WME SERIES MODULATING DIGITAL THERMOSTAT

2-pipe/4-pipe Fan Coil Control

APPLICATION

The WME series of Digital thermostats are designed for a 3-speed fan and a motorized valve control in fan coil system. The typical application including:

- 2/4-pipe cool only/heat only/manual changeover
- Ventilation mode
- Manual or automatic 3-speed fan control
- Water valve Modulating control

The WM423 series is also available in Modbus RTU protocol and can be easily integrated into building automation system.

FEATURES

- 2/4-pipe Cooling/ Heating Manual/ Automatic changeover
- Manual or automatic 3-speed fan control
- Option for using NTC10K external Sensor
- Temperature Deviation correction function (offset adjustment)
- Low temperature antifreeze function
- Energy Savings Mode
- Keypad lock options
- Configurable Control Algorithm
- Option for Sleep mode
- Modulating Control (0-10 V dc output)
- RS485 interface in Modbus RTU slave mode for Communicating model

TECHNICAL SPECIFICATIONS

Rated voltage & Frequency	230 VAC±10%, 50/60HZ
Setpoint range	5~45°C step 1°C
Control Accuracy	± 1°C at 25°C
Temperature display resolution	0.1°C
Display range	0~50°C
Built-in/External Temperature Sensor	NTC 10K

Honeywell

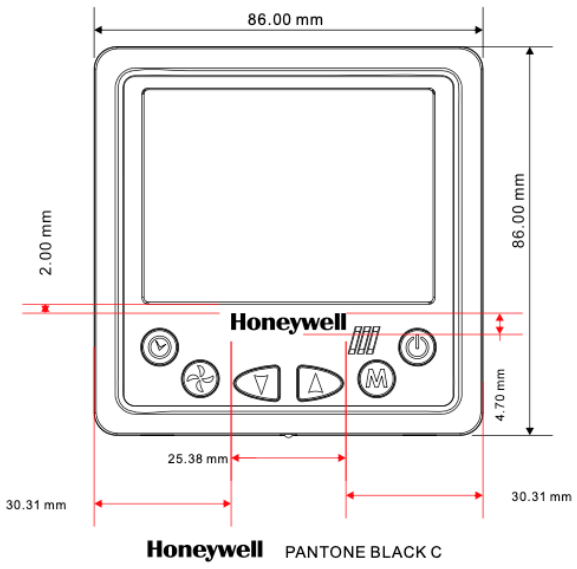
Working current for the whole product	5(3)A 5A: When the load of the thermostat is resistance 3A: When the load of the thermostat is inductance. **For Fan Load:** 3A: when the load is inductance **For Valve Load:** 5A: when the load is resistance
Power consumption	<2W
Backlight	White/Blue
Installation	Install on 86x86x14mm junction box

MODEL SELECTION

PART NUMBER	DESCRIPTION	OPERATING VOLTAGE	APPLICATION	BACKLIGHT	VALVE CONTROL TYPE	COMMUNICATION OPTION
WME423WN/U	230 V AC 2/4 Pipe Modulating Control with Remote Sensor option and Energy Saving mode, White backlight.	230VAC / VAC±10%, 50/60HZ	2/4 Pipe	White	Modulating (0-10V)	None
WME423BN/U	230 V AC 2/4 Pipe Modulating Control with Remote Sensor option and Energy Saving mode, Blue backlight.	230VAC / VAC±10%, 50/60HZ	2/4 Pipe	Blue	Modulating (0-10V)	None
WME423WNM/U	230 V AC 2/4 Pipe, Modulating Control with Modbus and Remote Sensor with Energy Saving mode White backlight.	230VAC / VAC±10%, 50/60HZ	2/4 Pipe	White	Modulating (0-10V)	Modbus
WME423BNM/U	230 V AC 2/4 Pipe, Modulating Control with Modbus and Remote Sensor with Energy Saving mode Blue backlight.	230VAC / VAC±10%, 50/60HZ	2/4 Pipe	White	Modulating (0-10V)	Modbus

PRODUCT DESIGN

THERMOSTAT APPEARANCE



Button:

"ON/OFF" Button: Power on/off.

