Heating Room Thermostat
User Guide
Model: BHT-002modbus

Welcome

Thank you for your purchase.

Your new thermostat will provide uniform and comfortable temperature control throughout every room in your property. We bring together technology, craftsmanship and the highest quality materials to provide you with a safe, reliable product combined with sleek, contemporary design. Please read this installation/programming manual for comprehensive instructions on installing and operating your thermostat. Please ensure a suitably qualified person installs your thermostat and complies with all local regulations.

(002FB: full black   002BW: black and white
002WB: white and black   002FW: full white)

Contents

Thermostat	1pc
Screws	1pc
Installation/programming manual	1pc
Wall plate	1pc
2.5m External (Floor) Sensor(optional)	1pc

Warranty

Your thermostat carries an 24 months warranty from date of purchase. Service outwith the warranty period may incur a charge.

Your thermostat

The BHT- 002 range has been developed to control electric underfloor or water heating or water/gas boiler system. These units are designed for use in commercial, industrial, civil and domestic properties.

Features

Simple installation
Acrylic face plate
Large, backlit display
Sleek, contemporary design
Elegant chrome frame
Feather touch control panel
5+2 six period per day programming
Simple, one-touch temperature control over-ride
Pre-set temperatures maintained within +/- 1°C
Internal and external sensors allow control of both air and/or floor temperatures
Suitable for installation in a standard single pattress box or European 60mm round box
RS485/MODBUS communication optional

Home screen quick reference
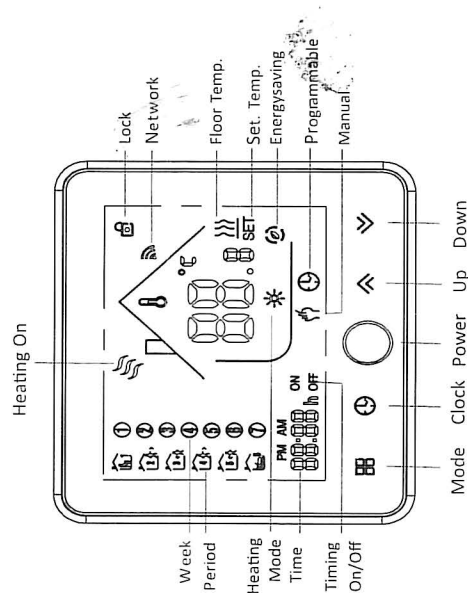
Technical Data

Sensor: NTC
Accuracy: ±1°C
Set Temp. Range: 5-35°C
Room Temp. Range: 5-99°C
Power Consumption: < 1.5W
Timing Error: <1%
Power Supply: 95 ~ 240VAC, 50 ~60Hz
Current Load: 5A （water heating, water/gas boiler).
　　　　　　　16A （electric heating)
Shell material: PC+ABS (flame retardant)
Dimension: 86x86x13.3mm
Ambient Temp.: 0-45°C、5-95%RH
　　　　　　　（Non-condensing）
Storage Temp.: -5-55°C
Installation Hole distance: 60mm

Operation/programming

1. Power on/off

Press ○ to turn on/off.

2. Adjusting/setting the temperature

Press ≪ ≫ to set the desired temperature.

3. Adjusting/Setting the clock

Touch the icon ⏰ to set minute, hour and weekday (1 = Monday, 2 = Tuesday etc.) by using the ≪ ≫ arrows. Press ⏰ once more to confirm and exit.

4.Locking your thermostat

Press and hold the ⏰ and ≪ arrows for 5 seconds to lock/unlock your thermostat.

5.Adjusting/setting the program schedules

Your thermostat provides six scheduled heating periods each day – three Comfort periods - 1, 3 & 5 (the temperature required when room is occupied) and three Economy periods – 2, 4 & 6 (the temperature required when room is unoccupied). You can set both the time and temperature for each of these six daily periods. Adjusting/setting the schedules can only be carried out when in program mode;

Touch ⊞ (mode) to change between manual mode and programme mode. In manual mode,

Your thermostat is suitable for installation within a standard 86mm pattress box or European 60mm round pattress box.

Step 1. Keep power off. See Fig 1.

Fig 1

Step 2. Remove the mounting Plate. See Fig 2.

