



Model CH-TSB10-WF Wi-Fi Automation Thermostat with Event Based™ Air Cleaning



Safety & Installation Instructions

READ AND SAVE THESE INSTRUCTIONS

TABLE OF CONTENTS

WI-FI SETUP

Wi-Fi setup.....	3
------------------	---

INSTALLATION

Installation location recommendations.....	5
Outdoor temperature sensor (optional).....	6
Thermostat mounting.....	7
Power & reset options.....	7
Wiring terminal.....	8
Wiring diagrams.....	9

SETUP & TESTING

System setup instructions.....	11
System test mode.....	18

REFERENCES

Quick reference to controls & display.....	22
Thermostat features.....	23
Troubleshooting.....	24
Specifications.....	26

WI-FI SETUP

To connect the CH-TSB10-WF thermostat to a Wi-Fi network follow the steps below.

Note: You will need a computer or mobile device with Wi-Fi and a web browser.

STEP 1

Verify the thermostat is in Wi-Fi Connection Mode.

The thermostat by default will be in Wi-Fi Connection Mode. To confirm that the thermostat is in Wi-Fi Connection Mode, verify that the radio bars on the thermostat are strobing as shown below.



Note: If the thermostat is not in Wi-Fi Connection Mode, refer to the Owner's manual for instructions on clearing the Wi-Fi settings.

STEP 2

Connect to the thermostat using a computer or mobile device.

On your computer or mobile device, scan for available networks. The thermostat should appear as CLAREHVAC followed by a unique identifier, corresponding to the last 4 digits of the MAC address. Connect to the thermostat you want to configure.

If you are installing multiple thermostats, you can determine the MAC address of the specific thermostat you are trying to configure by removing the cover on the front of the thermostat to access the MAC address label.

(Continued on the following page.)

WI-FI SETUP

STEP 3

Configure the thermostat to connect to the Wi-Fi network.

Open a web browser on your computer or mobile device. In the browser enter:

<http://192.168.1.99/clare.html>

In the web browser interface select the network you want to connect the thermostat to, and enter the network's security credentials.

STEP 4

Verify the thermostat is connected to the Wi-Fi network.

Once all the required information is entered in the web browser interface, the thermostat will connect to the Wi-Fi network you selected. After the thermostat is connected to the Wi-Fi network, the thermostat will display the radio bars based on the Wi-Fi signal strength. If the radio bars are not displaying the signal strength, refer to Wi-Fi Maintenance and Troubleshooting in the Owner's manual.

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.

INSTALLATION

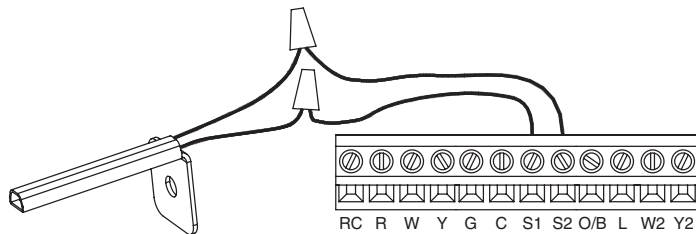
OUTDOOR TEMPERATURE SENSOR (OPTIONAL)

Outdoor temperature can be measured by attaching an 8052 sensor to the S1 and S2 terminals. System setting #15 (Outdoor Sensor) is used to enable sensor.

Heat pump applications 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 to provide heating.
- 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.

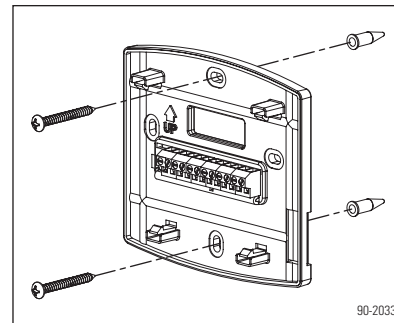
- Install on side of building out of direct sunlight (north side recommended).
- Mount above snow line.
- Mount at least 3' away from exhaust vents and condensing lines.
- Maximum wire length is 300'.
- Do not route wires along 120 VAC lines.



