

Installation Instructions
Please Read Before Installing

HVAC Controller: RR-HVAC-1
24 V~ 250 mA
Typical Power Consumption*: 3.2 W

Important Notes

Environment

HVAC Controller:

Ambient operating temperature: 32 °F to 160 °F (0 °C to 71 °C), 0% to 90% humidity, non-condensing. Indoor use only.

Codes

Install in accordance with all local and national electrical codes.

Cleaning

To clean, wipe with a clean damp cloth. DO NOT use any chemical cleaning solutions.

RF Device Placement

The Receiver must be within 30 ft (9 m) of an RF signal repeater.

Installation of an HVAC Controller

HVAC Controller should be installed by a climate control specialist.

- Find a suitable location for the HVAC Controller near an HVAC system and within 30 ft (9 m) of a repeater.
- Mount vertically or horizontally, as shown in the **Mounting Diagram**, using two #6 (M3) screws (included). When mounting, allow 7 in (177.8 mm) clearance for the antenna and ensure convenient access to the contact closures and front buttons. In order to achieve proper RF performance, do not mount unit in a metal enclosure.

Programming

After installation, the HVAC controller (LR-HVAC) will only function when programmed to a system with a seeTemp™ Wall Display (LRD-WST). For full functionality, the HVAC Controller must be programmed to a RadioRA® 2 Main Repeater (RR-MAIN-REP) and PC software must be used by a Lutron factory-trained installer. For questions on how to become a qualified installer, please contact your local Lutron representative.

Temporary Programming

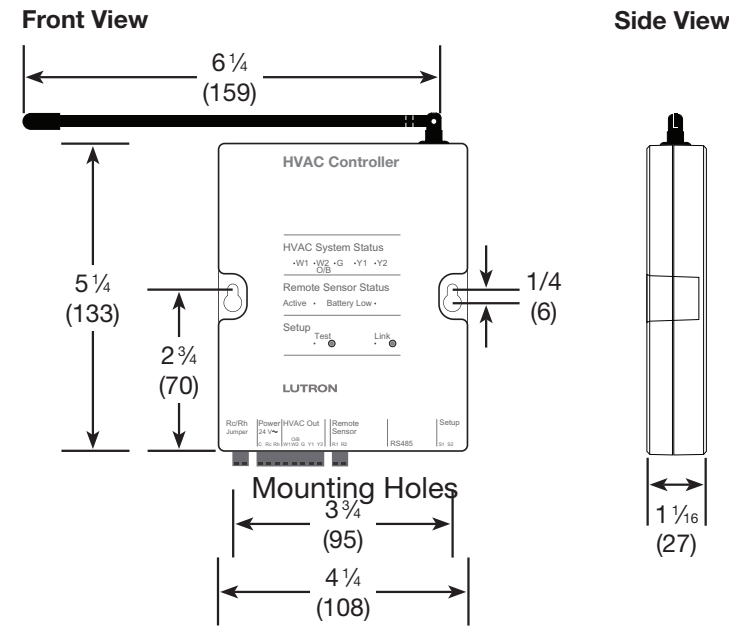
Since the HVAC system may need to function before a Lutron factory-trained installer is available for programming, temporary programming may be used to provide climate control.

To complete the steps below, the following are required: *RadioRA 2* Main Repeater (RR-MAIN-REP) within 30 ft of the HVAC controller, *seeTemp* unit(s), and Wireless Temperature sensor(s).

