

EMM-3 Electronic MiniZone™ Panel

PRODUCT DATA



FEATURES

- Uses any Honeywell four-wire thermostat.
- Optional C7735 Discharge Air Temperature Sensor for capacity control.
- SYSTEM and ZONE damper status LEDs indicate system status.
- Automatic zone changeover with 20-minute changeover timer.
- Individual zone fan control.
- Thermal circuit breaker protects panel and transformer from damage if miswired.
- Purge timer protects equipment between calls for heating and cooling.
- Uses spring-open/power-closed, spring-closed/power-open, and power-open/power-closed dampers.
- Interfaces with single or dual transformer equipment.

APPLICATION

The EMM-3 Electronic MiniZone™ Panel controls single-stage heat/cool equipment and is used on two- and three-zone applications.

For Internet access:

www.honeywell.com/yourhome/zoning/zoning_home.htm

For technical support: call 1-800-828-8367.

To download Zoning literature:

<http://hbctechlit.honeywell.com>

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SPECIFICATIONS

Input Ratings: Discharge Air Temperature Sensor (DATS):
24000 to 1600 ohms.

Output Ratings:

Equipment Relays and Zone Relays:
1.5A run, 3.5A inrush, 200,000 cycles (30 Vac).
1.5A run, 7.5A inrush, 100,000 cycles (30 Vac).

Humidity Ratings: 5% to 90% RH non-condensing.

Temperature Ratings:

Shipping: -20° to 120°F.
Operating: -40° to 150°F.

LED:

SYSTEM LED: Used to communicate equipment status:

- Red: Heat mode.
- Green: Cool mode.
- Orange: Purge mode.
- Flashing Red: System exceeds high DATS input.
- Flashing Green: System exceeds low DATS input.
- Flashing Orange: No DATS or DATS failure.
- Off: Idle mode or Fan mode.

ZONE LED (3): Used to communicate damper status:

- Green: Dampers are opening or open.
- No Color: Dampers are closing or closed.

Finish: White.

Dimensions: See Fig. 1.

Mounting: Mounting screws provided.

Wiring: 18 gauge wire for all equipment and system connections.

Wiring Connections:

Thermostat: R-C-W-Y-G.
Dampers: M6 (Closed); M4 (Open); M1 (Common).
Discharge Air Temperature Sensor: ZMS-ZMS.
Transformer: R-C.
Equipment: RC-RH-Y-W-G.

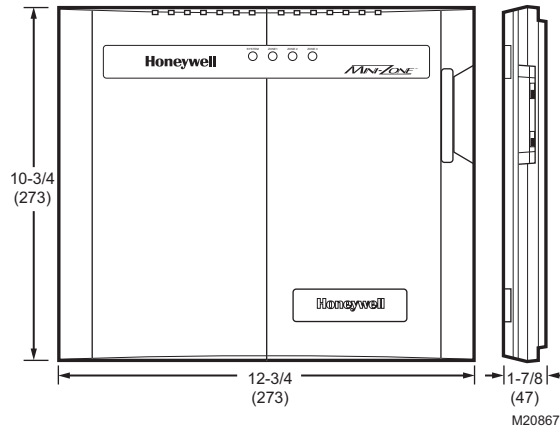


Fig. 1. EMM-3 dimensions in in. (mm).

Approvals:

Federal Communications Commission: Class B.
NEMA DC-3: Not required.

Thermostats:

Any Honeywell four-wire thermostat.

ORDERING INFORMATION

When purchasing replacement and modernization products from your TRADELINE® wholesaler or distributor, refer to the TRADELINE® Catalog or price sheets for complete ordering number.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:

1. Your local Home and Building Control Sales Office (check white pages of your phone directory).
2. Home and Building Control Customer Relations
Honeywell, 1885 Douglas Drive North
Minneapolis, Minnesota 55422-4386

In Canada—Honeywell Limited/Honeywell Limitée, 35 Dynamic Drive, Scarborough, Ontario M1V 4Z9.

International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.

Table 1. Recommended Thermostats.

