



Safety & Installation Instructions

READ AND SAVE THESE INSTRUCTIONS

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INSTALLATION

INSTALLATION LOCATION RECOMMENDATIONS

Thermostat should be mounted:

- On an interior wall, in a frequently occupied space.
- Approximately 5' above floor.
- At least 18" from outside wall.
- Thermostat can be mounted to a vertical junction box.

Do not mount thermostat:

- Behind doors, in corners or other dead air spaces.
- In direct sunlight, near lighting fixtures, or other appliances that give off heat.
- On an outside or unconditioned area wall.
- In the flow of a supply register, in stairwells, or near outside doors.
- On a wall with concealed pipes or ductwork.

OUTDOOR TEMPERATURE SENSOR (OPTIONAL)

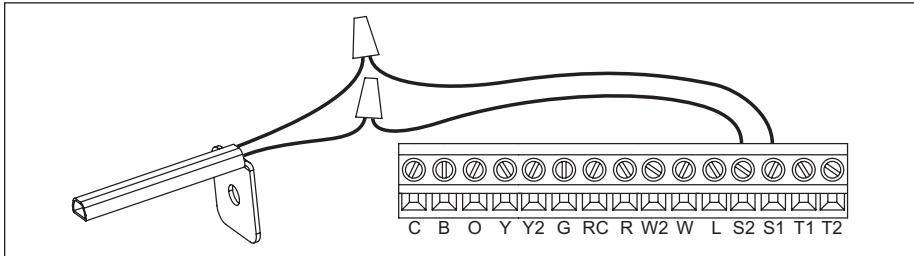
Outdoor temperature can be measured by attaching an 8052 sensor to the S1 and S2 terminals. The outdoor sensor must be enabled in the installer setup menu.

Heat pump models can use the outdoor temperature to effectively utilize the heat pump:

- When the outdoor temperature is less than the Low Balance Point, the heat pump will be locked out and only auxiliary heating will be used.
- When the outdoor temperature is higher than the High Balance Point, the auxiliary heating will be locked out and only the heat pump will be used to provide heating.

Outdoor temperature sensor should be mounted:

- On side of building out of direct sunlight (north side recommended).
- Above snow line.
- At least 3' away from exhaust vents and condensing lines.
- Using less than 300' of wire.
- Do not route wires along 120 VAC lines.



INSTALLATION

REMOTE TEMPERATURE SENSOR (OPTIONAL)

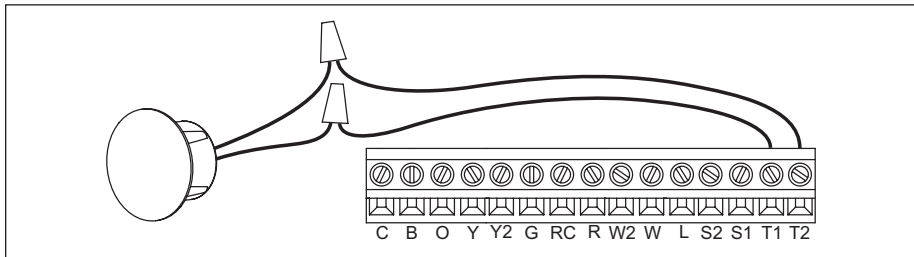
A remote temperature sensor can be used if the thermostat has to be mounted in a concealed location. A 8051 flush mount or 8053 surface mount remote temperature sensor can be attached to the T1 and T2 terminals and mounted in a recommended area. The remote sensor must be enabled in the installer setup menu. When the remote sensor is installed it overrides the internal sensor.

Remote temperature sensor should be mounted:

- On an interior wall, in a frequently occupied space.
- Approximately 5' above floor.
- At least 18" from outside wall.
- Using less than 300' of wire.

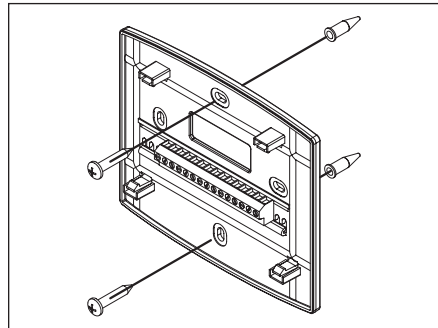
Do not mount remote sensor:

- Behind doors, in corners or other dead air spaces.
- In direct sunlight, near lighting fixtures, or other appliances that give off heat.
- On an outside or unconditioned area wall.
- In the flow of a supply register, in stairwells, or near outside doors.
- On a wall with concealed pipes or ductwork.
- Near 120 VAC lines.