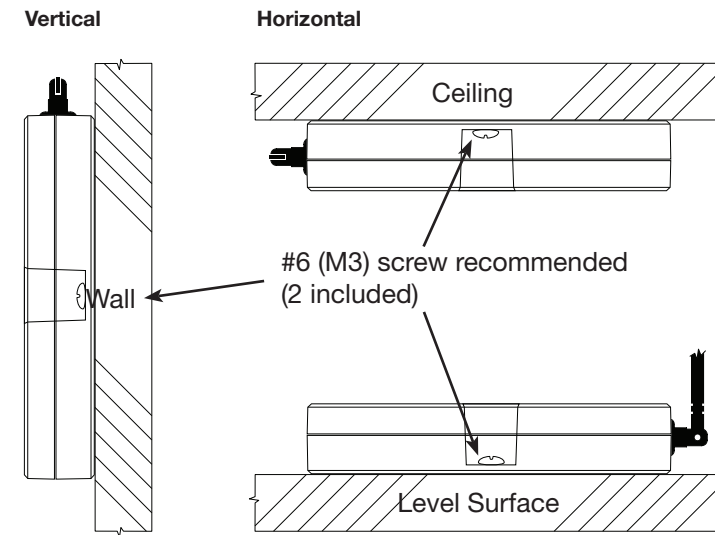
- Enter Add Mode:** Press and hold the "Add" button on Main Repeater for 3 seconds until green "Add" LED begins to rapid-flash (ten times per second) and repeater beeps. Wait 10 seconds.
- Add the devices to the Main Repeater:**
 - For the HVAC controller, press and hold the **Link** button for 3 seconds until all LEDs normal-flash (once per second).
 - For the *seeTemp*, press and hold the **Eco** button for 3 seconds until all LEDs normal-flash (once per second).
 - For the Wireless Temperature Sensor, press and hold the **Link** button for 6 seconds until the hidden LED flashes (once per second).
- Exit Add Mode:** Press and hold the "Add" button on any Repeater for 3 seconds until "Add" LED begins to rapid-flash. After LED turns off (can take up to 30-60 seconds), system has exited Add Mode.
- Test the system:**
 - Set the *seeTemp* to Heat or Cool mode.
 - Tap the link button on the Wireless Temperature Sensor. The Temperature will update on the *seeTemp*.
 - As the temperature changes, the HVAC controller will control the HVAC equipment when required.

* Typical Power Consumption test conditions: two LEDs on.

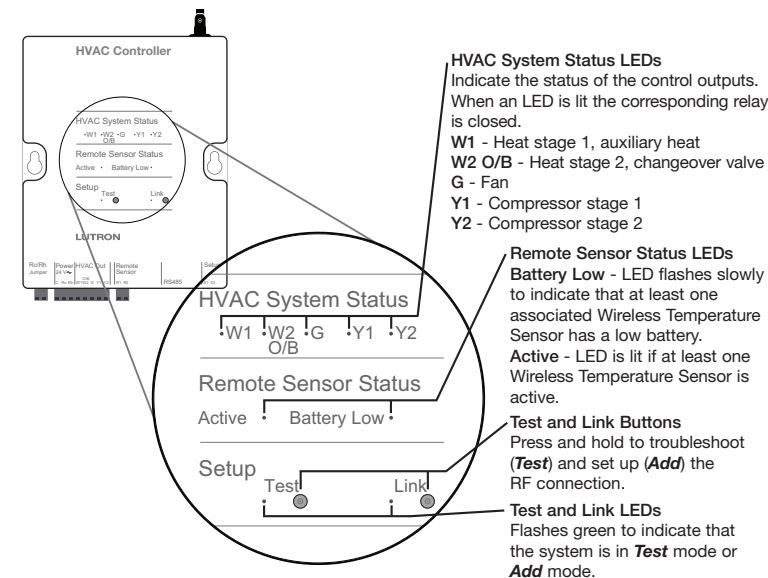
Dimensions Measurements shown in inches (mm).



Mounting Diagram



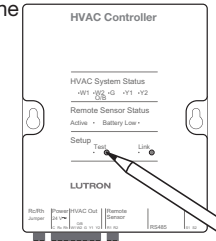
HVAC Controller



HVAC Controller Diagnostic Mode

The diagnostic mode is used to ensure the relays on the HVAC controller are functioning and wired properly to your HVAC system.

Follow the steps below to test your wiring using diagnostic mode. There are three Diagnostic Mode tests. The test that is cycled is determined by the 2 dipswitches on the HVAC Controller. The dipswitches define whether the HVAC system is used with a Conventional system or a Heat Pump system.