Logo	Standard Thermostats	Programmable Thermostats
Honeywell	T87F1859 and Q539A1014 T87F3855 and Q539A1469 T8400C1024 T8401C1015 T8501D1046	T8000C1002 T8001C1001 T8600D2069 T8601D2019 T8602D2018 PC8900A1007 and W8900A1004
Trol-A-Temp	—	T8601D2027

Dampers:

Power-open/power-closed.
Spring-open/power-closed.
Spring-closed/power-open.
See Table 2 for recommended dampers.

Table 2. Recommended Dampers.

Honeywell Damper Type	Round	Rectangular
Power-open/power closed	MARD	D643 using ML6161 Motor Actuator
Spring-open/power-closed	ARD	ZD

Accessories: For required accessories, see Table 3.

Table 3. Required Accessories.

Accessory	Description	
40 VA transformer	AT140D1046	
Capacity protector	DATS C7735A1000	
Round static pressure regulator damper	7 SPRD	300 cfm
	8 SPRD	400 cfm
	9 SPRD	600 cfm
	10 SPRD	750 cfm
	12 SPRD	1200 cfm
	14 SPRD	1800 cfm
Rectangular static pressure regulator damper	16 SPRD	2400 cfm
	12 x 8 SPRD	1000 cfm
	12 x 10 SPRD	1200 cfm
	12 x 12 SPRD	1400 cfm
	20 x 8 SPRD	1600 cfm
	20 x 10 SPRD	2000 cfm
	20 x 12 SPRD	3000 cfm

INSTALLATION

Mounting

⚠ CAUTION

Equipment Damage Hazard.
Do not mount EMM-3 inside HVAC equipment.
 Mount only on wall or on cold air return.

1. Mount the thermostats in each zone of the living space using the installation instructions provided with each thermostat. See Fig. 2.
2. Mount the dampers in the ductwork using the installation instructions provided with each damper.
3. Mount the EMM-3 zone panel near the HVAC equipment; locate it on a wall or on the cold-air return.
4. Level the EMM-3 for appearance only.

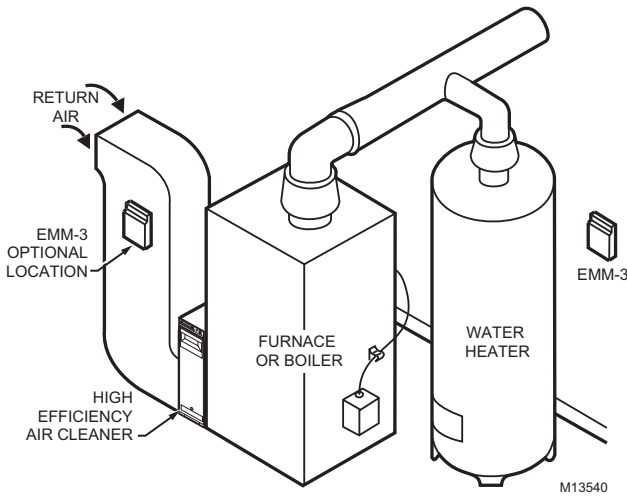


Fig. 2. EMM-3 mounting location.

Wiring

Wiring must comply with applicable codes, ordinances, and regulations.

See Fig. 3-6 for wiring diagrams.

⚠ CAUTION

Voltage Hazard.
Can cause electrical shock or equipment damage.
 Disconnect power before beginning installation.

1. Connect 24 Vac transformer to R and C terminals on EMM-3.
2. Connect HVAC equipment to R_C, R_H, W, Y and G terminals on EMM-3. (Use jumper between R_C and R_H if using single equipment transformer.)
3. Connect the dampers for zone 1, 2 and 3 to EMM-3. See instructions packed with dampers.

4. Connect the zone 1 thermostat to EMM-3.
5. Reconnect power to EMM-3.
6. Check out connections made in steps 1 through 5:
 - a. If system is in Purge mode, press PURGE OVERRIDE on EMM-3.
 - b. Set Zone 1 thermostat to call for heat:
 - (1) Zone 1 damper is open. Zone 1 LED on EMM-3 is green.
 - (2) Zones 2 and 3 dampers are closed. Zones 2 and 3 LED on EMM-3 are off.
 - (3) Heating equipment is activated. SYSTEM LED is red.