THERMOSTAT MOUNTING

1. Remove the rear mounting plate from the thermostat.
2. Pull wires through the opening on the back of the thermostat.
3. Position and level the mounting plate of the thermostat on wall and mark the hole locations with a pencil.
4. Drill 1/4" holes and insert supplied anchors (drywall only).
5. Place mounting plate over anchors, insert and tighten screws.
6. Seal wire entry holes to prevent drafts affecting temperature readings.



POWER & RESET OPTIONS

The thermostat is dual power. It can either be AC or battery powered, or both (to provide backup power for the clock). Batteries are optional if your thermostat was wired to run on AC power when installed.

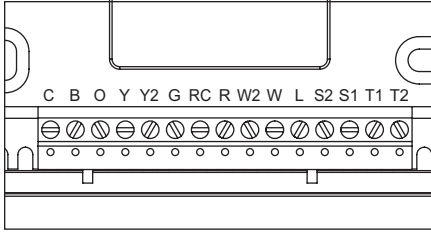
For heat pump systems the C terminal must be connected to the common of the 24VAC transformer in order for the system fault and emergency heat indicators to operate.

The thermostat has a memory backup that saves the thermostat settings in case of a power interruption. The system settings will be retained but the clock will reset after 90 seconds with no battery or AC power.

The reset button located under the battery cover can be used to reset the thermostat to factory defaults. The system settings will also be reset to default.

INSTALLATION

WIRING TERMINAL



Wire specifications:

18-24 gauge thermostat wire

Installation notes:

- Ensure power at the HVAC equipment is off.
- Loosen screw terminals, insert stripped wire and re-tighten.
- Push the excess wire back into the opening and plug the wall opening to prevent drafts.

C – Common (optional when powered by batteries)

B – Reversing valve¹

O – Reversing valve¹

Y – 1st stage cooling / compressor

Y2 – 2nd stage cooling / compressor

G – Fan

RC – 24VAC supply cooling²

R – 24VAC supply heating²

W2 – 2nd stage heat / auxiliary

W – 1st stage heat / auxiliary

L – System fault indicator (optional) (heat pump only)

S1 & S2 – outdoor temperature sensor (optional)

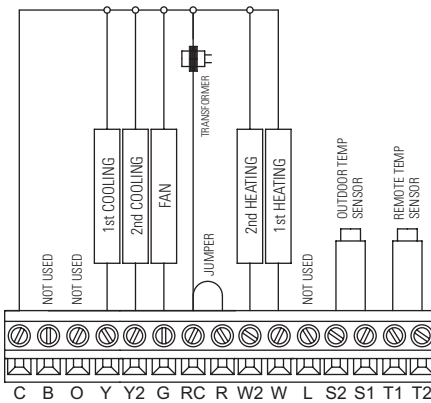
T1 & T2 – remote temperature sensor (optional)

¹ O and B terminals are both de-energized when system mode is OFF or in AUTO when the heating and cooling equipment is idle.

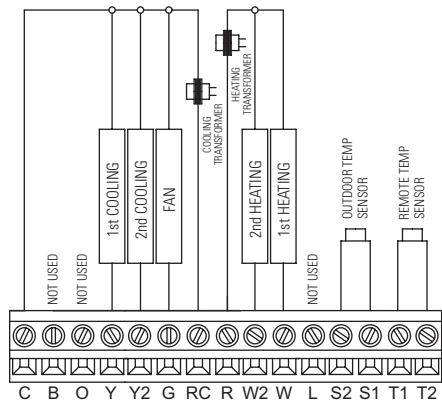
² Jumper between RC & R is used in single transformer systems (see wiring diagrams).