1. Enter HVAC Diagnostic Mode

Press and hold "Test" button for 10 seconds to enter Diagnostic Mode until "Test" LED flashes rapidly. "Test" LED will flash slowly while in Diagnostic Mode.

2. Cycle through the test steps

The dipswitch settings determine which test cycle will be run. Tap the "Test" button to advance through the diagnostic steps. Use the tables below to determine the test sequence that will be run on your system. Each tap moves the HVAC controller to the next step and will turn on and off different relays and corresponding LEDs. At each step, the thermostat wiring can be verified. **NOTE:** There is a 20 second minimum delay between each step.

Table 1 Conventional System Diagnostic Test Cycle (Dipswitches: S1 = On or Off, S2 = Off)

Step	Conventional System	Heat Pump System
Step 1	All Off	All Off
Step 2	Heat Stage 1 and Fan On	W1 and G On
Step 3	Heat Stage 1 & 2 and Fan On	W1, W2 (O/B), and G On
Step 4	All Off	All Off
Step 5	Cool Stage 1 and Fan On	G and Y1 On
Step 6	Cool Stage 1 & 2 and Fan	On G, Y1, and Y2 On
Step 7	All Off	All Off
Step 8	Fan On	G On

Table 2 Heat Pump System Diagnostic Test Cycle (Dipswitch S1 = Off, S2=On)

Step	Conventional System	Heat Pump System
Step 1	All Off	All Off
Step 2	Heat Stage 1 and Fan On	G and Y1 On
Step 3	Heat Stage 1 & 2 and Fan On	G, Y1, and Y2 On
Step 4	Auxiliary Heat On	W1 and G On
Step 5	All Off	All Off
Step 6	Cool Stage 1 and Fan On	W2 (O/B), G, and Y1 On
Step 7	Cool Stage 1 & 2 and Fan On	W2 (O/B), G, Y1, and Y2 On
Step 8	All Off	All Off
Step 9	Fan On	G On

Table 3 Heat Pump System Diagnostic Test Cycle (Dipswitch S1 = On, S2=On)

Step	Conventional System	Heat Pump System
Step 1	All Off	All Off
Step 2	Heat Stage 1 and Fan On	W2 (O/B), G, and Y1 On
Step 3	Heat Stage 1 & 2 and Fan On	W2 (O/B), G, Y1, and Y2 On
Step 4	Auxiliary Heat On	W1 and G On
Step 5	All Off	All Off
Step 6	Cool Stage 1 and Fan On	G and Y1 On
Step 7	Cool Stage 1 & 2 and Fan On	G, Y1, and Y2 On
Step 8	All Off	All Off
Step 9	Fan On	G On

3. Exit HVAC Diagnostic Mode

At any time, press and hold "Test" button for 10 seconds to exit Diagnostic Mode. If no button is pressed for 3 minutes, the HVAC Controller will exit Diagnostic Mode.