	System	Zone 1	Zone 2	Zone 3
LED	Red	Green	Off	Off
System Operation	Heat on	Open	Closed	Closed

- (4) Continue wiring the system.

⚠ CAUTION

Voltage Hazard.
Can cause electrical shock or equipment damage.
 Disconnect power before continuing installation.

7. Connect Zone 2 thermostat to EMM-3.
8. Reconnect power to EMM-3.
9. Check out connections made in steps 1 through 8:
 - a. If system is in Purge mode, press PURGE OVERRIDE on EMM-3.
 - b. Set Zone 2 thermostat to call for heat, set Zone 1 thermostat to off:
 - (1) Zone 2 damper is open. Zone 2 LED on EMM-3 is green.
 - (2) Zones 1 and 3 dampers are closed. Zones 1 and 3 LED on EMM-3 are off.
 - (3) Heating equipment is activated. SYSTEM LED is red.

	System	Zone 1	Zone 2	Zone 3
LED	Red	Off	Green	Off
System Operation	Heat on	Closed	Open	Closed

- (4) Continue wiring the system.

⚠ CAUTION

Voltage Hazard.
Can cause electrical shock or equipment damage.
 Disconnect power before continuing installation.

10. Connect zone three thermostat to EMM-3.
11. Reconnect power to EMM-3.
12. Check out connections made in steps 1 through 11:
 - a. If system is in Purge mode, press PURGE OVERRIDE on EMM-3.
 - b. Set Zones 1 and 2 thermostats to Off.
 - c. Set Zone 3 thermostat to call for heat.

- (1) Zone 3 damper is open. Zone 3 LED on EMM-3 is green.
- (2) Zone 1 and 2 dampers are closed. Zone 1 and 2 LED on EMM-3 are off.
- (3) Heating equipment is activated. SYSTEM LED is red.

	System	Zone 1	Zone 2	Zone 3
LED	Red	Off	Off	Green
System Operation	Heat on	Closed	Closed	Open

- (4) Continue wiring the system.

 **CAUTION**

Voltage Hazard.
Can cause electrical shock or equipment damage.
 Disconnect power before continuing installation.

- 13. Reconnect power to EMM-3.
- 14. Continue troubleshooting system in Cool mode.
 - a. Set Zone 1 thermostat to Cool mode and Zones 2 and 3 thermostats to off.
 - b. Zone 1 damper is open. Zone 1 LED on EMM-3 is green.
 - c. Zones 1 and 3 dampers are closed. Zones 2 and 3 LED on EMM-3 are off.
 - d. Cooling equipment is activated. SYSTEM LED is green.

	System	Zone 1	Zone 2	Zone 3
LED	Green	Green	Off	Off
System Operation	Cool on	Open	Closed	Closed

- e. Repeat procedure for zones 2 and 3. Continue wiring the system.

 **CAUTION**

Voltage Hazard.
Can cause electrical shock or equipment damage.
 Disconnect power before continuing installation.

- 15. Reconnect power to EMM-3
- 16. Check out fan operation.
 - a. Set Zone 1 thermostat fan switch to On, and Zones 2 and 3 thermostats to Auto.
 - b. Zone 1 damper is open. Zone 1 LED on EMM-3 is green.
 - c. Zones 2 and 3 dampers are closed. Zones 2 and 3 LED on EMM-3 are off.
 - d. Fan equipment is activated. SYSTEM LED is off.

	System	Zone 1	Zone 2	Zone 3
LED	Off	Green	Off	Off
System Operation	Fan on	Open	Closed	Closed

- e. Repeat procedure for zones 2 and 3. Continue wiring the system.

 **CAUTION**

Voltage Hazard.
Can cause electrical shock or equipment damage.
 Disconnect power before continuing installation.

- 17. Connect DATS Sensor to EMM-3 (optional).
 - a. Reconnect power to EMM-3.
 - b. If system is in Purge mode, press PURGE OVERRIDE on EMM-3.
 - c. Verify SYSTEM LED is no longer flashing. This confirms proper DATS operation. (Flashing occurs in Idle and Fan modes only.)