CONVENTIONAL HEAT/COOL

SINGLE TRANSFORMER (USE JUMPER WIRE)



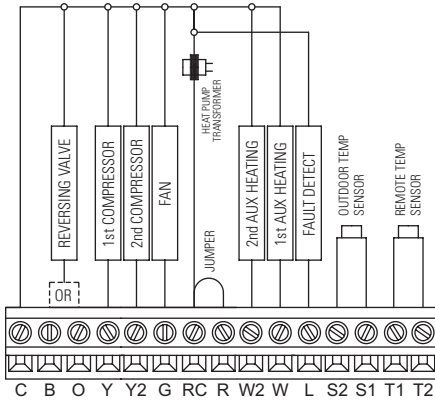
TWO TRANSFORMERS (REMOVE JUMPER WIRE)



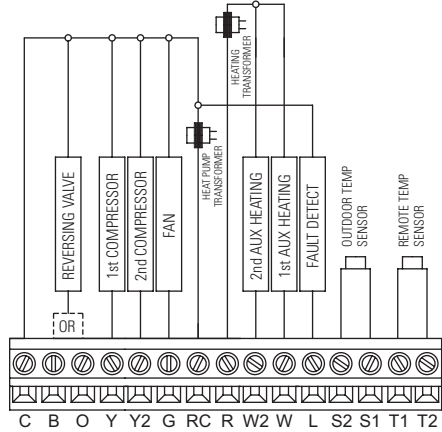
INSTALLATION

HEAT PUMP

SINGLE TRANSFORMER (USE JUMPER WIRE)



TWO TRANSFORMERS (REMOVE JUMPER WIRE)



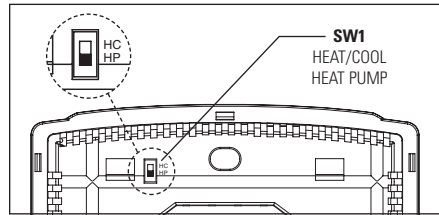
NOTE: "O" is active in cooling and "B" is active in heating.

SETUP & TESTING

EQUIPMENT TYPE SELECTION SWITCH (SW1)

This thermostat has the option of being used in heat pump or heat/cool systems. Switch SW1 located on the back of the thermostat's face is used to select this option. This setting can also be checked in the Installer System Settings under Equipment Type.

Note: Thermostat reboots within 10 seconds after switch position is changed.



INSTALLER SETUP MENU

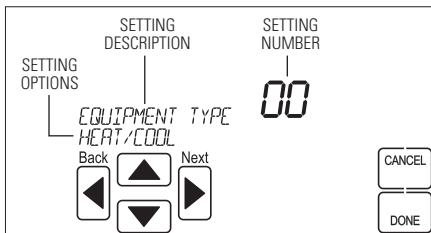
HOW TO ENTER THE INSTALLER SETUP MENU TO CHANGE SYSTEM SETTINGS:

Press **[MODE]** to set system to OFF.

Press **[MENU]** to enter main menu.

Press and hold **[SETUP]** for seven seconds, **[INSTALL SETUP]** appears.

Press **[INSTALL SETUP]** to enter installer setup menu.



Press **[NEXT]** or **[BACK]** to page through the settings.

Press **▲** or **▼** to adjust the setting.

Press **[DONE]** to save and exit, Or **[CANCEL]** to exit without saving.

The thermostat will discard changes and exit if nothing is pressed within 60 seconds.

To reset the installer settings to the default, reset the thermostat by pressing the **[RESET]** key.

SETUP & TESTING

INSTALLER SYSTEM SETTINGS TABLE

The following table is the list of the settings and their details. Default settings are shown in **bold**. Some settings are only available to thermostats set to heat pump mode.

