

MTC model with air sensor, floor sensor and dry contact

MTC is an electronic heating thermostat designed to be installed in a standard single gang electrical box with a minimum width of 2-1/4". This thermostat has an adjustable dial which can be set to maintain a floor temperature or to maintain an air temperature depending on the particular model. This electronic thermostat can be used for either hydronic or electric radiant applications.

Warning, the thermostat should not be energized until the system is installed according to these instructions and the installation meets all applicable codes. Warranty is void if not installed according to the instructions and proper procedure.

APPROVALS (for only 120 & 240V versions)

MTC models 120 & 240V thermostats are UL and cUL listed and meet UL8730-1 and UL8730-2-9 standards.

STANDARDS APPLIED / CLASSIFICATION (24V models)

EN 50 081-1, EN 50 082-2, and EN 60730-2-9. The product is a class III device and the product **must** be connected to a low voltage 24 volt transformer.

CE MARKING

OJ declares under their own responsibility that this product meets the requirements of the European Council's directive 89/336 and successive modifications as to electro-magnetic compatibility and the Council directive 73/23 as to electrical equipment to be applied within certain voltage ranges.

Thermostat Models	Power Supply (Volt)			Sensor	
	24	120	240	Air	Floor
MTC1991			•		•
MTC1999			•	•	
MTC2991		•			•
MTC2999		•		•	
MTC3991	•				•
MTC39994	•			•	

TECHNICAL DATA

Power supply (model dependent):	24, 120, 240 Vac ±10%, 60Hz
Power consumption:	3A
Necessary pulled wires:	4 wires (model dependent)
Built-in switch (terminals 3&4)	-2 pole, 16A, 120&240V version -dry contact for 24V version
Output Relay, (Terminals 3&4):	SPST, 16A, (2A 24V version)
Ambient Operating Temperature:	32-122°F (0-50°C)
Settable Temperature:	50-122°F (10-50°C)
Temperature Setback:	Not available
On/Off differential:	0.7°F (0.4°C)
Dimensions: (HxWxD)	4.5"x 3.3"x 2.0"

INSTALLATION OF FLOOR SENSOR (model dependent)

The floor sensor should be installed within a conduit and placed as high as possible to the finished floor. The sensor is UL and cUL approved regarding the isolation test. The floor sensor wire can be extended with 18 gauge wire up to a length of 150ft (50m). The resistance of the extended wire shall not exceed 20 ohms. The sensor wires should be kept within a separate conduit to ensure protection from damage during installation. If shielded wire is used, it must not be grounded but connected to terminal 6 on the thermostat.

LED and ON/OFF SWITCH

When there is a 'call' for heat, the LED on the thermostat will illuminate. The LED will also aid in trouble shooting the thermostat. (Refer to trouble shooting section) Located to the left side on the front of the thermostat is an ON/OFF switch, that powers the thermostat.

ERROR DETECTION (floor sensing model only)

The electronic thermostat has a built-in error detection, which will de-energize the heating circuit if the sensor is damaged or if it detects an open or shorted sensor circuit.

THERMOSTAT INSTALLATION

1. Remove thermostat knob, noting the position (A)
2. Loosen screw to remove frame and cover (B)
3. Attach wiring from the rear of the thermostat according to the wiring diagrams on page 2 of the installation.
4. Mount thermostat in a single gang electrical box, minimum width of 2-1/4".
5. Re-install the frame, cover, and reposition the knob onto the thermostat. Note, the knob has several grooves for repositioning onto the thermostat.

TEMPERATURE SETTING /ADJUSTMENT

Adjust the temperature knob to the desired room or floor temperature, if after a few days you find the temperature to be different from the setting. Adjustment can be made as follows: Measure the room temperature with a thermometer, remove the knob without rotating it, then reposition the knob according to the measured temperature on the scale and reinstall the knob.

MINIMUM / MAXIMUM TEMPERATURE LIMITATIONS

Behind the knob there are red and blue locking rings held in position by a screw. To set the limitations, loosen the screw (C) seen in Figure 1, and adjust the red limit ring to the desired maximum, and the blue to the desired minimum temperature. Replace the knob to the exact position as it was removed.

INSTALLATION AND WIRING OF THERMOSTAT

CAUTION: Disconnect all electrical power prior to installing or servicing this unit. Wiring of the thermostat must meet all applicable codes.

Remove the knob (A) from the front plate and loosen the flat head screw (B) to remove the frame and the front cover as seen in Figures 1&2. Refer to the appropriate model type for proper wiring.