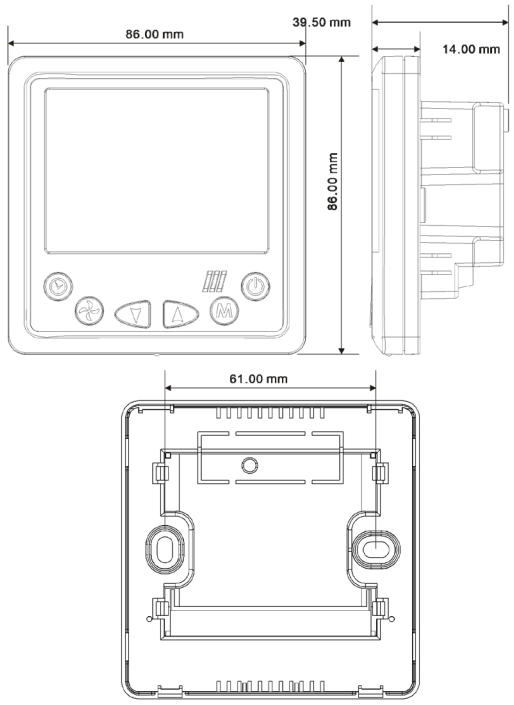
"MODE" Button: Adjustment Mode

"▲" Button: Increase set value (increment of 1°C)

"▼" Button: Decrease set value (increment of 1°C)

"FAN" Button: Adjust fan speed.

TIMER Key: N/A



Output:

Valve control (Cooling): 0 ~ 10V analog electric valve output (Modulation)

Valve control (Heating): 0 ~ 10V analog electric valve output (Modulation)

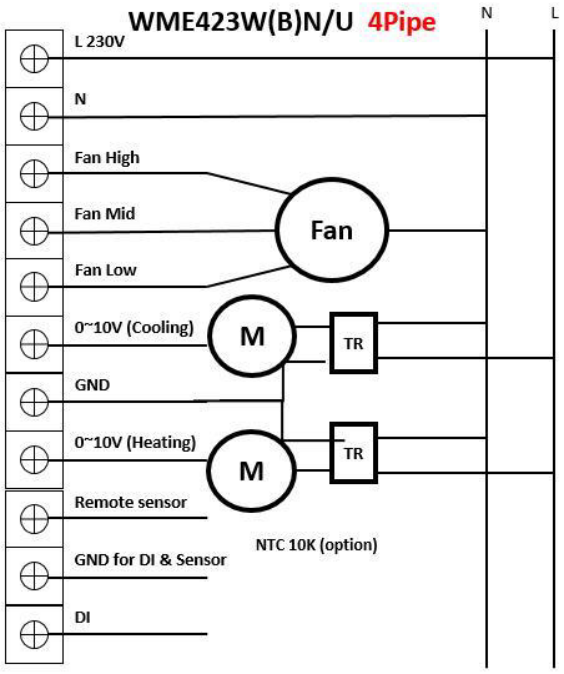
Fan speed: High. (Relay)

Fan speed: Middle. (Relay)

Fan speed: Low. (Relay)

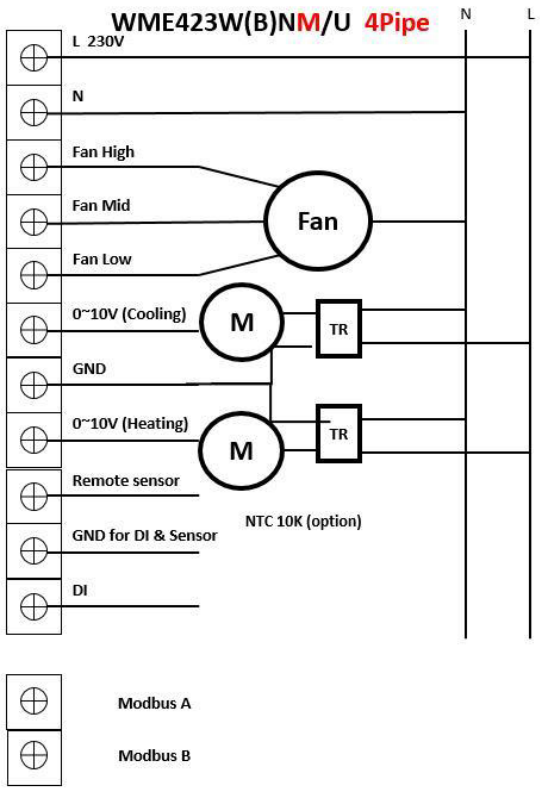
WIRING DIAGRAM

WME423W (B) N/U TERMINAL (4 PIPE)