INSTALLATION

THERMOSTAT MOUNTING

1. Remove the rear mounting plate from the thermostat.
2. Pull wires through the opening on the back of the rear mounting plate.
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 powered from 24VAC. In the case of power loss the thermostat will maintain the clock for 24 hours. The thermostat has a memory backup that saves the thermostat settings in case of power interruption.

The reset button located under the cover on the front of the thermostat can be used to reset the thermostat to factory defaults. The system settings will also be set 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.

RC – 24 VAC supply cooling*

R – 24 VAC supply heating*

W – First stage heat (conventional) / First stage auxiliary (heat pump)

Y – First stage cooling (conventional) / First stage compressor (heat pump)

G – Fan

C – Common

S1 & S2 – Outdoor temperature sensor (optional)

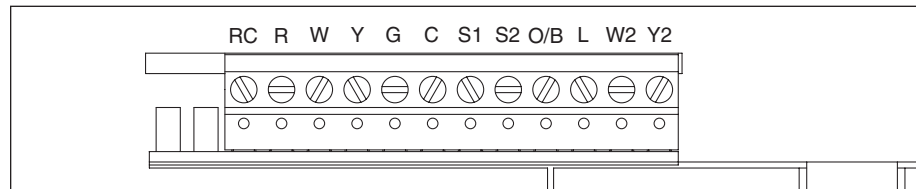
O/B – Reversing valve

L – System fault indicator

W2 – Second stage heat (conventional) / Second stage auxiliary (heat pump)

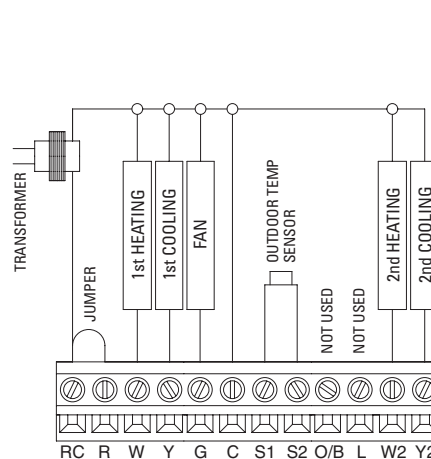
Y2 – Second stage cooling (conventional) / Second stage compressor (heat pump)