System setting	Description	Factory default setting (bold) and setting range
00. Equipment type	Equipment type is set by SW1	Heat/Cool Heat Pump
01. Heat/Cool control setup	Used to lockout heating or cooling outputs (only available in Heat/Cool mode)	Heat and Cool Heat Only Cool Only
02. Equipment stages	Number of stages of equipment	Single Stage Multi Stage
03. Auxiliary heat stages	Number of stages of auxiliary heat equipment	1 Stage 2 Stages
04. Temperature scale	Set the thermostat to Fahrenheit or Celsius mode	Fahrenheit Celsius
05. Fan control in Heating/Aux heat selection	Determines if thermostat or equipment controls fan in heating. In heat pump applications, this is also auxiliary heat selection. ¹	Gas or oil heat (equipment controls fan) Electric heat (thermostat controls fan)
06. Extended fan – Heat	Extends fan operation after heat call ends	Disable Enable (90 second extension)
07. Extended fan – Cool	Extends fan operation after cool call ends	Disable Enable (90 second extension)
08. Internal sensor offset	Field adjustment of internal temperature sensor	0° : No offset applied –4°F to +4°F (–2°C to +2°C)
09. Auto changeover	Enable or disable Auto changeover mode	Disable Enable
10. Remote sensor	Select if remote sensor is attached or not	No Yes
11. Outdoor sensor	Select if outdoor sensor is attached or not	No Yes
12. Compressor minimum off time	Minimum off time for compressor protection	5 minutes 1 to 5 minutes
13. Heating minimum off time	Minimum off time for heating	2 minutes 1 to 5 minutes
14. Equipment minimum on time	Minimum on time for heating and cooling	2 minutes 1 to 5 minutes
15. Auto changeover time	Minimum time between heating and cooling calls	4 minutes 1 to 5 minutes
16. 1st stage differential	1st stage differential	1°F (0.5°C) 1°F to 4°F (0.5°C to 2°C)
17. 2nd stage differential	2nd stage differential	1°F (0.5°C) 1°F to 4°F (0.5°C to 2°C)
18. 3rd stage differential	3rd stage differential	1°F (0.5°C) 1°F to 4°F (0.5°C to 2°C)
19. 4th stage differential	4th stage differential	1°F (0.5°C) 1°F to 4°F (0.5°C to 2°C)
22. Screen lockout	Screen lockout level. (Override lockout by holding [MENU] for 7 seconds)	OFF : No lockout Partial lockout Full lockout

¹In heat pump mode, this system setting is also the auxiliary heat setting. If utilizing a fossil fuel auxiliary heat system, set to Gas or Oil Furnace. In this setting, the heat pump will lock out before the fossil fuel auxiliary heat comes on; eliminating the need for a dual fuel kit. If utilizing electric auxiliary heat, set to Electric. In this setting, the heat pump and electric auxiliary heat are allowed to run simultaneously.

SETUP & TESTING

INSTALLER SYSTEM SETTINGS TABLE (CONTINUED)

System setting	Description	Factory default setting (bold) and setting range
23. Partial lockout type	Select lockout type (only available when screen lockout is set to partial lockout)	Allow changes to Fan Mode, System Mode and Setpoints Allow changes to Fan Mode and Setpoints only Allow changes to Setpoints only
24. Max setpoint change in lockout	Select setpoint limits (only available when screen lockout is set to partial lockout)	±3° F or C (from current setpoint) ±1° to 20° OFF indicates no setpoint changes
25. Integral factor period (P+I control)	Short period = more cycles per hour (comfort) Long period = less cycles per hour (economical)	2 minutes 1 to 5 minutes or "OFF" for proportional control only
26. Deadband	Auto changeover mode dead band	3°F (2°C) 2°F to 9°F (1°C to 5°C)
27. Progressive recovery	Enable or disable Progressive recovery	Disable Enable
28. Low balance point	Outdoor temperature low balance point (This option is only displayed if the outdoor temperature sensor is enabled)	20°F (-6°C) 10°F to 50°F (-12°C to 9°C) or OFF to ignore
29. High balance point	Outdoor temperature high balance point (This option is only displayed if the outdoor temperature sensor is enabled)	65°F (18°C) 40°F to 65°F (3°C to 18°C) or OFF to ignore
30. Program format	Select weekly program format	7-day (Mon, Tue, Wed, Thu, Fri, Sat, Sun) 5/1/1 (weekdays, Saturday and Sunday) 5/2 (weekdays and weekends) non-programmable
31. Event configuration	Setting for event naming	Residential Commercial
32. Events per day	Number of program events per day.	Selects 4 events per day Selects 2 events per day
33. Change air filter alarm	The period for displaying the "Change Air Filter" message	OFF 1, 3, 6, 12 months or "OFF" to disable
34. Change water panel alarm	Set number of months until the first reminder is required. The following reminders will occur every 12 months for a flow through humidifier, and 3/9 months for a drainless humidifier	OFF 1 to 12 months or "OFF" to disable
35. Humidifier type	Select humidifier type. Flow through type gives a 12 month reminder, and drainless gives a 3/9 month reminder.	Flow through type humidifier (1 reminder per season) Drain-less type humidifier (2 reminders per season)
36. Service dehumidifier alarm	The period for displaying the "Service Dehumidifier" message	OFF 1 to 12 months or "OFF" to disable
37. Service HVAC alarm	The period for displaying the "Service HVAC" message	OFF 1 to 12 months or "OFF" to disable
38. Constant backlight	Enable constant, low intensity, backlight when 24VAC is present.	Disable Enable
39. Backlight intensity	Backlight intensity as a percentage of full on	100 0 – 100%
40. Daylight savings	Enable or disable auto daylight savings	OFF March (second Sunday in March to the first Sunday in November) April (first Sunday in April to the last Sunday in October)

