,0001--without room card status

Command frame 9：Read filter dirty status(DC is 2)

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat address	03(command code)	00(start address) High byte	08(start address) Low byte	00(register count) High byte	01(register count) Low byte	CRC low	CRC high

Response frame（give by thermostat）

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Thermostat address	03 (command code)	02 (Bytes)	XX(filter dirty status) High byte	YY(filter dirty status) Low byte	CRC low	CRC high

0000-Filter is normal　0001-Filter alarm

Command frame 10：Read the fan running status

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat address	03(command code)	00(start address) High byte	09(start address) Low byte	00(register count) High byte	01(register count) Low byte	CRC low	CRC high

Response frame（give by thermostat）

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Thermostat address	03 (command code)	02 (Bytes)	XX(fan status) High byte	YY(fan status) Low byte	CRC low	CRC high

0000-Fan close　0001-High　0002-Med　0003-Low

Command frame 11：Read the thermostat ON/OFF state

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat address	03(readout command code)	00（start address）High byte	0A（start address）Low byte	00(register count) High byte	01(register count) Low byte	CRC low	CRC high

Response frame（give by thermostat）

Thermostat address	03 (command	02 (Bytes)	00(ON/OFF state high	XX(ON/OFF state low	CRC low	CRC high

	code)		byte)	byte)		

ON/OFF state value：0000 – Fan coil OFF， 0001 – Fan coil ON

Command frame 12：Read the thermostat fan speed state

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat address	03(readout command code)	00(start address) High byte	0B(start address) Low byte	00(register count) High byte	01(register count) Low byte	CRC low	CRC high

Response frame（give by thermostat）

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Thermostat address	03 (command code)	02 (Bytes)	00 Fan speed High byte	XX Fan speed Low byte	CRC low	CRC high

Fan coil state value：0000-Auto,0001 – High，0002– Medium，0003– Low

Command frame 13：Read thermostat setting temperature

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat address	03(command code)	00(start address) High byte	0C(start address) Low byte	00(register count) High byte	01(register count) Low byte	CRC low	CRC high

Response frame（give by thermostat）

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
Thermostat address	03 (command code)	02 (Bytes)	XX (Setting temperature) High byte	YY (Setting temperature) Low byte	CRC low	CRC high

Temperature value is 0x012c,high byte 01, low byte 2c,

0x012c= 300 （setting temperature only can be the multiple of 5，the range is 50~350）setting temperature is 30.0℃

Ⅳ、Set the thermostat frame format

Command frame 1（give by upper computer）set the thermostat ON/OFF

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat address	06(command code)	00(start address) High byte	00(start address Low byte)	00(Setting value high byte)	XX(Setting value low byte)	CRC low	CRC high

Setting value: 0000 – thermostat OFF, 0001 – thermostat ON;

Response frame: correctly operate, the instruction will return to the same;

Operation is not correct does not response, the upper computer will manage;

The rule about subsequent response of setup command is same with this.

Command frame 2（give by upper computer）set the mode

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8

Thermostat address	06(command code)	00(start address) High byte	01(start address Low byte)	00(Setting value high byte)	XX(Setting value low byte)	CRC low	CRC high

Setting value: 0001 – cool

Command frame 3（give by upper computer）set the fan speed

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat address	06(command code)	00(start address) High byte	02(start address Low byte)	00(Setting value high byte)	XX(Setting value low byte)	CRC low	CRC high

Setting value: 0000-Auto speed,0001- High speed, 0002- Mid speed, 0003- Low speed

Command frame 4（give by upper computer）set the setting temperature

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat address	06(command code)	00(start address) High byte	03(start address Low byte)	XX(Setting temperature high byte)	YY(Setting temperature low byte)	CRC low	CRC high

High byte XX: 01 Low byte YY:2c

0x012c= 300 （setting temperature only can be the multiple of 5，the range is 50~350）setting temperature is 30.0℃

CUSTOMER ASSISTANCE

After reading this guide, if you have any question about the operation of your thermostat, please contact your installer or service provider.