Fig 2

Step 3. Connect power supply, load and external (floor) sensor into the appropriate terminals if there is external sensor. (see "Wiring your thermostat" for details and Fig 3).
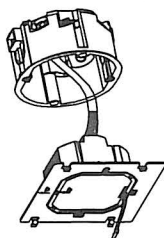
Fig 3

Step 4. Fix the mounting plate into the wall with screws in the box. See Fig 4

Fig 4

Step 5. Fasten body of thermostat and the mounting plate through the groove. See Fig 5.

Fig 5

Fig 6

Step 6. Installation complete. See Fig 6.

RISK OF ELECTRICAL SHOCK. Disconnect/isolate power supply prior to making electrical connections. Contact with high voltage components can cause electrical shock, severe injury or death.

6. System function settings

With power off, press and hold both ⊞⊞ and 🕒 for 5 seconds to enter the System Functions. Press ⊞⊞ to scroll through the available functions, and use the ≪ and ≫ arrows to change the available options. Your thermostat will automatically exit the System Functions settings after approximately 15 - 20 seconds of inactivity. All settings are automatically

Code	Function	Setting and options	Default
1	Temperature compensation	-9 to +9℃ (for internal sensor)	-1
2	Deadzone temperature	1-5℃	1
3	Button locking	00: All buttons are locked except power button. 01: All buttons are locked.	1
4	Sensor types	IN: Internal Sensor（to control or limit the temperature） AL: Internal/ External Sensor(Internal sensor to control temperature, external sensor to limit temperature) OU:Only external sensor	1
5	Min. Set Temp.	05-15℃	05
6	Max. Set Temp.	15-45℃	35
7	Time Display	00:12 hours 01:24 hours	1
8	Display Mode	00: display both set temp. and room temp. 01: display set temp. only	0
9	High temperature protection setting.	25-70℃.	45
A	Low temperature protection setting	0-10℃	00
B	IP Setting	01-OxFF	01

Please note:

1. "Err" on your thermostat indicates a fault without the external (floor) sensor. Your thermostat will be inoperative until the error is rectified.
2. When sensor selection is "AL" (option 3 above) the room temperature will be displayed on your thermostat by default. The floor temperature can be displayed temporarily by pressing the ≫ button for three seconds. Your thermostat will revert to display the room temperature after several seconds.

🕛 will show in the screen.

Touch the icon 🕒 for four times until the weekday schedule settings appear (1 2 3 4 5 will show along the top of the screen).

Use the ≪ and ≫ arrows to adjust the time for the 1st (Comfort) period

Press the icon 🕒 and use the ≪ and ≫ arrows to set the temperature for the 1st period.

Repeat this process for periods 2 – 6.

Press the icon 🕒 once more to enter the weekend schedule settings (6 & 7 will show along the top of the screen).
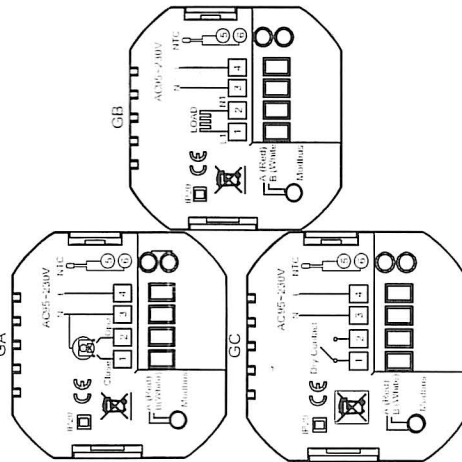
Repeat the above process to set the weekend schedule. Press 🕒 once more to confirm and exit.

Default settings for program schedule

Time display	WEEKDAY (MON. – FRI.)		WEEKEND (SAT. – SUN.)	
	TIME	TEMP.	TIME	TEMP.
Period 1 (Comfort)	06.00 waken	20°C	06.00 waken	20°C
Period 2 (Economy)	08.00 leave	15°C	08.00 leave	20°C
Period 3 (Comfort)	11.30 home	15°C	11.30 home	20°C
Period 4 (Economy)	13.30 leave	15°C	13.30 home	20°C
Period 5 (Comfort)	17.00 home	22°C	17.00 home	15°C
Period 6 (Economy)	22.00 bed	15°C	22.00 bed	15°C

Default settings above assume a 5+2 (day) weekly program.