SETUP & TESTING

SYSTEM TEST MENU

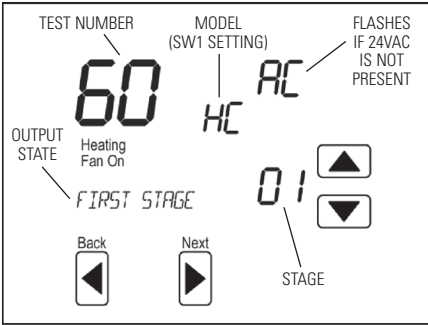
The system test menu is used to test a system after installation. The outputs of the thermostat can be manually activated to test their function. The instructions below show how to enter the test mode and turn outputs on and off.

HOW TO ENTER THE SYSTEM TEST MENU:

Press [MODE] to set system to off.

Press and hold [FAN] and [MODE] for three seconds to enter system test mode.

The screen of the first test step #60 is displayed:



The test number is displayed on the upper left, and the output state is displayed in the message center.

Press ▲ to turn on the output (01). For multi stage output, **press ▲** again to turn on the 2nd stage (02).

Press ▼ to turn off all the output (00).

Press [BACK] or [NEXT] to change to the next test step.

When the last step (63) is done, **press [NEXT]**. The message "installer test complete" will display.

All minimum on and off timers will be reset after returning from system test mode.

Note: Second stage will only be displayed when the thermostat is set to multi-stage mode.

Test Number	System test
60	Heating equipment test
61	Cooling equipment test
62	Auxiliary equipment test (HP only)
63	Fan equipment test

SETUP & TESTING

SYSTEM TEST TABLES

Test 60: Heating Equipment Test

Button Press	Equipment Type	Stages	Heat Type	W	W2	Y	Y2	G	O	B
1st UP press	Heat Cool	NA	Gas	ON						ON
			Electric	ON				ON		ON
	Heat Pump	NA	NA			ON		ON		ON
2nd UP press	Heat Cool	1	NA	ON						ON
		2	Gas	ON	ON					ON
	Electric		ON	ON				ON		ON
	Heat Pump	1	NA			ON		ON		ON
2		NA			ON	ON	ON		ON	

Test 61: Cooling Equipment Test

Button Press	Equipment Type	Stages		W	W2	Y	Y2	G	O	B
1st UP press	Heat Cool	NA				ON		ON	ON	
	Heat Pump	NA				ON		ON	ON	
2nd UP press	Heat Cool	1				ON		ON	ON	
		2				ON	ON	ON	ON	
	Heat Pump	1					ON		ON	ON
		2					ON	ON	ON	ON

Test 62: Auxiliary Equipment Test (HP only)

