MH-F500 Thermostat
User Manual

Introduction

MH-F500 thermostat is used to control up to 3 stages heating and 2 stages cooling system with 8 types control system, EM heat activation, adjustable compressor delay time and O/B changeover. It is with tempered touch sensitive screen, quick connecting terminals to save installer's time. 7days programmable and four modes everyday make users' life convenient and comfortable.

Technical Parameters

- **Power Supply**: AC24V
- **Resistive Load**：＜1A
- **Self-Consumption**: <2W
- **Thermistor**: NTC thermistor
- **Temp. Setting Range**：10-35℃(50~95℉)
- **Precision**：0.1℃(1℉)
- **Outcase**：Tempered glass + PC
- **Dimension**：102*102*20mm
- **Installation**：60mm or 82mm hole pitch
- **Active Element**: Relay switch μ
- **Maximum Transmitting Power**: +3dBm
- **Z-Wave Frequency**: Operating frequency range, defined by the regulatory bodies (for Z-wave in Europe: 868.0 -868.6 MHz, 869.7 - 870.0 MHz)

Features

- Application range: gas/fuel boiler, electric heating, water heating, heat pump etc. 8 types control systems.
- 4.3'' LCM display, touch screen operation interaction.
- Simpler way to connect wires without screw driver.
- 7days 4 time periods scheduling. Set the target heating and cooling temperature respectively.
- Schedule, hold modes for different situations.

■ Declaration of Conformity

Hereby, MCOHome declares 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.
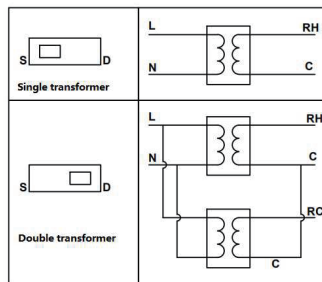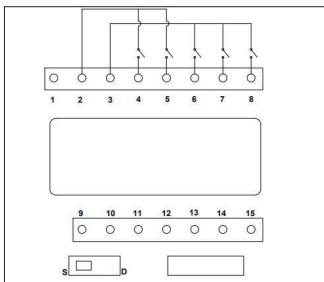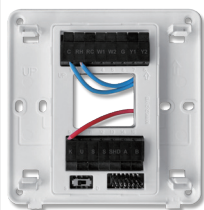
■ Z-Wave Compliance

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

Important Safety Information

⚠ 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!**
Compressor protection is bypassed during testing. To prevent equipment damage, avoid cycling the compressor quickly.

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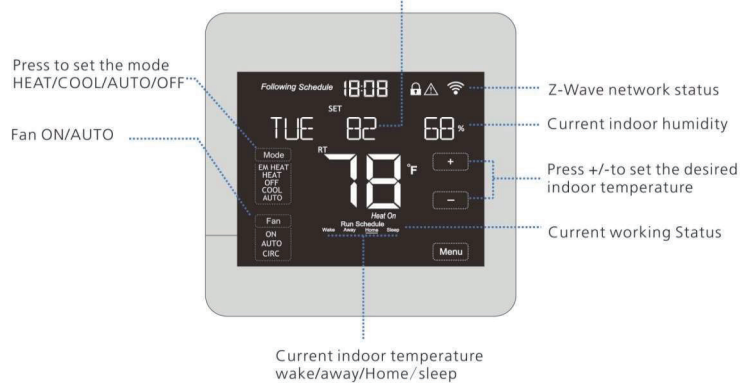
⚠ **MERCURY NOTICE**
If this product is replacing a control that contains mercury in a sealed tube, do not place the old control in the trash. Contact your local waste management authority for instructions regarding recycling and proper disposal.

Wires Connection Instruction

Single transformer

Double transformer

Terminal	Conventional	Heat pump	
1	C	C	
2	Rh	Rh	24V AC power supply
3	Rc	Rc	
4	W1	O/B	Heating or changeover
5	W2	AUX	2nd stage heating or auxiliary heating
6	G	G	Fan
7	Y1	Y1	Compressor stage 1
8	Y2	Y2	Compressor stage 2

Display

Desired indoor temperature

Press to set the mode HEAT/COOL/AUTO/OFF

Fan ON/AUTO

Z-Wave network status

Current indoor humidity

Press +/-to set the desired indoor temperature

Current working Status

Current indoor temperature wake/away/Home/sleep

Functions & Settings

Set system status

System status: EM Heat, Cool, Heat, Off. EM Heat is only used for heat pump system with auxiliary heating.