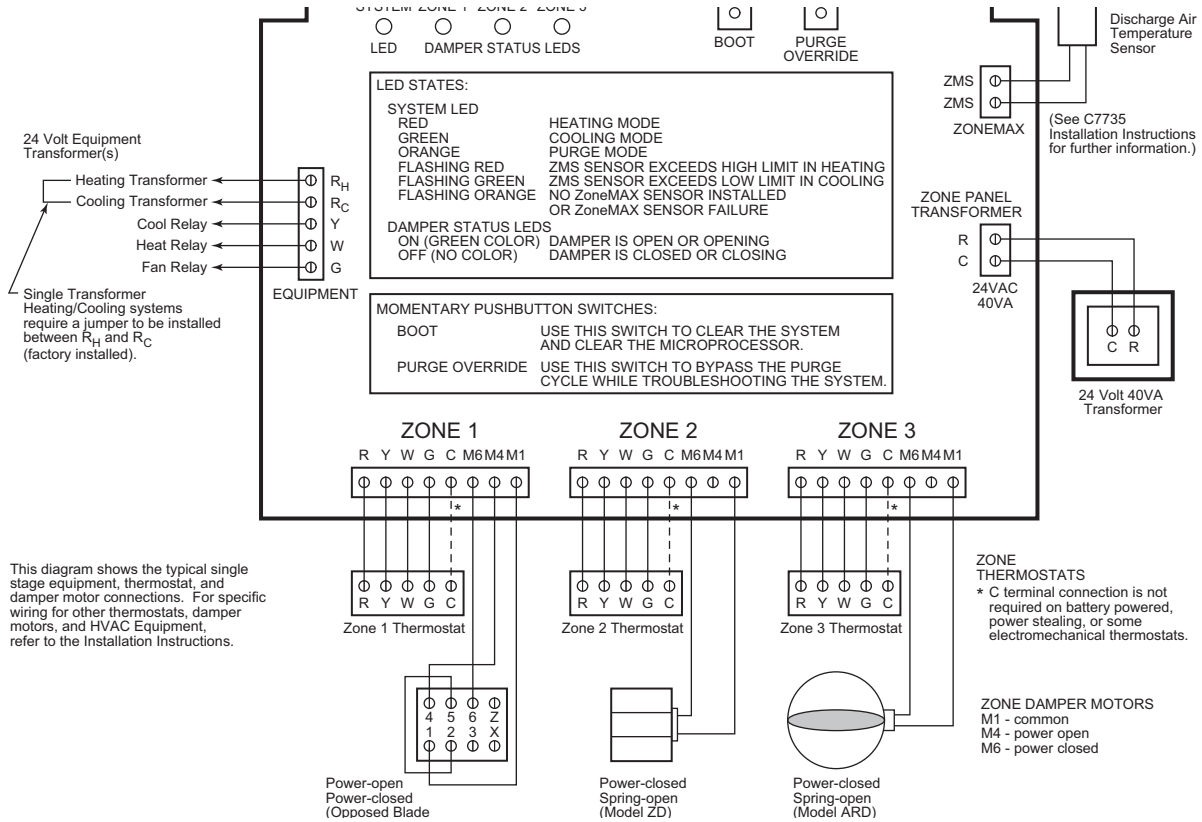


Fig. 3. EMM-3 system wiring diagram.

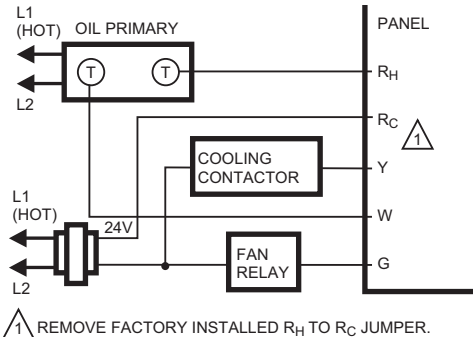


Fig. 4. EMM-3 oil heating, electrical cooling wiring diagram.