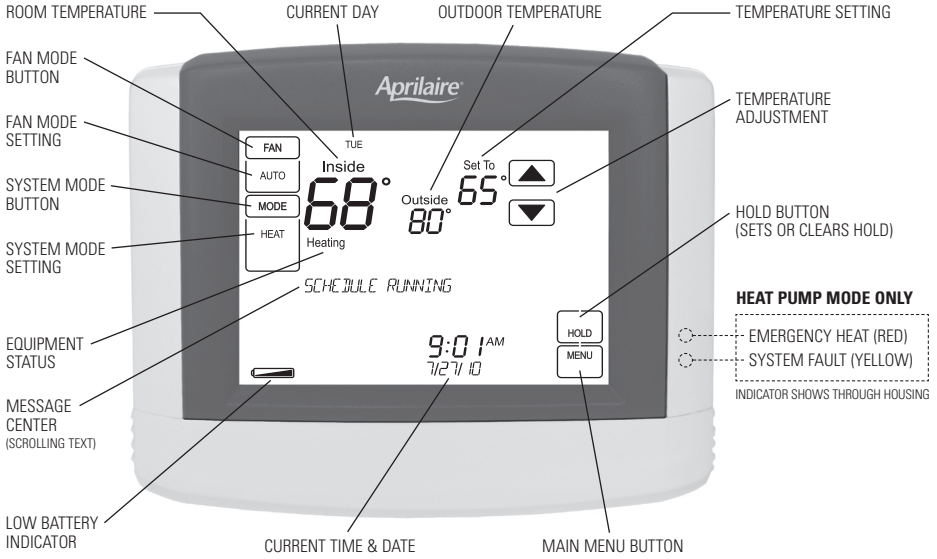
Button Press	Equipment Type	Heat Type		W	W2	Y	Y2	G	O	B
1st UP press	Heat Pump	Gas		ON						ON
		Electric		ON				ON		ON
2nd UP press	Heat Pump	Gas		ON	ON					ON
		Electric		ON	ON			ON		ON

Test 63: Fan Equipment Test

Button Press		W	W2	Y	Y2	G	O	B
1st UP press						ON		

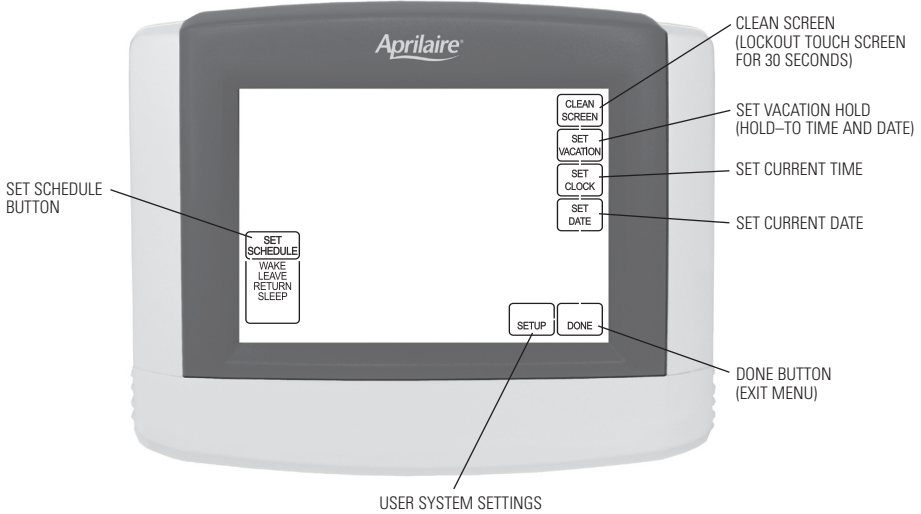
QUICK REFERENCE TO CONTROLS & DISPLAY

HOME SCREEN



NOTE: BACKLIGHT IS ACTIVATED WITH FIRST BUTTON PRESS AND AUTOMATICALLY TURNS OFF.

MAIN MENU



TROUBLESHOOTING

DISPLAY IS BLANK

- Check circuit breaker and reset if necessary.
- Make sure power switch at heating & cooling system is on.
- Make sure furnace door is closed securely.
- If thermostat is battery powered, make sure fresh AA alkaline batteries are correctly installed.

TEMPERATURE SETTINGS DO NOT CHANGE

Make sure heating and cooling temperatures are set to acceptable ranges:

- Heat: 40° to 90°F (4° to 32°C).
- Cool: 50° to 99°F (10° to 37°C).