1	L	230V In
2	N	230V GND
3	Hi	Fan
4	Mid	Fan
5	Low	Fan
6	V1	Cooling valve 0-10V
7	SC	GND for V1 & V2 0-10V
8	V2	Heating valve 0-10V
9	RS	Remote sensor +
10	SC	Remote GND
11	DI	Digital Input +

WME423W (B) NM/U TERMINAL (4 PIPE)



1	L	230V In
2	N	230V GND
3	Hi	Fan
4	Mid	Fan
5	Low	Fan
6	V1	Cooling valve 0-10V
7	SC	GND for V1 & V2 0-10V
8	V2	Heating valve 0-10V
9	RS	Remote sensor +
10	SC	Remote & DI GND
11	DI	Digital Input +
12	M+	Modbus in
13	M-	Modbus out

Terminal size: There are 2 different size of terminals, maximum allowable wire diameter AWG 16 (1.5mm square meter)

FUNCTION

Valve control

Thermostat acquires the room temperature via its integrated sensor or external temperature sensor and maintains the setpoint by delivering modulating valve control commands output.

Fan Operation

Fan can be selected as manual or automatic 3-speed operation. In Manual mode, the fan is switched to the selected speed via control outputs. While in automatic mode, fan speed depends on the difference between room temperature and setpoint. When room temperature reaches setpoint, valve will be closed and meanwhile, fan will be closed either.

Temperature display

The displayed temperature can be set to acquired room temperature or setpoint. The setting can be made during Installer Set-Up process.

Remote temperature sensor

WME Series of Thermostats provide control either depending on the acquired room temperature or depends on the return air temperature. The remote temperature sensor should be of type NTC10K.

Keypad lock

Keypad lock can be set in Installer Setup with default status is all keys available. You may change into mode button locked out, Fan and mode buttons locked out and All buttons locked out by changing the Installer Setup.

Backlight

To turn on the backlight, press any key. The backlight will timeout after the last key is pressed. When in ISU and Installation test mode, the backlight will timeout after the last key is pressed.

OPERATING MODES

The following operating modes are available:

Comfort mode

In comfort mode, the setpoint can be changed by pressing up and down button. Different applications include cool only, heat only and manual heat/cool changeover.

Ventilation mode

Press mode button to enter ventilation mode. In ventilation mode, no output for valve while the fan will operate according to selected fan speed.

Energy Savings mode

A potential-free dry contact such as hotel key card holder or button press can activate the energy savings mode through shorting of DI input terminal, then icon "" appears on the screen.

If the energy saving function is enabled, the setpoint will change to Cool/Heat Preset Energy saving Temperature.

When the DI input terminal is opened, the energy saving function is exited, the energy saving icon "" disappears and the fan speed follows its original condition.

Once the thermostat transitions from energy savings mode to user mode, the temperature will be controlled as per the user set temperature.

SLEEP MODE

Sleep mode can also be activated in the thermostat that regulates the temperature so as to keep the guest comfortable through the different stages of sleep. Whenever the Sleep mode is activated, after 1.5 hours, set temp. will be increased by 0.5°C (for Cool Mode) & deceased by 0.5°C (for Heat Mode) and thereafter, every 30 min. set temp. will be increased/decreased by 0.5°C according to Cool/Heat Mode. Sleep Mode will be deactivated, if power is Off (Switched Off Power Button or Power shut down) or mode is changed (Cool to Heat or Heat to Cool) or the set point temperature is changed by user. Once Sleep Mode is deactivated, temperature will be controlled according to the set temperature.

FREEZING PROTECTION MODE

Freezing protection can be selected as disabled (default) or enabled. In freezing protection mode (no such mode in cool only application), when thermostat is in OFF mode while the acquired temperature is below 6oC, the thermostat will start heat mode until the temperature rises to 8oC or the thermostat is turned on.

ON/OFF MODE

Pressing power button can switch between on and off mode.

FUNCTION

Installer Setup - Press & Hold the "Mode" and " ▼ " Button simultaneously for three seconds to enter into the installation setup. (Also valid during the Keypad lockout).

- Press the " ▲ " or " ▼ " button to change the settings.
- Press Mode button once to move to next parameter/item.
- If not press any button for 10 seconds, display will back to the normal (power-on state).

