

Dual Control System Thermostat MH5H-TD



MH5H-TD dual control system thermostat is a Z-Wave (800 series) enabled device for indoor temperature control. It is mainly applied to a heat pump air-conditioning system with fan coil and valve control. It can read room temperature and local time, and automatically control fan speed based on the temperature difference. The device is of high reliability and practicability. This product can be included and operated in any Z-Wave network with other Z-Wave certified devices from any other manufacturers.

Features

- Capacitive touch buttons
- Tempered glass panel, PC alloy enclosure
- Precise temperature calibration function
- Non-volatile Memory, working state saved even power failure
- Intelligent control of 0-10V 3-speed fan, electric (ball) valve or air-valve
- Easily steel frame back plate installation

Specification

- Power Supply: AC90-250V, 50/60Hz
- Resistive Load: ≤3A
- Self Consumption: ≤1W
- Temperature Sensor: NTC 10K
- Working Environment: 0 ~ 55°C ; <95% RH (Non-condensation)
- Temperature Setting: 5-37 °C (Adjustable)
- Dimension: 86* 86*14mm
- Hole Pitch: 60-65mm (60 or 86 Standard junction box)
- Z-Wave Frequency: All frequency available
- Over Current Protection: Required external 10A circuit breaker



Declaration of Conformity

CE Hereby, we declare that the device is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.



• WEEE Directive Compliance

The device marked with this symbol should not be disposed of with household waste. It is the user's responsibility to deliver the used appliance to a designated recycling point.

• Z-Wave Compliance

The thermostat is a fully compatible Z-Wave Plus device.

Important Safety Instruction

- ⚠ Read the instructions before starting up the unit!
- ⚠ This product is not a toy. Keep out of reach of children and animals!
- ⚠ Do not expose the device to moisture, water or other liquids. Do not place liquids near or on the device!
- ⚠ Do not attempt to disassemble, repair or modify the device yourself!
- ⚠ This product is for indoor use only. Do not use outdoors!

⚠CAUTIONS!

Flush-mount only into a UL/ETL/CE certified plastic junction box. The minimum size should be 65*65*45mm, minimum Volume is 190cm³. Use Copper Conductors Only.

⚠CAUTIONS!

Risk of Electric Shock - More than one disconnect switch may be required to de-energize the equipment before servicing.

Installation

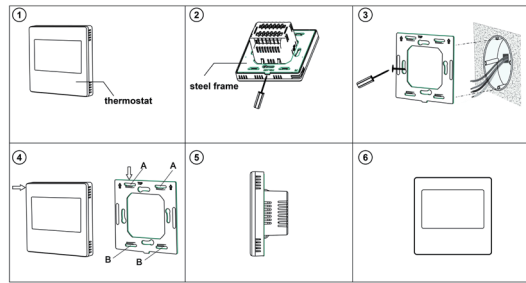
• Location:

The device is suggested to be installed indoor, a place with around 1.5m height above the floor where represents the average room temperature. It should be away from direct sunlight, any cover, or any heat source, to avoid false signal for temperature control.

Important!

- A qualified electrician with the understanding of wiring diagrams and knowledge of electrical safety should complete installation following the instructions.
- Before installation, please confirm the real voltage complying with the device's specification. Cut off any power supply to secure the safety of people and device.
- During installation, protect the device from any physical damage by dropping or bumping. If happens, please contact the supplier for maintenance.
- Keep the device away from acid-base and other corrosive solids, liquids, gases, to avoid damage.
- Avoid overexertion during operation, to protect device from mechanical damage.
- Read all instructions and documentation and save for future reference.

CAUTION: Cut off power supply at circuit breaker or fuse before installation to avoid fire, shock or death!



Step 1: Remove the steel frame from the device, and secure it onto the junction box with two screws.

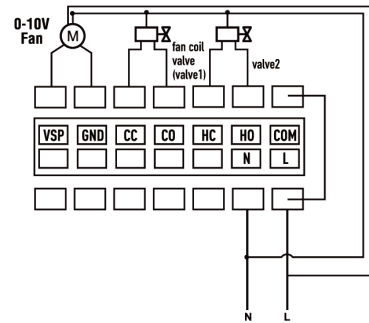
Step 2: Insert all wires into the right terminals and tighten screws. The wiring diagram is shown below.

Step 3: Attach the wired device on the points of the steel frame as shown in fig.4, and then push the whole device into junction box.

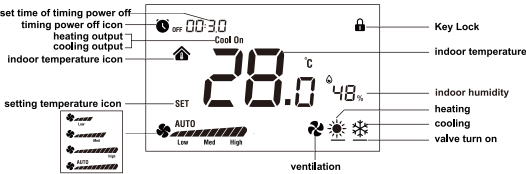
Step 4: Confirm the device is well mounted, power on and it is ready to operate.