HEATING SYSTEM DOES NOT RESPOND ("HEATING" APPEARS ON SCREEN)

- Check for 24VAC at the equipment on the secondary side of the transformer between power and common. If voltage is not present, check the heating equipment to find the cause of the problem.
- Check for 24VAC between the heat terminal (W) and the transformer common. If 24VAC is present, the thermostat is functional. Check the heating equipment to find the cause of the problem.
- Check for loose or broken wires between the thermostat and the heating equipment.

COOLING SYSTEM DOES NOT RESPOND ("COOLING" APPEARS ON SCREEN)

- Check for 24VAC at the equipment on the secondary side of the transformer between power and common. If voltage is not present, check the cooling equipment to find the cause of the problem.
- Check for 24VAC between the cooling terminal (Y) and the transformer common. If 24VAC is present, the thermostat is functional. Check the cooling system to find the cause of the problem.
- Check for loose or broken wires between the thermostat and the cooling equipment.

FAN DOES NOT TURN ON IN A CALL FOR HEAT

- Check System Setting 05 (Fan Control), to make sure the fan control is properly set to match the type of system (see page 6).

HEAT PUMP ISSUES COOL AIR IN HEAT MODE, OR WARM AIR IN COOL MODE

- Check wiring at the terminal block to confirm the reversing valve is connected to the proper terminal. O is active in cooling and B is active in heating.

HEAT/COOL BOTH ON AT SAME TIME

- Check SW1 (Equipment Type), to make sure it is set to match the installed heating/cooling equipment (see page 5).
- Check to make sure heating and cooling wires are not shorted together.

HEATING EQUIPMENT IS RUNNING IN COOL MODE

- Check SW1 (Equipment Type), to make sure it is set to match the installed heating/cooling equipment (see page 5).

"HEATING" IS NOT DISPLAYED

- Check Installer System Setting number 01 (Control Setup) is set correctly.
- Change the System Mode to Heat, and set the temperature level above the current room temperature.

"COOLING" IS NOT DISPLAYED

- Check Installer System Setting number 01 (Control Setup) is set correctly.
- Change the System Mode to Cool, and set the temperature level below the current room temperature.

ERROR CODES

If the thermostat enters an error mode, all outputs are turned off. The thermostat attempts to recover every 10 minutes. If the error does not clear, use the reset button. This will return all settings back to factory default.

Error code	Message	Error Description
01	"SENSOR ERROR"	Open temperature sensor circuit
02		Shorted temperature sensor circuit
04	"EEPROM ERROR"	Error in permanent memory

THERMOSTAT FEATURES

- Large touch screen with adjustable backlight – constant backlight option available with 24VAC.
- Message center provides feedback and instructions.
- 7 day programmability or separately programmable weekday/weekend schedules.
- Thermostat can be removed from the wall for easy programming (batteries must be installed).
- Front battery door access for fast, easy replacement.
- Displays room temperature, temperature setting, and optional outdoor temperature.
- Air filter, humidifier, dehumidifier, and HVAC service indicators.
- Programmable fan control with fan circulation mode.
- Easy to use temperature control can override program schedule at any time.
- Progressive recovery ensures proper temperature at the start of a program event.
- Built in compressor protection prevents damage to your equipment.
- Dual power option (battery or 24VAC).
- System test mode.

SPECIFICATIONS

Environment	
Temperature	Operating: 32° to 120°F (0° to 48.9°C) Shipping: -30° to 150°F (-34.4° to 65.5°C)
Relative humidity	Operating: 5% to 90% R.H. (non-condensing)

Electrical	
Operating voltage	24VAC (18 – 30VAC)
Current	Maximum: 2.5A (total), 1.0A (single output) Maximum surge current: 5A
Power supply	Dual power. Can be battery or 24VAC powered. When both the sources are available, battery will be used as back up power.
Battery power	Battery power: AA size alkaline battery x 2 Battery life: Approximately 1 year

Thermal	
Outdoor & Remote temperature sensor	Maximum distance: 300 feet
Room temperature measurement	Display range: 32° to 99°F (0° to 40°C)
Outdoor temperature measurement	Display range: -20° to 130°F (-30° to 55°C)
Setpoint temperature range	Heat: 40° to 90°F (4° to 32°C) Cool: 50° to 99°F (10° to 37°C)



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