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

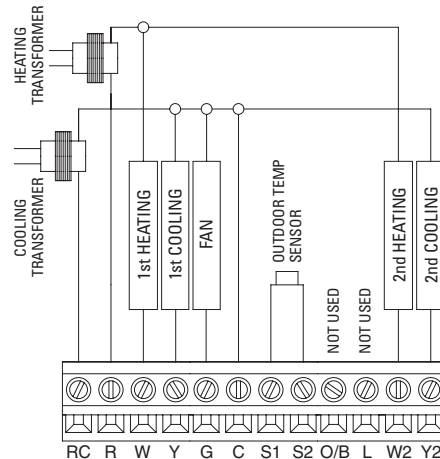


INSTALLATION

WIRING – SINGLE TRANSFORMER (USE JUMPER WIRE) FOR HEAT/COOL SYSTEM

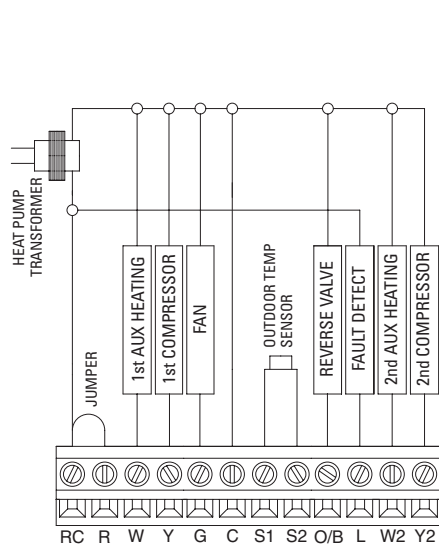


WIRING – TWO TRANSFORMERS (REMOVE JUMPER WIRE) FOR HEAT/COOL SYSTEM

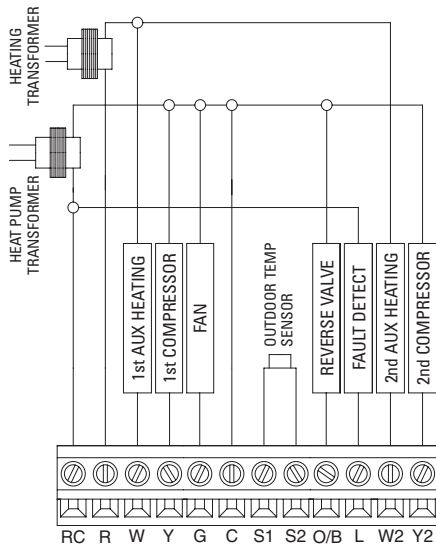


INSTALLATION

WIRING – SINGLE TRANSFORMER (USE JUMPER WIRE) FOR HEAT PUMP SYSTEM



WIRING – TWO TRANSFORMERS (REMOVE JUMPER WIRE) FOR HEAT PUMP SYSTEM



SETUP & TESTING

SYSTEM SETUP INSTRUCTIONS

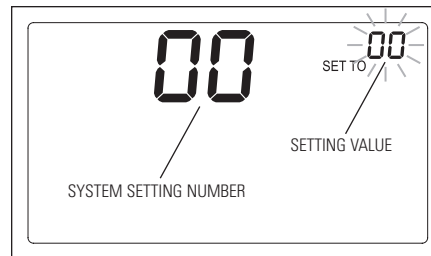
The following instructions show how to enter the system setup menu and change settings. The table on the following pages lists the settings and their details. Default settings are shown in **bold**. Some settings are only available based on other setting values.

How to enter the system setup menu to change system settings

Press **MODE** repeatedly until system is set to OFF.

Press and hold **▲** and **MODE** for three seconds.

The screen of the first setting will be displayed.



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

Press **MODE** to change to the next option.

Press **MODE** after the last setting. "DONE" will be displayed.

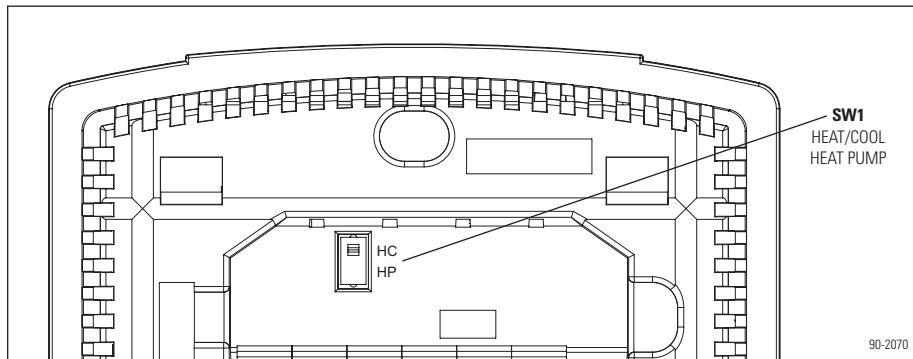
The thermostat will return to Normal mode if no button is pressed in 3 seconds.

To reset all system settings back to default, press the **RESET** button located under the cover on the front of the thermostat.

SETUP & TESTING

SYSTEM SETUP INSTRUCTIONS (CONTINUED)

The Model CH-TSB10-WF thermostat has the option of being used in heat pump or heat/cool systems. Switch SW1 located on the back of the thermostat is used to select this. System setting number 01 will only be shown on these models to display the position of SW1.