Note: The using cable requirements of the thermostat need be complied with (UL) wire diameter:14~26AWG; (IEC) wire diameter :0.75~1.5mm². Strip length: 6~7mm.

Wiring Diagram



Button & Display



Operation

• On/Off Setting

When power on, device will display “OFF” , press ⏻ to enter working interface.

Under normal working interface, press ⏻ to turn off the device, “OFF”

displays and all outputs are off.

• Timed Shutdown

Under normal working interface, long press ⏻ + M for 3 seconds to enter timing setting interface, press ▼ or ▲ to adjust the setting value, press M to save the setting and return to normal working interface, ⏸ timing icon will display on the screen and setting range is 00~12 (in sequence), setting step is 0.5 hour, minimum unit is hour.

• Cancel Timed Shutdown

Turn on/off the device by manual, timed shutdown will be invalid automatically and the setting value changes to 0, or set the value of timing to 00:00 to cancel timed shutdown.

• Panel Lock

Under normal working interface or shutdown interface, long press ▼ + ▲ for 3 seconds to enter lock/unlock setting. If 🔒 appears on the screen, it indicates the panel are locked and all buttons are invalid. If 🔒 disappears on the screen, it indicates the buttons are unlocked and all buttons are available to operate.

• Fan Speed Setting

Under normal working interface, press ⚙ to switch among the fan speed: “Low, Medium, High, Auto” .

Note: In Ventilation mode, no Auto speed choice.

• Temperature Setting

Under normal working interface, press ▼ or ▲ to adjust the temperature setpoint value, setting range is 5-37 °C , setting step is 0.5 °C , press ▼ to decrease the setting value, press ▲ to increase the setting value, press M to confirm or wait for 8 seconds without any operation, it will return to normal working interface and save the modification automatically.

• Mode Setting

Under normal working interface, press M to switch the working mode among ❄ cooling --> ☀ heating --> 🌬 ventilation in sequence.

• Manual Fan Control

Under Manual Fan Control mode, the fan will run according to the manually fan speed setting.

Cooling Mode :

Room temperature ≤ setting temperature, valve 1 and valve 2 close, fan stops;

Room temperature ≥ setting temperature + temperature hysteresis (E19 parameter), valve 1 opens, valve 2 closes, fan opens.

Heating Mode :

Room temperature ≥ setting temperature, valve 1 and valve 2 close;

Room temperature ≤ setting temperature - temperature hysteresis (E19 parameter), valve 2 opens, valve 1 closes.

Ventilation Mode :

Fan runs normally in accordance with the setting fan speed, valve is forced to close.

Note: The fan output is nothing to do with the setting temperature in ventilation mode)

● Fan Automation

Cooling Mode	a. Room temperature ≤ setting temperature, valve closes automatically, fan stops; b. Room temperature ≥ setting temperature + temperature hysteresis (E19 parameter), fan runs in low speed; c. Room temperature ≥ setting temperature + temperature hysteresis (E19 parameter) + 1°C , fan runs in medium speed; d. Room temperature ≥ setting temperature + temperature hysteresis (E19 parameter) +2°C , fan runs in high speed.
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Note: Fan will operate only if the valve opens.

● Temp. Sensor Error

If temperature sensor does not work, “0.0 ” displays, fan stops and valve closes automatically.

● Fan Voltage Setting

Under shutdown interface, long press M + ⤴ to enter fan voltage setting interface, press M to switch among the parameters and press ⏴ or ⤴ to modify the setting value, press ⏻ to save the modification and exit.

Number	Description	Setting Range	Default	Remark
1	fan low speed	0~10V	4	step:0.1V
2	fan medium speed	0~10V	6	step:0.1V
3	fan high speed	0~10V	8	step:0.1V

● Secret Menu

Under shutdown interface, long press M+ 🔑 to enter Secret Menu, input password 5138, press M to confirm and enter setting interface. Press 🔑 to switch among the parameters and press ⏴ or ⤴ to modify the setting value, press M to save the modification and exit.