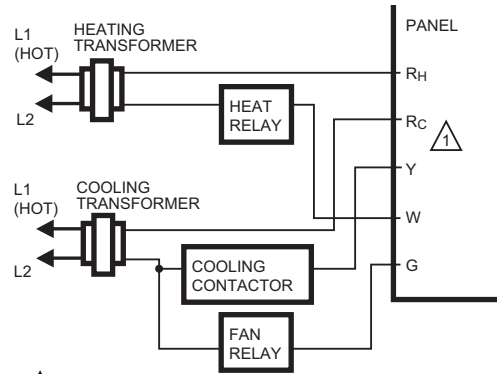


Fig. 5. Two-transformer system wiring diagram.

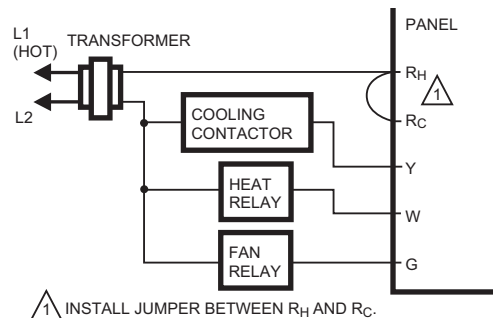


Fig. 6. Single transformer system wiring diagram.

STARTUP AND CHECKOUT

After the installation is complete, check to be sure the system is working properly. See Table 4 for sequence of operation.

Table 4. Trol-A-Temp Electronic MiniZone Panel Sequence Of Operation.

LED	Device	Terminals Energized	System Action	Comments
INITIAL POWERUP				
SYSTEM (orange)	Panel	G (fan)	System enters Purge mode for 2-1/2 minutes.	See Purge mode.
	Damper	M4	Damper(s) open to all zones.	
IDLE MODE				
SYSTEM (off)	Panel	None	No call for heating or cooling.	Equipment terminals are not energized. If SYSTEM LED flashes orange, DATS is not connected or is out-of-range.
PURGE MODE				
ZONE (orange)	Thermostat	None	Damper from last zone to call remains open; all others remain closed for 2-1/2 minutes after thermostat call ends. After 2-1/2 minutes, if no other call for heating or cooling is required, all dampers open.	Panel enters Purge mode after each call for heat and cool; this allows heat exchanger to dissipate more conditioned air into the zone.
	Damper	M4		
	Panel	G (fan)		
ZONE 1 INITIATES CALL FOR HEAT				
SYSTEM (red) Zone 1 (green).	Thermostat	W (heat)	Zone 1 thermostat calls for heat. Zone 1 damper(s) remains open. Zones 2 and 3 dampers close. Panel calls for heat.	Heat is delivered only in zone 1. When another zone calls for heat while zone 1 is calling, that zone damper opens. For electric heat applications, use thermostat that calls for fan with all calls for heat.
	Damper	Zone 1: M4 Zones 2 and 3: M6		
	Panel	W (heat)		
ZONE 1 ENDS CALL FOR HEAT				
SYSTEM (orange)	Thermostat	None	System enters Purge mode. Damper(s) from zone 1 remains open; all others remain closed for 2-1/2 minutes after zone 1 thermostat call ends. After 2-1/2 minutes, all dampers open (M4 energized).	None.
	Damper	Zone 1: M4. Zones 2 and 3: M6.		
	Panel	G (fan)		
ZONE 1 INITIATES CALL FOR COOL				
SYSTEM (green). Zone 1 (green).	Thermostat	Y (cool) G (fan)	Zone 1 thermostat calls for cool and fan. Zone 1 damper(s) remains open. Zones 2 and 3 dampers close. Panel calls for cool and fan.	Cool is delivered only to zone 1. If another zone calls for cool while zone 1 is calling, the damper to that zone opens. In retrofit applications, where only three wires are available, Y signal from thermostat activates Y and G call from panel
	Damper	Zone 1: M4. Zones 2 and 3: M6.		
	Panel	Y (cool). G (fan).		
ZONE 1 ENDS CALL FOR COOL				
SYSTEM (orange)	Thermostat	None	System enters Purge mode. Damper(s) from zone 1 remains open; all others remain closed for 2-1/2 minutes after zone 1 thermostat call ends. After 2-1/2 minutes, all dampers open (M4 energized).	None.
	Damper	Zone 1: M4. Zones 2 and 3: M6.		
	Panel	G (fan)		