MTC399 models (24 Volt version):

Terminals 3 and 4 are for a dry contact (not powered) and will close when the thermostat 'calls' for heat.

Wiring (24 Volt version, refer to Figures 3&4)

Terminals	Connections
1	Line- 24Vac Transformer
2	Neutral from Transformer
3	Wiring to external 24V relay or electronic actuator *
4	
5	Floor sensor (model dependent)
6	

* If the relay or electronic actuator used is not powered, it may be necessary to place a jumper between terminals 2 and 3. Verify this with a volt meter. Note the maximum power allowed is 2A.

MTC199 and MTC299 (120 and 240V versions):

Terminals 3 and 4 is a powered internal contact and will be energized when the thermostat 'calls' for heat.

Wiring (120 & 240V versions, refer to Fig. 5&6)

Terminals	Connections
1	Line- 120 or 240V supply
2	Neutral from supply
-	Connection for ground
3	Wired to circulator or heating element
4	
5	Floor sensor (model dependent)
6	

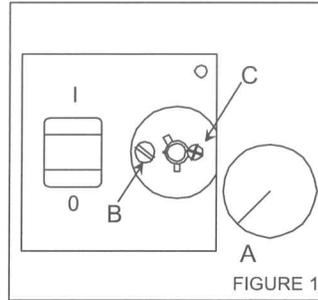


FIGURE 1

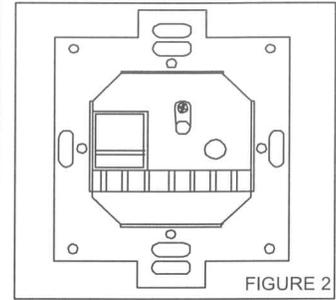


FIGURE 2

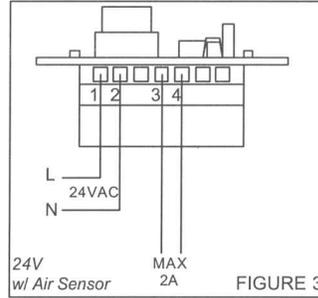


FIGURE 3

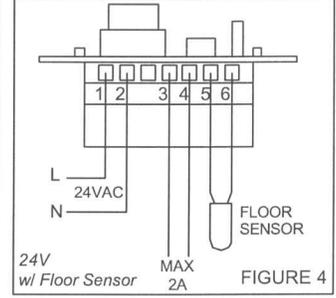


FIGURE 4

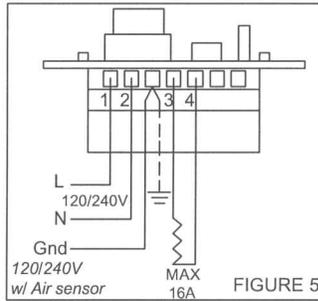


FIGURE 5

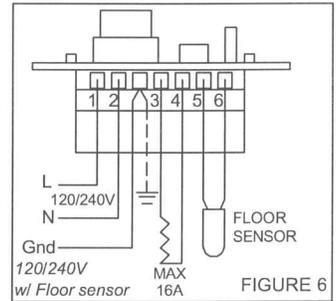


FIGURE 6

RESISTANCE vs. TEMPERATURE READING

When testing the resistance of the floor sensor, power should not be supplied to the thermostat. The approximate corresponding resistance for the temperature range of 60-75°F (16-24°C) is 1.8 - 1.35 kOhms respectively.

TROUBLESHOOTING

Problem	Cause / Reason	Solutions
Red light blinks	<ul style="list-style-type: none"> Floor sensor is not wired Malfunctioning floor sensor 	<ul style="list-style-type: none"> Wire floor sensor to the thermostat and check for continuity. With no power to the thermostat check floor sensor for continuity.
No activity from thermostat	<ul style="list-style-type: none"> Lack of power to the thermostat Thermostat not on 	<ul style="list-style-type: none"> Check power source and wiring to the thermostat Flip the power switch to the thermostat on The thermostat may be defective and need replacing
Lack/ Excessive heat	<ul style="list-style-type: none"> Misplacement of floor sensor Terminals 3&4 not wired properly Misplacement of floor sensor 	<ul style="list-style-type: none"> Ensure floor sensor is in appropriate place as indicated in instructions For 24V version a jumper may be necessary between terminals 3&4 to power actuator or relay, refer to wiring instructions Ensure floor sensor is in appropriate place as indicated in instructions

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