SETUP & TESTING

SYSTEM SETUP INSTRUCTIONS (CONTINUED)

System setting	Description	Factory default setting (bold) and setting range
01. Equipment Type	Equipment type set by SW1.	0: Heat/Cool 1: Heat Pump
02. Temperature Scale	Set the thermostat to Fahrenheit or Celsius mode.	0: Fahrenheit 1: Celsius
03. Reversing Valve	Selects O or B operation.	0: O – On in cooling 1: B – On in heating
04. Control Setup	Used to lockout heating or cooling outputs. Note: Only available if Equipment Type is set to Heat/Cool.	0: Heat and Cool 1: Heat Only 2: Cool Only
05. Heat/Cool: Cooling Stages Heat Pump: Compressor Stages	Heat/Cool: Number of Cooling Stages. Heat Pump: Number of Compressor Stages.	0: One 1: Two
06. Heat/Cool: Heating Stages Heat Pump: Aux Heat Stages	Heat/Cool: Number of Heat Stages. Heat Pump: Number of Auxiliary Heat Stages.	0: One 1: Two
07. Heat/Cool: Fan Control in Heating Heat Pump: Auxiliary Equipment Type	Heat/Cool: Determines if the thermostat or equipment controls the fan in heating. Heat Pump: Auxiliary Equipment type.	0: Gas/Oil Heat (equipment controls fan) 1: Electric Heat (thermostat controls fan)

SETUP & TESTING

SYSTEM SETUP INSTRUCTIONS (CONTINUED)

System setting	Description	Factory default setting (bold) and setting range
10. Temperature Sensor Offset	Field adjustment of temperature sensor.	0° (no offset applied) -4°F to +4°F (-2°C to +2°C)
12. Auto Changeover	Enable or disable auto changeover mode.	0: Disable 1: Enable
13. Deadband	Auto Changeover mode deadband.	3°F (1.5°C) 2°F to 9°F (1°C to 4.5°C)
15. Outdoor Sensor	Selects if an outdoor temperature sensor is not installed, a wired sensor is installed, or the outdoor temperature is provided by the automation system.	0: Not installed 1: Installed 2: Automation
18. Compressor Min Off Time	Minimum off time for compressor protection.	5 minutes 1 to 5 minutes
19. Heating Min Off Time	Minimum off time for heating.	2 minutes 1 to 5 minutes
20. Equipment Min On Time	Minimum on time for heating and cooling.	2 minutes 1 to 5 minutes
22. First Stage Differential	First stage differential.	1°F (0.5°C) 1°F to 9°F (0.5°C to 4.5°C)

SETUP & TESTING

SYSTEM SETUP INSTRUCTIONS (CONTINUED)

System setting	Description	Factory default setting (bold) and setting range
23. Second Stage Differential	Second stage differential.	1°F (0.5°C) 1°F to 9°F (0.5°C to 4.5°C)
24. Third Stage Differential	Third stage differential.	1°F (0.5°C) 1°F to 9°F (0.5°C to 4.5°C)
25. Fourth Stage Differential	Fourth stage differential.	1°F (0.5°C) 1°F to 9°F (0.5°C to 4.5°C)
26. Away	Enables the Away feature. The Away feature allows the automation system to use a single button press to set the thermostat to a predefined setpoint(s). The thermostat will hold the setpoint(s) until Away is canceled with the automation system or at the thermostat.	0: Disable 1: Enable
27. Heat Blast	Enables the Heat Blast® feature. The Heat Blast feature is only available with the automation system, and will raise the current room temperature 3°F to 5°F based on the Blast Offset and then resume normal operation. Heat Blast can be canceled with the automation system or at the thermostat.	0: Disable 1: Enable

SETUP & TESTING

SYSTEM SETUP INSTRUCTIONS (CONTINUED)

System setting	Description	Factory default setting (bold) and setting range
28. Blast Offset	Amount of heating when Heat Blast is initiated.	3°F (1.5°C) 3°F to 5°F (1.5°C to 2.5°C)
37. Stage Rate	Accumulation of equipment run time in equipment staging determination. 1 = more rapid staging of equipment (comfort). 5 = slower staging of equipment (economy).	2 1 to 5 or "OFF" to ignore accumulated run time.
38. Progressive Recovery	Enable or disable progressive recovery.	0: Disable 1: Enable
39. Low Balance Point	Outdoor temperature low balance point. Note: This option is only available if the outdoor sensor is set to Installed or Automation.	20°F or -8°C 0°F to 60°F (-18°C to 12°C) or OFF to ignore LBP
40. High Balance Point	Outdoor temperature high balance point. Note: This option is only available if the outdoor sensor is set to Installed or Automation.	65°F or 14.5°C 0°F to 80°F (-18°C to 22°C) or OFF to ignore HBP
41. Program Format	Enables the 7 day program.	0: 7-Day 1: Non-Prog
54. Change Air Filter Reminder	The period displaying the Change Air Filter reminder.	OFF 1 to 12 months