Installer Setup Settings

ITEM	INSTRUCTION	DEFAULT
1	**Modbus address:** Range: 01~31; Step:1	1 (Will depend on the model)

2	**Set Temp. upper limit** **Range:**(5~45°C); Step:1°C	30°C
3	**Set temp. low limit** **Range:**(5~45°C); Step: 1°C	10°C
4	**Display Temp. Adjustment (offset)** **Range:** (-5 ~ 5°C); Step: 0.5°C	0.0°C
5	**Cool/Heat Mode** 1- Cool / Heat Mode 0- Only cooling mode	1
6	**Fan Operation** 1- Stop the Fan when Temp. Set point is achieved 0- Never Stop the Fan	0
7	**Two/ Four pipe selection:** 1- Four Pipe 0- Two Pipe	0 or 1
8	**Power on States:** 1-On states 0-Off States	0
9	**Low Temp. freeze-proofing function:** 1- ON 0- OFF	0
10	**Sensor:** 1- Remote sensor 0-Built-in sensor	0
11	**Keypad Lockout** 1- All buttons available 2- Only Mode button locked out 3- Fan & Mode buttons locked out 4- All buttons locked out	1
12	**DI (Digital Input):** 1- Remote ON/OFF 0- Energy saving mode	0
13	**Cool energy-saving Temp.** **Range:**(25~30°C) Step:1°C	25°C
14	**Heat energy-saving Temp.** **Range:**(10~20°C) Step:1°C	15°C
15	**PI Sampling time setting** **/Cooling Valve:** TF1: Range:1~50s	1
16	**Cooling Valve setting range:** KP1:Range:10~100	10
17	**ZBAND1:** 0.0~9.9	zero
18	**PI Sampling time setting** **/Heating Valve:** TF2: Range:1~50s	1
19	**Heating Valve setting range :** **KP2:**Range:10~100	10
20	**ZBAND2:**0.0~9.9	zero
21	Diff. 0.0~9.9	Not Applicable

COMMUNICATING(OPTION)

When the thermostat is integrated into building automation system, you can make configuration by referring to the table given below:

COMMUNICATION FORMAT	
Protocol	Modbus RTU
Baud rate	9600
Parity	None
Error checking mechanism	CRC

MODBUS ADDRESS TABLE

ADDRESS	CONFIGURATION PARAMETERS	DEFAULT VALUE	RANGE(DEC)	UNIT	STEP	R/W	DECIMAL
0001	On / off status	0	0/1		1	R/W	NA
0:OFF 1:ON							
0002	Room Temp.		0.0~60.0	°C		R	Decile
Notes: The read value is ten times the actual value							
0003	Set Temp.	25°C	5~45	°C	1	R/W	Integer
Note: the temperature setting value needs to be magnified by ten times when R/W, Through Modbus, all input value calculation will be divided by 10 and rounded down to nearest whole number.							
0004	Fan Status	1	1--7		1	R/W	NA
Definition: 1-LOW 2-MID 3-HIGH 4-AUTO HIGH 5-AUTO MID 6-AUTO LOW 7-AUTO STOP. Note: 1-4 (R/W) 5-7(R)							
0005	System Mode	1	1~4		1	R/W	NA
1-Cooling 2- Heating 3-Ventilation 4-Auto							
0006	V1 O/P (Cooling)		0~10			R	Decile
0-10V							
0007	ON/OFF status after power on	0	0-1			R/W	NA
0:OFF 1:ON							
0008	V2 O/P (Heating)		0~10			R	Decile
0-10V							
0009	OFFSET Setting	0	-5.0~5.0	°C	0.5	R/W	Decile
Low bytes: Negative 0x9C(-10.0)~0xFF, Positive 0x00~0x64(10.0) Hight bytes: 0x00							
0010	Upper Temp. limit	30	5~45	°C	1	R/W	NA
Note: The read value is ten times the actual value							
0011	Low Temp Limit	10	5~45	°C	1	R/W	NA
Note: The read value is ten times the actual value							
0012	Keypad Lock	0	1,2,3,4		1	R/W	NA
1: All button available 2: when Only Mode button locked 3: when Only Mode button locked out 4: when All buttons locked out.							
0013	DI function Option:		0/1			R/W	NA
0:ECO 1: Switch							
0014	DI Status		0/1			R	NA
0:Disconnect 1:Short							

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