Change fan status

Press to change the options in the fan status area from Fan On and Fan Auto.

Fan On：The screen displays Fan On. In this status, the fan will be normally on and will be OFF until the device is under OFF status.

Fan Auto: The screen displays Fan Auto. In this status, the fan will be on automatically once the device is heating or cooling. The fan is OFF when the device does not heat or cool.

Set the desired indoor temperature

Press "+"or "-" to set the desired indoor temperature. Setting range: 10~35℃ (50~95℉)
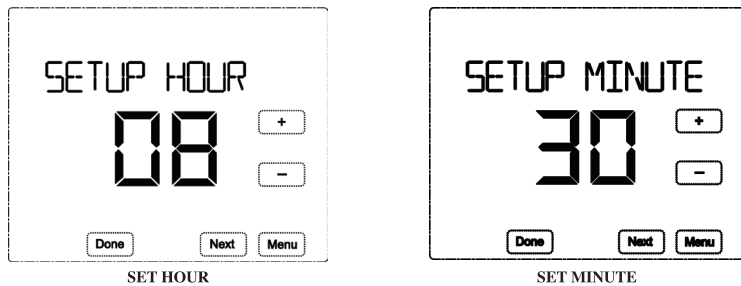
Set time & date

Press "Menu"→"DATE TIME"→"Edit""SETUP YEAR"→"+/-"to change → "Next"→"SETUP DATE"/"SETUP HOUR"/"SETUP MINUTE"→"Done" to save the settings. **By pressing "Menu", the device will return back to the upper level setting interface without storing the changes.** Please check the following figures:

Set working mode

The device provides two modes for the users: Scheduling, Hold
Press "Menu"→"Next" until the displays shows →"WORKING MODE"→"Edit": When the screen shows

SET DATE TIME

SETUP YEAR

SETUP MONTH

SET DATE

7

8

SET HOUR

SET MINUTE

MENU-WORKING MODE

SCHEDULE MODE

HOLD MODE

Z-Wave Configuration

Press "Menu"→"Next"(press twice)→"SETUP Zwave"→"Edit"→"+". Device will enter learning mode to get a node ID. If inclusion is succeeded, a node ID will display on the screen in a few seconds. →Press "Done"

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

"SCHEDULE", press ' ∧ 'or' ∨ 'to switch to "Hold" mode→press "Done" to save the settings and return back to the upper level interface. **By pressing "Menu", the device will return back to the upper level setting interface without storing the changes.** Please check the following figures:

a. When the screen shows "Following Schedule", it represents that the device is working under schedule mode. The device works based on the set time periods and target temperatures during each period. **If pressing +/- to set the desired indoor temperature, this set temperature will be valid only for the current period.**

b.When the screen shows "Hold",it represents that the device is working under hold mode. The device controls to heat or cool based on the desired fixed indoor temperature **until the working mode is changed.**
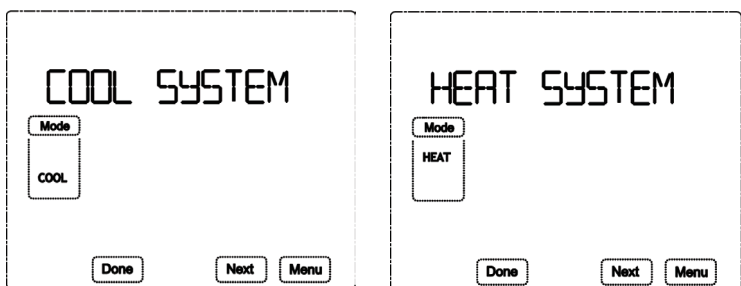
9