SETUP & TESTING

SYSTEM SETUP INSTRUCTIONS (CONTINUED)

System setting	Description	Factory default setting (bold) and setting range
55. Change Water Panel Reminder	The time until the first Change Water Pnl message is displayed.	OFF 1 to 12 months
56. Humidifier Type	Selects the type of humidifier. If humidifier type is set to Drain-less, then the first reminder is based on the system setting 55, the second reminder will activate 3 months later. If humidifier type is set to Flow through, then the first reminder is based on system setting 55, the second reminder will activate 12 months later.	0: Flow through type humidifier (1 reminder per season) 1: Drain-less type humidifier (2 reminders per season)

SETUP & TESTING

SYSTEM TEST MODE

The system test mode is used to test a system after installation. The outputs of the thermostat can be manually activated one at a time to test their function. The following instructions show how to enter the test mode and turn outputs on and off. The charts on the following pages show the output status for each test step for Heat/Cool and Heat Pump mode.

The test steps are:

Test Number	Heat/Cool	Heat Pump
50	Heating (W) (W2)	Compressor Heating (Y) (Y2)
51		Aux Heating (W) (W2)
52	Cooling (Y) (Y2)	Compressor Cooling (Y) (Y2)
53	Fan (G)	Fan (G)

SETUP & TESTING

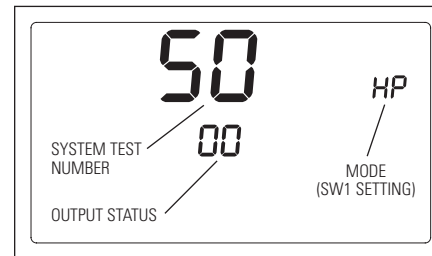
SYSTEM TEST MODE (CONTINUED)

How to enter the system test menu

Press **(MODE)** repeatedly until system is set to OFF.

Press and hold **(▲)** and **(CLEAN AIR)** for three seconds.

The screen of the first test step #50 is displayed:



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

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

Press **(MODE)** to change to the next test step.

Press **(MODE)** after the last test step. "DONE" will be displayed.

The thermostat will return to Normal mode if no button is pressed in 3 seconds.