Parameter No.	Definition	Setting Range	Default	Remark
E01	Restore Factory Setting	0~99	53	Default 53, change 53 to 55 to restore factory setting.
E02	Power Failure Memory	0~2	01	When power on again: 0: Device will be in shutdown state (“OFF”); 1: Device will be in working interface; 2: Device will remain the last status before power failure.
E03	Screen Brightness	1~5	2	1: Dim, the backlight is all out after standby 2: Low brightness 3: Medium brightness 4: High brightness 5: Always on
E04	Beep Volume	1~5	5	1: OFF 2: Low Beep 3: Medium Beep 4: High Beep 5: Standard Beep
E06	Temp. Upper Limit	0~99	37.0°C	Setting range 0~99
E07	Temp. Lower Limit	0~99	05.0°C	Setting range 0~99
E08	Indoor Temp. Calibration	-9.9~9.9	0.0	Setting range -9.9~9.9
E09	Indoor Humidity Calibration	-20~+20	07	Setting range -20 ~ +20
E10	External Temp. Calibration	-9.9~9.9	0.0	Setting range -9.9~9.9
E11	Function Option of External Temp. Sensor	0~1	0	0: The external temperature sensor functions as a protection sensor. 1: The external temperature sensor functions as a control sensor.
E12	Anti-Freeze Protection Switch	ON / OF	OF	ON: ON OF: OFF Default protection temperature range: (5.0°C - 8.0°C) Anti-Freeze feature is available only in heating mode, it is activated when temperature drops to 5.0°C , when temperature reaches to 8.0°C stops heating.
E13	Fan Mode Option When Indoor Temp. Reaches To Setpoint	ON/OF	OF	ON: Fan keeps low speed OF: Fan turns off
E14	Fan Working Mode	0~3	1	0: Fan works in both Cool and Heat mode 1: Fan works only in Cool mode 2: Fan works only in Heat mode 3: Fan does not work neither in Cool nor Heat mode
E15	Panel Lock	ON/OF	ON	ON: ON OF: OFF

Parameter No.	Definition	Setting Range	Default	Remark
E17	Option For Interval Ventilation Feature	ON/OF	OF	ON: ON OF: OFF
E18	Duration For Interval Ventilation	1~30 (min)	5 (min)	Duration for interval ventilation within 1 hour, unit: minute
E19	Temp. Offset	1.0 - 9.9	1.0°C /2.0 F	
E20	Temp. Unit	0 ~ 1	0	0: Celsius 1: Fahrenheit
E21	Heating Method Selection	0~2	0	0=Activate floor heating only, fan output is controlled by E14 option (default) 1= 2-stage heating mode, floor heating is the primary heat source, fan coil is auxiliary heat source, fan output is no longer controlled by E14 option 2= 2-stage heating mode, fan coil is the primary heat source, floor heating is auxiliary heat source, fan output is no longer controlled by E14 option Note: This option is available only on dual-control system
E22	2-Stage Heating Hysteresis Setting	1.0~9.0	3	Setting range: 1.0 °C ~9.0°C , step: 0.1 Note: This option is available only when the 2-stage heating mode is selected in E21 option. When the difference between the indoor temperature and the set temperature is less than or equal to the set value, the 2nd-stage auxiliary heating output will be activated, otherwise, only the 1st-stage heating output will be activated. This option is available only on dual-control system.

● Z-Wave Operation

● Including & Excluding of Z-Wave network

Under normal display, long press ⤴ + 🔑 to enter interface for inclusion or exclusion of Z-Wave network. Before device included into network, “- - -” will display on the screen. Then press M once, device will enter learning mode to get a node ID. If inclusion is success, a node ID will display on the screen in a few seconds.

A node ID can always inform us whether the device is in the network or not.

Note: Follow the same steps to exclude the device from the network.

● Association Group

AG Identifier	Max Node ID	Command Class	Trigger Situation
0x01	1	COMMAND_CLASS_SENSOR_MULTILEVEL_V5, SENSOR_MULTILEVEL_REPORT_V5	The change between the current detected temperature and the last reported gateway temperature is greater than the value set in parameter 2. The change between the current detected humidity and the last reported gateway humidity is greater than the value set in parameter 3.
		COMMAND_CLASS_THERMOSTAT_MODE_V2, THERMOSTAT_MODE_REPORT	Device Mode changes
		COMMAND_CLASS_THERMOSTAT_OPERATING_STATE, THERMOSTAT_OPERATING_STATE_REPORT	Device Status changes
		COMMAND_CLASS_THERMOSTAT_SETPOINT_V2, THERMOSTAT_SETPOINT_REPORT_V2	Set point value changes
		COMMAND_CLASS_THERMOSTAT_FAN_MODE, THERMOSTAT_FAN_MODE_REPORT	Fan mode changes
		COMMAND_CLASS_THERMOSTAT_FAN_STATE, THERMOSTAT_FAN_STATE_REPORT	Fan status changes
		COMMAND_CLASS_DEVICE_RESET_LOCALLY, DEVICE_RESET_LOCALLY_NOTIFICATION	Restore the factory setting

● Command Class supported by the device:

COMMAND_CLASS_BASIC; COMMAND_CLASS_THERMOSTAT_SETPOINT;
COMMAND_CLASS_THERMOSTAT_MODE; COMMAND_CLASS_THERMOSTAT_FAN_MODE;
COMMAND_CLASS_THERMOSTAT_OPERATING_STATE; COMMAND_CLASS_SENSOR_MULTILEVEL;
COMMAND_CLASS_ASSOCIATION; COMMAND_CLASS_VERSION;
COMMAND_CLASS_MANUFACTURER_SPECIFIC

• Z-Wave Parameter Setting:

Number	Function	Size	Description	Default	Possible Values
1	Temp. Unit	1	Secret menu No. E20: 0: Celsius 1: Fahrenheit	0	0-1
2	Temp. Difference Reporting	2	Unit 0.1°C 0: Disabled 3-255: n *0.1°C automatically report the temperature to the gateway when temperature variation greater than this value	3	0, 3-255
			Unit 0.1F 0: Disabled 3-255: n *0.1F automatically report the temperature to the gateway when temperature variation greater than this value	6	0,3-255
3	Automatic Humidity Value Reporting	1	0: OFF 1-99: Automatically report to gateway when humidity variation greater than this value.	6	0-99
12	Power Failure Memory	1	Secret menu No. E02: When power on again: 0: Device will be in shutdown state (“OFF”); 1: Device will be in working interface; 2: Device will stay the last status before power failure.	2	0-2
13	Backlight Brightness	1	Secret menu No. E03: 1: Dim, when in standby mode, the brightness will be off 2: Low brightness 3: Medium brightness 4: High brightness 5: Always on	2	1-5
14	Beep Set	1	Secret menu No. E04: 1: OFF 2: Low beep 3: Medium beep 4: High beep 5: Standard beep	5	1-5
16	Temp. Upper Limit	1	Secret menu No. E06: Temperature upper limit value	37 (Celsius)	1-99
				98 (Fahrenheit)	
17	Temp. Lower Limit	1	Secret menu No. E07: Temperature lower limit value	5 (Celsius)	0-98
				41 (Fahrenheit)	
18	Indoor Temp. Offset	1	Secret menu No. E08: Temperature offset value (°C or °F) , accuracy 0.1 (n *0.1)	0	(-99~+99) (Celsius)
					(-99~+99) (Fahrenheit)
19	Indoor Humidity Offset	1	Secret menu No. E09: Humidity offset value	0	-20~+20
20	External Temp. Sensor Offset	1	Secret menu No. E10: Temperature offset value (°C or °F) , accuracy 0.1 (n *0.1)	0	(-99~+99) (Celsius)
					(-99~+99) (Fahrenheit)
21	Function Option For External Temp.	1	Secret menu No.E11: 0: External temperature sensor work as high temperature protection detection 1: External temperature sensor work as main control temperature	0	0-1
22	Anti-Freeze Protection Function	1	Secret menu No. E12: 1:ON 0:OFF Default protection temperature range: (5.0°C - 8.0°C) Anti-freeze feature is only valid in heating mode, when temperature drops to 5.0°C , anti-freeze feature is enabled and start heating, when temperature rise to 8.0°C , anti-freeze feature is disabled and stop heating.	0	0-1
23	Fan Mode Option When Idle	1	Secret menu No. E13: 1:Fan speed remain 0: Fan off	0	0-1
24	Fan Working Mode	1	Secret menu No. E14: 0: Fan works in both cooling and heating mode 1: Fan works only in cooling mode 2: Fan works only in heating mode 3: Fan does not work neither in cooling nor heating mode	0	0-3
25	Panel Lock	1	Secret menu No. E15: 1:On 0:Off	1	0-1
27	Option For Interval Ventilation Feature	1	Secret menu No. E17: 1:On 0:Off	0	0-1
28	Duration For Interval Ventilation	1	Secret menu No. E18: Duration for interval ventilation within 1 hour (unit: minute)	5	1-30
29	Temp. Hysteresis	1	Secret menu No. E19: Temperature hysteresis (°C or °F) , accuracy: 0.1	10 (Celsius)	0-99 (Celsius)
				20 (Fahrenheit)	0-99 (Fahrenheit)

1-Year Limited Warranty

We warrant this product to be free from defects in material and workmanship under normal and proper use for one year from purchase date of the original purchaser. We will, at its option, either repair or replace any part of its products that prove defective by reason of improper workmanship or materials. This limited warranty does not cover any damage to this product that results from improper installation, accident, abuse, misuse, natural disaster, insufficient or excessive electrical supply, abnormal mechanical or environmental conditions, or any unauthorized disassembly, repair or modification. This limited warranty shall not apply if: (i) the product was not used in accordance with any accompanying instructions, or (ii) the product was not used for its intended function. This limited warranty also does not apply to any product on which the original identification information has been altered, obliterated or removed, that has not been handled or packaged correctly, that has been sold as second-hand or that has been resold contrary to Country and other applicable export regulations.