SETUP Z WAVE

Z WAVE ID

Z WAVE ID

10

Set schedule
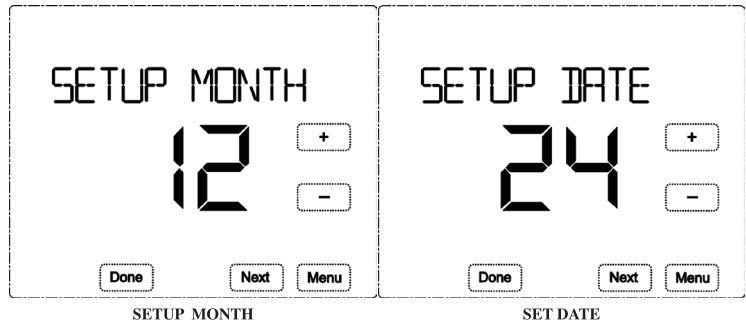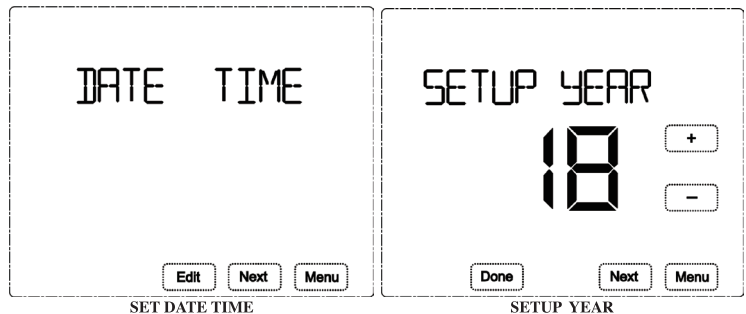
The device provides 4 times periods each day/7days for both heating and cooling status.
Press "Menu"→"Next"(press 3 times)→"SCHEDU SET"→"Edit"→Press to select HEAT or COOL under Mode area to set heating or cooling schedules.→Next→MONDAY 06:00 00（blinking）→"+ or -"to change the 1st period start time→"Next"→78℉(Blinking)→"+ or -"to set the desired temp.→"Next"→08:00 (blinking)→"+ or -"to change the 2nd period start time→"Next"→62℉ (Blinking)→"+ or-"to set the desired temp.→"Next"→18:00（blinking）→"+ or -"to change the 3rd period start time→"Next"→70℉ (Blinking)→"+ or -"to set the desired temp..→"Next"→22:00（blinking）→"+ or -"to change the 4th period start time→"Next"→70℉ (Blinking)→"+ or -"to set the desired temp.→ TUESDAY 06:00...
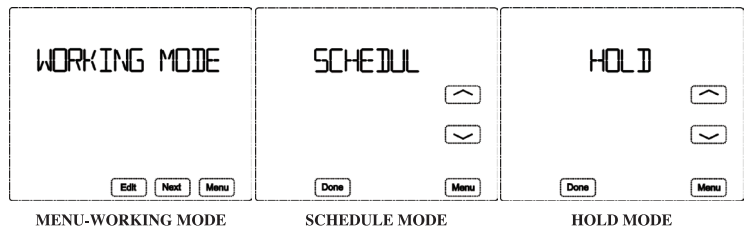
Then follow the same procedure to do the schedule setting. Finally, press "Done" to save all the settings and return back to the main interface. Please check the following figures:
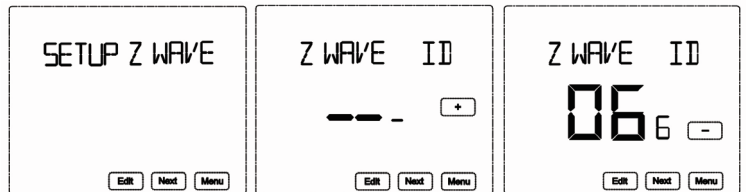

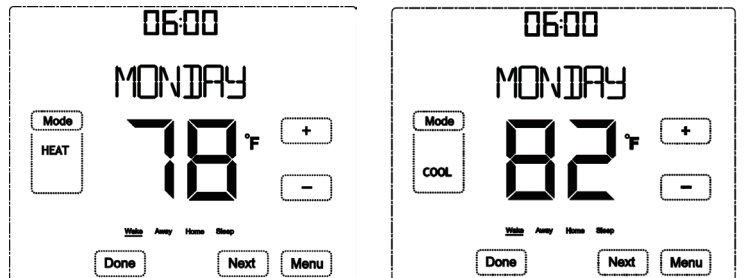**COOL SYSTEM**

HEAT SYSTEM

Schedule for HEAT:
Wake/Away/Home/Sleep Monday to Sunday 7days 4 time periods settings

Schedule for COOL:
Wake/Away/Home/Sleep Monday to Sunday 7days 4 time periods settings

PRE-set time and temp. from factory for the 7days 4 time periods:

WORKING MODE	Wake	Away	Home	Sleep
COOL Mode	6：00　25.5℃ （78℉)	8：00　29.5℃ （85℉)	18：00　25.5℃ （78℉)	22：00　28℃ （82℉)
HEAT Mode	6：00　25.5℃ （78℉)	8：00　29.5℃ （85℉)	18：00　25.5℃ （78℉)	22：00　28℃ （82℉)

11

12

User Setup

Press "Menu"→"Next"(press 4times)→"USER SETUP"

USER SETUP
[Edit] [Next] [Menu]

→"Next"→**Temperature Differencial Value:**Press +/- to set the value added or deleted to make the device display the correct indoor temperature. Range: -10~+10

TEMP ADJ
0 ℃
[+] [−]
[Done] [Next] [Menu]
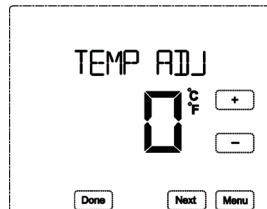
→"Edit"→**Temperature Scale(TEMP SCALE)**：Press +/- to change between ℃ and ℉

TEMP SCALE
℃℉
[+] [−]
[Done] [Next] [Menu]
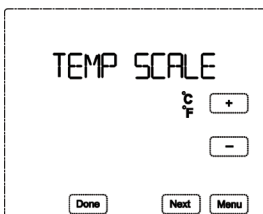
→"Next"→ **Temperature return difference:** Press +/-to set the value added or deleted the value. Range: 0.5~2


TEMP EFF
00 ℉
[+] [−]
[Done] [Next] [Menu]
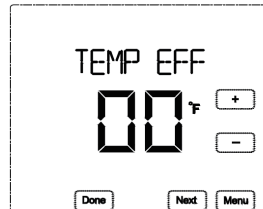
→"Next"→**Brightness:** Press +/- to set the brightness of the screen. 0: Only display current indoor temperature & time in half brightness; 1: Display all contents in half brightness; 2: Display all contents in full brightness.

BRIGHTNESS
01
[+] [−]
[Done] [Next] [Menu]

FAN CIRL
OF
[+] [−]
[Done] [Next] [Menu]

→"Next"→Time synchronization: Press +/-to switch between ON and OFF. ON: Once connected to Z-wave, the device will synchronize the time automatically. OFF:Once connected to Z-wave the device will not synchronize the time. Users need to set by themselves.

TIME SYNC
ON
[+] [−]
[Done] [Next] [Menu]
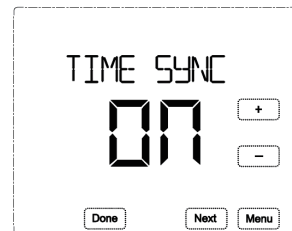
→"Next"→FAN DELAY: Press +/- to set the value OFF/5s/15s/30s.
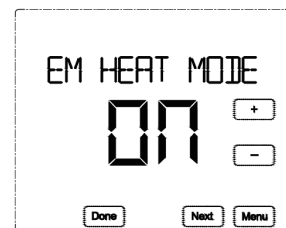OFF: the fan not delay, 5s: the fan will delay 5s,15s: the fan will delay 15s, 30s: the fan will delay 30s.
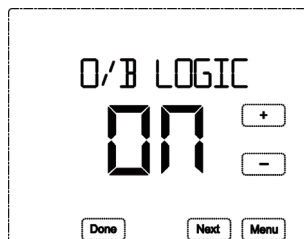
System type:

Conventional Type	0 Single stage cool	1 single stage heat	2 1Heat 1Cool		
Heat pump Type	3 Single stage cool	4 single stage heat	5 2Heat	6 Multi-cool 1Heat	7 Multi-cool 2Heat

O/B Change over logic:

O/B LOGIC
ON
[+] [−]
[Done] [Next] [Menu]

Compressor protect:
Compressor delay time setting from 00 to 10 minutes.