Table 4. Trol-A-Temp Electronic MiniZone Panel Sequence Of Operation. (Continued)

LED	Device	Terminals Energized	System Action	Comments
ZONE 1 CALLS FOR FAN				
Zone 1 (green). Zones 2 and 3 (off). SYSTEM (off).	Thermostat	G (fan)	System fan is energized.	When a call for cool is made, panel adjusts dampers and activates equipment as directed. When a call for heat is made, fan stays energized for two minutes of heat call. When fan call ends, Idle mode is entered.
	Damper	Zone 1: M4. Zones 2 and 3: M6.	Zone 1 damper(s) remains open; all others close.	
	Panel	G (fan)		
DATS TEMPERATURE EXCEEDS 160° (71°C) IN ZONE 1 CALL FOR HEAT				
SYSTEM (flashes red)	Thermostat	W (heat)	Thermostat continues to call for heat, but panel ignores call.	After 2-1/2 minutes and more than 10°F (-12°C) temperature drop, the panel returns to Heat mode (if call still exists), delivering heat to zone 1 and any other zone calling for heat. Fan stays on first two minutes of heat call.
	Damper	Zone 1: M4. Zones 2 and 3: M6.	Damper(s) from zone 1 remains open; all others are closed.	
	Panel	G (fan)	Panel activates system fan for 2-1/2 minutes and until DATS temperature drops more than 10°F (-12°C).	
DATS TEMPERATURE FALLS BELOW 44°F (6°C) IN ZONE 1 CALL FOR COOL				
SYSTEM (flashes green)	Thermostat	Y (cool) G (fan)	Thermostat continues to call for cool and fan, but panel ignores cool call.	After 2-1/2 minutes and more than 10°F (-12°C) temperature rise, the panel returns to Cool mode (if call still exists), delivering cooling to zone 1 and any other zone calling for cool.
	Damper	Zone 1: M4. Zones 2 and 3: M6.	Damper(s) from zone 1 remains open; all others are closed.	
	Panel	G (fan)	Panel activates system fan for 2-1/2 minutes and until DATS temperature rises more than 10°F (-12°C).	
AFTER BOOT BUTTON IS PRESSED				
SYSTEM (orange)	Panel	G (fan)	System enters Purge mode for 2-1/2 minutes.	See Purge mode.
	Dampers	M4	Dampers to all zones open.	
PURGE OVERRIDE BUTTON IS PRESSED				
None	Panel	None	Panel exits Purge mode after approximately 2 seconds. Panel waits for next call for heat, cool or fan from zone thermostats. If no calls exist, panel remains in Idle mode.	Used to troubleshoot the system. Pressing the button cancels the Purge mode and makes troubleshooting the system quicker and easier.
PANEL RECEIVES SIMULTANEOUS CALLS FOR HEAT AND COOL FROM DIFFERENT ZONES				
None	Panel	None	Panel defaults to the last type of call (heat or cool) to determine which type of conditioning to choose.	When the first call for conditioning ends, the panel enters the Purge mode, then delivers conditioning to the other zone(s), as required.
WHILE ZONE 1 CALLS FOR HEAT, ZONE 2 CALLS FOR COOL				
None	Panel	None	Panel delivers heat into zone 1 until call is satisfied or for a 20- minute delay, whichever occurs first. Panel enters Purge mode. Panel delivers cool into zone 2 until call is satisfied, or for a 20-minute delay, whichever occurs first.	Prevents one zone from never receiving conditioning because it is requesting the opposite device.