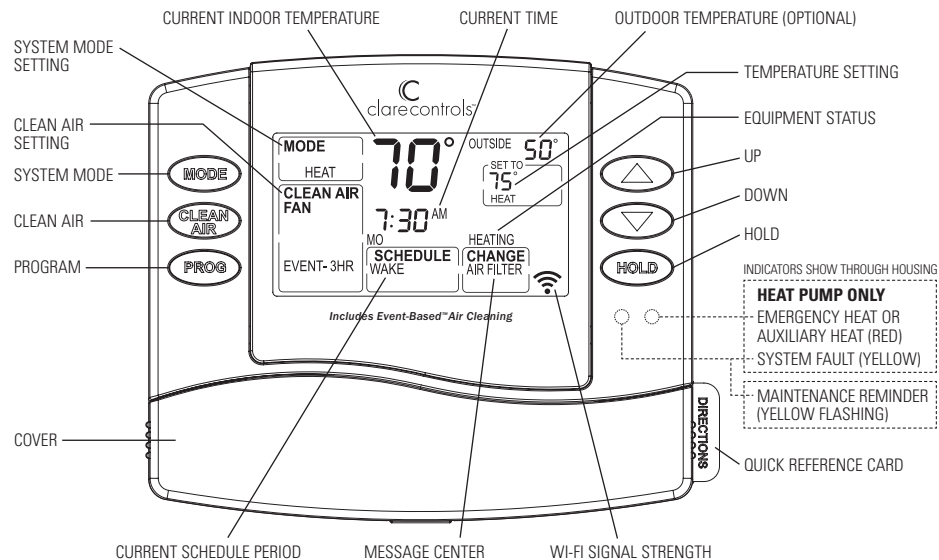
SETUP & TESTING

Test steps for Heat/Cool									
Step	Key Input	System Setting		Display (Output)					
		#07		01 HEATING ON (W)	02 HEATING ON (W2)	01 COOLING ON (Y)	02 COOLING ON (Y2)	01 FAN ON (G)	
#50 Heat	1st [UP]	0 : Gas		ON					
		1 : Elec		ON				ON	
	2nd [UP]	0 : Gas		ON	ON				
		1 : Elec		ON	ON			ON	
	[DOWN]								
#52 Cool	1st [UP]					ON		ON	
	2nd [UP]					ON	ON	ON	
	[DOWN]								
#53 Fan	[UP]							ON	
	[DOWN]								

SETUP & TESTING

Test steps for Heat Pump									
Step	Key Input	System Setting		Display (Output)					
		#07	#03	01 AUX HEATING ON (W)	02 AUX HEATING ON (W2)	01 COOL/HEAT ON (Y)	02 COOL/HEAT ON (Y2)	01 FAN ON (G)	O/B
#50 Heat	1st [UP]		0 : 0			ON		ON	
			1 : B			ON		ON	ON
	2nd [UP]		0 : 0			ON	ON	ON	
			1 : B			ON	ON	ON	ON
	[DOWN]		0 : 0						
			1 : B						ON
#51 Aux	1st [UP]	0 : Gas		ON					
		1 : Elec		ON				ON	
	2nd [UP]	0 : Gas		ON	ON				
		1 : Elec		ON	ON			ON	
	[DOWN]								
#52 Cool	1st [UP]		0 : 0			ON		ON	ON
			1 : B			ON		ON	
	2nd [UP]		0 : 0			ON	ON	ON	ON
			1 : B			ON	ON	ON	
	[DOWN]		0 : 0						ON
			1 : B						
#53 Fan	[UP]							ON	
	[DOWN]								

QUICK REFERENCE TO CONTROLS & DISPLAY



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

THERMOSTAT FEATURES

- Remote access and control over Wi-Fi.
- Event-Based™ Air Cleaning.
- Large, clear, backlit display is easy to read – even in the dark.
- Displays room temperature, temperature setting, and optional outdoor temperature.
- Built in compressor protection.
- Water panel and air filter service indicators.
- System test mode.
- 7 day programmability.
- Easy to use temperature control can override program schedule at any time.
- Progressive recovery. Progressive Recovery feature allows the thermostat to activate the heating and cooling equipment prior to an event in order to reach the desired temperature at the start of the next scheduled event.

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.

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 24 VAC 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 24 VAC between the heat terminal (W) and the transformer common. If 24 VAC 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.

TROUBLESHOOTING

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

- Check for 24 VAC 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 24 VAC between the cooling terminal (Y) and the transformer common. If 24 VAC 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 #07 (Fan Control), to make sure the fan control is properly set to match the type of system (see page 14).

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

- Check System Setting #03 (Reversing Valve), to make sure it is properly configured for your system (see page 13).

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 12).
- 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 12).

"HEATING" IS NOT DISPLAYED

- Change the System Mode to Heat, and set the temperature level above the current room temperature.

"COOLING" IS NOT DISPLAYED

- Change the System Mode to Cool, and set the temperature level below the current room temperature.

SPECIFICATIONS

Environment	
Temperature	Operating: 32° to 120°F (0° to 48.9°C) Shipping: -30° to 140°F (-34.4° to 60°C)
Relative humidity	Operating: 5% to 90% R.H. (non-condensing)

Electrical	
Operating voltage	24 VAC (18 – 30 VAC)
Current	Maximum: 2.5A (total), 1.0A (single output) Maximum surge current: 5A

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



7519 Pennsylvania Ave, Sarasota FL, 34243 • Phone: 941-328-3991

www.clarecontrols.com