COMP PROTECT
01
[+] [−]
[Done] [Next] [Menu]

EM HEAT MODE:
Emergency heat. Default is OFF. Users can set it to ON so that the thermostat will start EM heat when the outdoor temperature is extremely low so as to protect the outdoor unit.
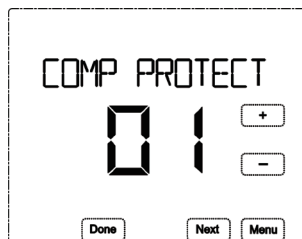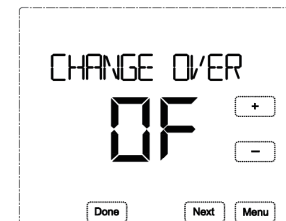

EM HEAT MODE
ON
[+] [−]
[Done] [Next] [Menu]

CHANGE OVER:
When change over is ON, the device will start heating or cooling automatically according to the desired temp. When change over is OFF, the device will not start heating/cooling automatically so as to save energy when there is nobody at home.
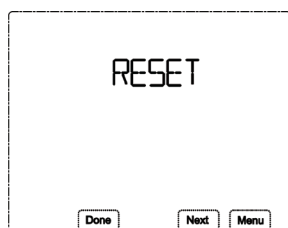

CHANGE OVER
OF
[+] [−]
[Done] [Next] [Menu]

Clean Screen

Press "Menu"→"Next"(press 6times)→"-CLEAN SCREEN"→"Done"

CLEAN SCREEN
[Done] [Next] [Menu]

Then the user will have 30seconds to clean the screen without changing any settings.

CLEAN SCREEN
30

Reset to factory default

RESET
[Done] [Next] [Menu]

Press "Menu"→"Next"(press 7times)→"RESET"→ Press + or - to choose "ON" or "OFF"

Z-Wave Function

1. The device supports S2 function
2. Z-WAVE supported Command Class：

COMMAND_CLASS_ZWAVEPLUS_INFO,
COMMAND_CLASS_VERSION,
COMMAND_CLASS_MANUFACTURER_SPECIFIC,
COMMAND_CLASS_POWERLEVEL,
COMMAND_CLASS_ASSOCIATION,
COMMAND_CLASS_ASSOCIATION_GRP_INFO,
COMMAND_CLASS_SENSOR_MULTILEVEL,
COMMAND_CLASS_THERMOSTAT_SETPOINT,
COMMAND_CLASS_THERMOSTAT_MODE,
COMMAND_CLASS_THERMOSTAT_OPERATING_STATE,
COMMAND_CLASS_THERMOSTAT_FAN_MODE,
COMMAND_CLASS_THERMOSTAT_FAN_STATE,
COMMAND_CLASS_BASIC,
COMMAND_CLASS_TIME,
COMMAND_CLASS_TIME_PARAMETERS,
COMMAND_CLASS_CONFIGURATION,
COMMAND_CLASS_TRANSPORT_SERVICE_V2,
COMMAND_CLASS_SECURITY_2,
COMMAND_CLASS_SUPERVISION,
COMMAND_CLASS_FIRMWARE_UPDATE_MD

Association Group

AG Identifier	Max Node ID	Command Class	Trigger Situation
0x01	1	COMMAND_CLASS_SENSOR_MULTILEVEL_V5, SENSOR_MULTILEVEL_REPORT_V5	When the parameter 2 set to 1,detected temperature change is greater than the value set by parameter 3. When the parameter 2 set to 2,when the report is the interval time is greater than the value set by parameter 4. When the parameter 2 set to 3, the detected temperature change is greater than the value set by parameter 3 or the reported time is greater than the value set by parameter 4.
		COMMAND_CLASS_THERMOSTAT_MODE_V2, THERMOSTAT_MODE_REPORT	Thermostat mode changes
		COMMAND_CLASS_THERMOSTAT_OPERATING_STATE, THERMOSTAT_OPERATING_STATE_REPORT	Thermostat 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

Z-Wave Parameter Setting

Number	Function	Size	Description	Default	Possible Values
1	Automatic Temp Scale Reporting	1	0: Celsius 1: Fahrenheit 2: Follow the main page display	2	0-2
2	Automatic Temperature Value Reporting	1	0: OFF 1: Only report the difference, the current temperature and the last temperature of a certain value to trigger the reporting 2: Regular reporting only 3: Difference reporting + Interval reporting	3	0-3
3	Temperature Difference Setting	2	Unit: 0.1 ℃ Default: 5 5*0.1 ℃ =0.5 ℃	5	3-1000
4	Timed Report Intervals	2	Based on 1s unit, it is recommended to set it above 30s.	30	10-32768
FF	Factory Setting	1	85: Restore factory setting(write only)		85

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.