SERVICE

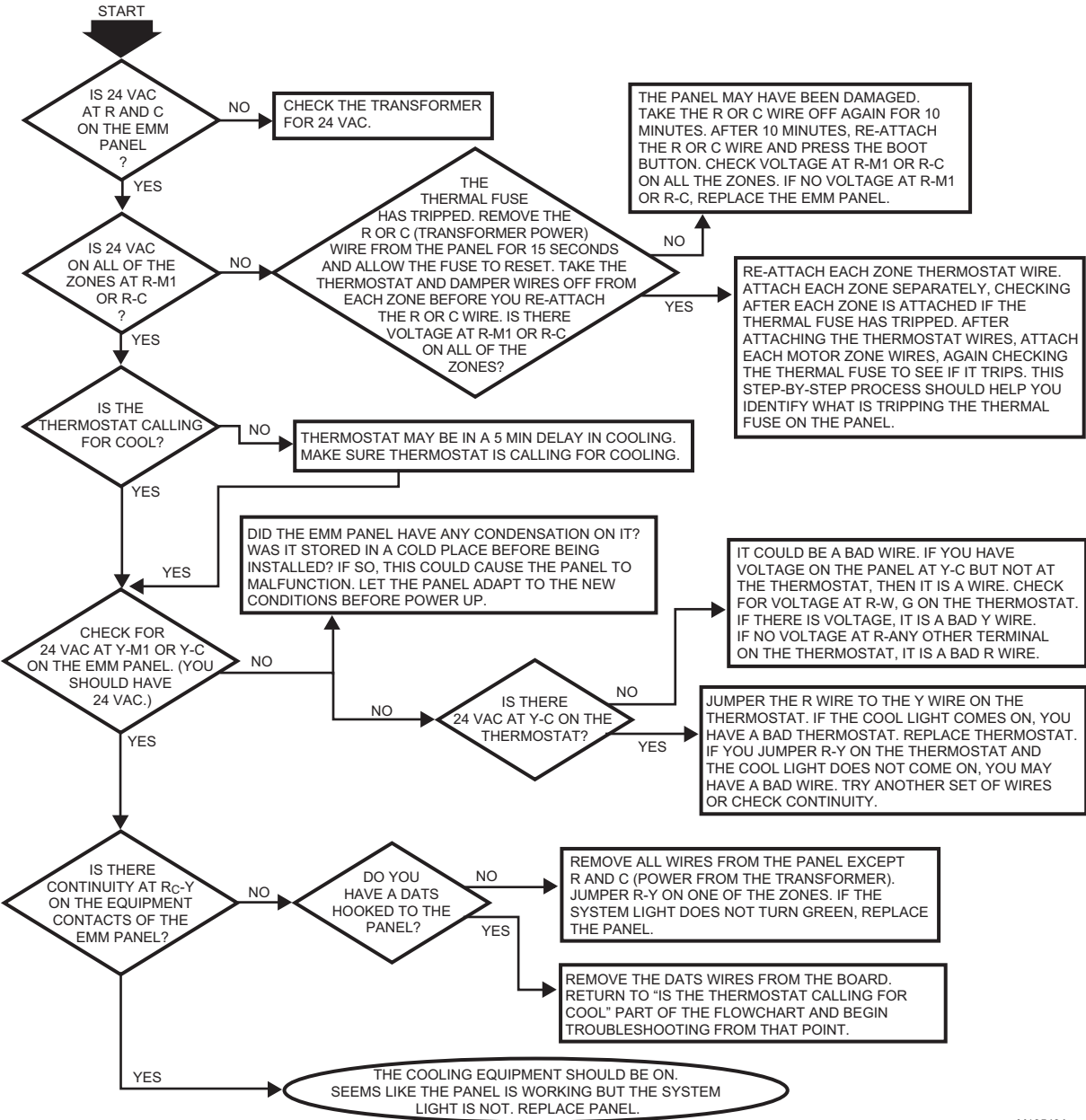
Purge timing— fixed at two and one-half minutes; not field-adjustable.

Fan operation in Purge mode—fan is on in Purge mode; not field adjustable.

DATS Operation—High limit is 160° F (71°C); low limit is 44°F (6°C) and not field-adjustable.