Wiring your thermostat

Please note:
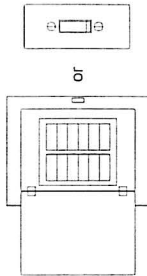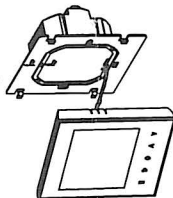Do not over-tighten the terminals in your thermostat as damage may occur.
GA for under floor heating, GB for electric heating.
GC for water/gas boiler. External Sensor is optional.

Thermostat Universal Interface Protocols V1.0

This protocol takes standard MODBUS as a reference, mainly use for communication between thermostat and upper computer. This protocol doesn't describe the MODBUS. As to standard MODBUS, please refer to the relevant standard documents.

1. **Basic description**

No	Parameter	Protocol provision
1	Operating mode	RS-485,master-slave; thermostat is the slave machine
2	Physical interface	A(+),B(-) two-wire system
3	Baud rate	9600 bps for standard
4	Byte format	9 format (8 data bits +1 stop bit+None parity)
5	Modbus	RTU
6	Transmission mode	RTU format (Please refer to standard MODBUS)
7	Thermostat address	1—255;
8	Command code	03，06(03—read thermostat， 06—set thermostat)
9	CRC check code	CRC—16 (Please refer to standard MODBUS)
10	CRC verification mode	CRC—16 (Please refer to standard MODBUS)

2. Read the thermostat frame format

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat address (default is 0X01)	03	Set register start address high byte	Set register start address low byte	Set register value high address	Set register value low address	CRC high	CRC low

Command	Byte	Description	Register address
03	High Byte	00	40001
	Low Byte	Setting Power On/off: 0—means closed, 1—means open	
	High Byte	00	40002
	Low Byte	Temperature for internal sensor*10	
	High Byte	00	40003
	Low Byte	Setting Mode: 00 means weekly Program; 010 means Manual	
	High Byte	00	40004
	Low Byte	Heating status: 0: Not Heating 1: Heating	
	High Byte	00	40005
	Low Byte	Manual Mode Setting Temperature:Manual Setting Temperature*10	
	High Byte	00	40006
	Low Byte	Weekly Mode Setting Temperature:Weekly Setting Temperature*10	
	High Byte	00	40007
	Low Byte	Setting lock:0-unlock 1-lock	

3. Set the thermostat frame format

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Thermostat address (default is 0X01)	06	Set register start address high byte	Set register start address low byte	Set value high address	Set value low address	CRC high	CRC low

Remark:

Command	Byte	Description	Register address
06	High Byte	00	40001
	Low Byte	Setting Power On/off: 0–means close, 1–means open	
	High Byte	00	40002
	Low Byte	Temperature for internal sensor: Reading Room Temperature*10	
	High Byte	00	40003
	Low Byte	Setting Mode: 00 means Weekly Program; 01 means Manual	
	High Byte	00	40004
	Low Byte	Heating status: 0 Not Heating; 1 heating	
	High Byte	00	40005
	Low Byte	Manual Setting Temperature*10	
	High Byte	00	40006
	Low Byte	Weekly Mode Setting Temperature:Weekly Mode Setting Temperature*10	
	High Byte	00	40007
	Low Byte	Setting lock:0-unlock 1-lock	

1. When thermostat sends collected temperature data to upper computer,   the value of collected temperature should be multiplied by 10 and sent completely by the format of HEX because the accuracy is 0.5℃.

For example: When the collected temperature is 25.5℃,   the value sent by thermostat to the upper computer will be 255.

Similarly, When upper computer sends set temperature data to thermostat,   the value of set temperature should be multiplied by 10 and sent completely by the format of HEX because the accuracy is 0.5℃.

For example: When the set temperature is 25.5℃,   the value sent by upper computer to the thermostat should be 255..

<center>E.G.: Read Temper= 25.5° C</center>

<center>The send(or receive) value is 25.5*10=255</center>

2. How to change thermostat IP address?

During power off, press button M and button Clock for 5 seconds at the same time into high senior options.

Press M to item B.

Then press up and down to change the relative value. The default is 0x01.