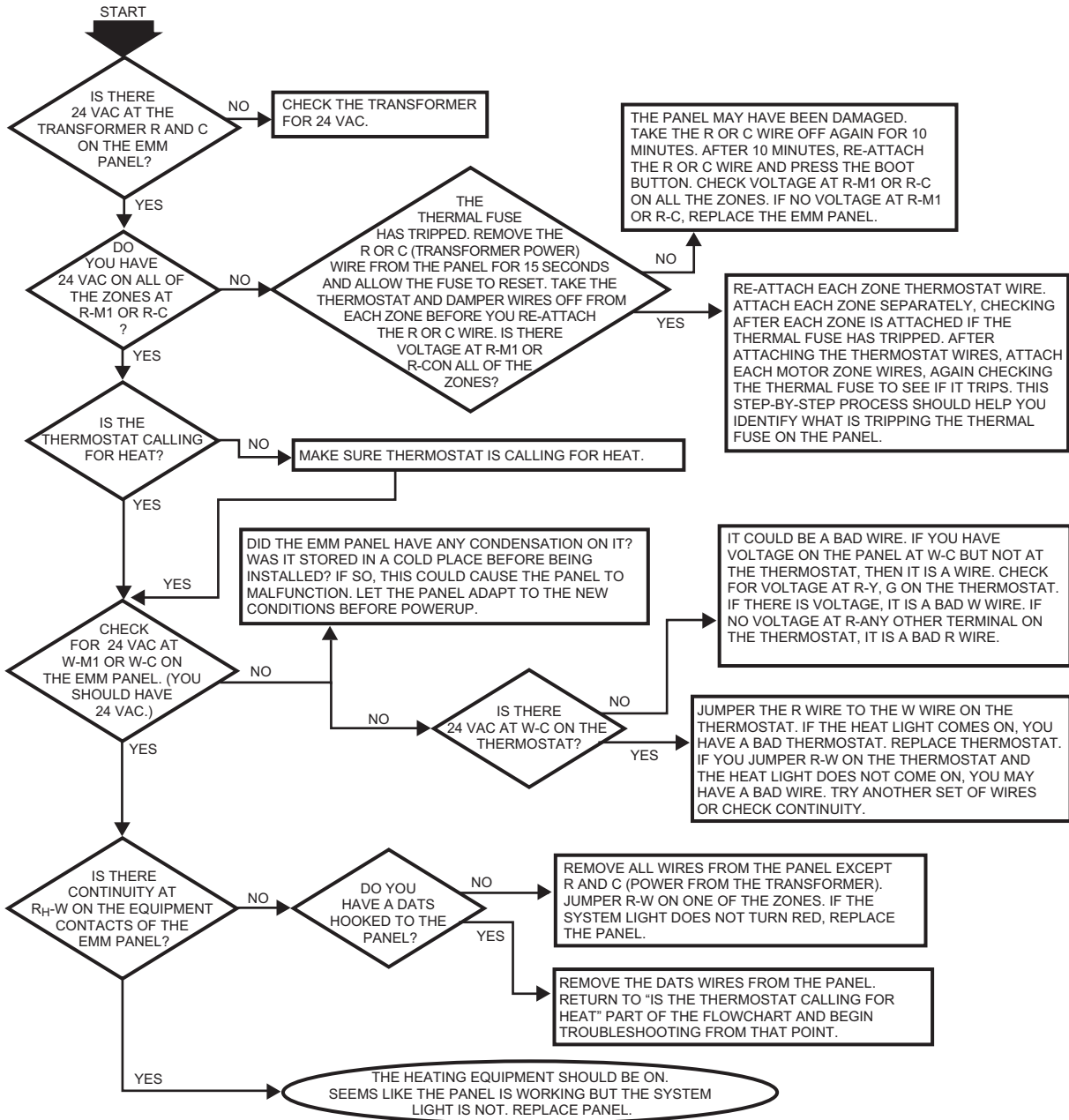
TROUBLESHOOTING

The primary diagnostic tools are the SYSTEM and ZONE damper status LED and the BOOT and PURGE OVERRIDE buttons. See Fig. 7 and 8 for troubleshooting flowcharts.



M13543A

Fig. 7. Thermostat is calling for cooling but the system light is not turning green to show a cool call.



M13546A

Fig. 8. Thermostat is calling for heating but the system light is not turning red to show a heat call.

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