Relay Contact Ratings

Table 4

Voltage	Resistive Load	Inductive Load
Up to 24 V~	1 A	0.1 A

HVAC Out
Terminal connections for connecting to the HVAC system

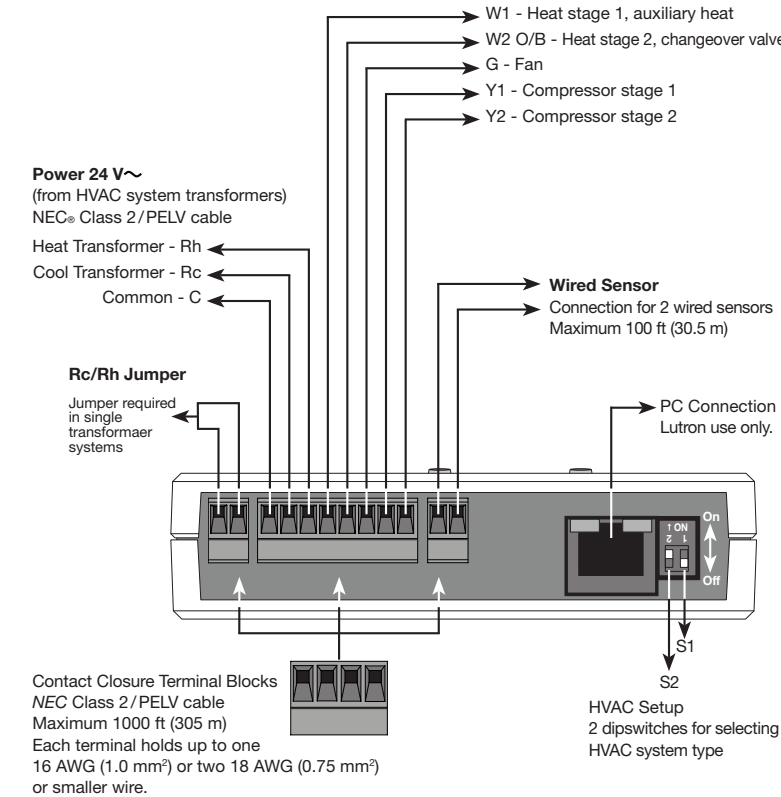


Table 5

System Configuration	S1	S2
Standard - Gas (Default)	Off	Off
Heat Pump - Changeover Cool	Off	On
Standard - Electric	On	Off
Heat Pump - Changeover Heat	On	On

Troubleshooting Guide for HVAC Controller

Symptom	Probable Cause and Action
LEDs on the HVAC Controller do not turn on when it is powered up.	Power Not Present • Circuit Breaker is OFF or tripped. Reset or turn on circuit breaker.

Returning an HVAC Controller to Factory Settings

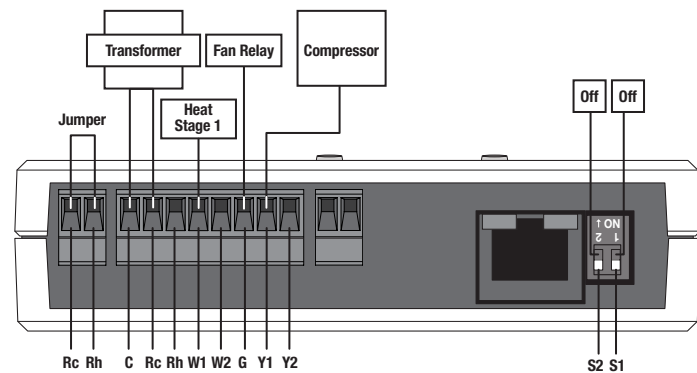
Note: Returning the HVAC Controller to factory settings will erase all system programming from the HVAC Controller and will require the HVAC Controller to be reprogrammed into a system.

- Triple tap and hold either button on an HVAC Controller. DO NOT release the button after the third tap.
- Keep the button pressed on the third tap until the LED(s) start to flash slowly (approximately 3 seconds).
- Release the button and immediately triple tap it again. The LEDs will flash quickly. When the LEDs stop flashing, the HVAC Controller has been returned to factory settings.

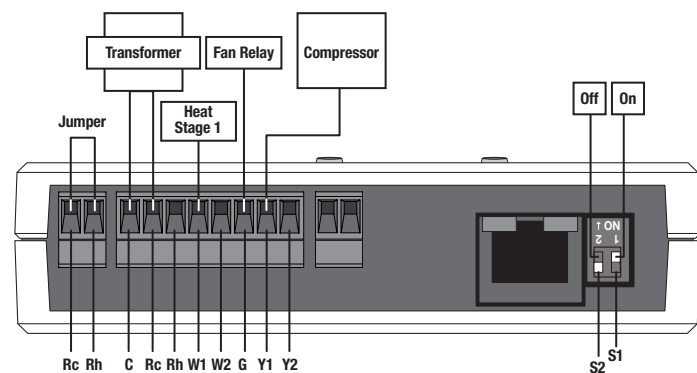
Wiring Your System

Conventional System

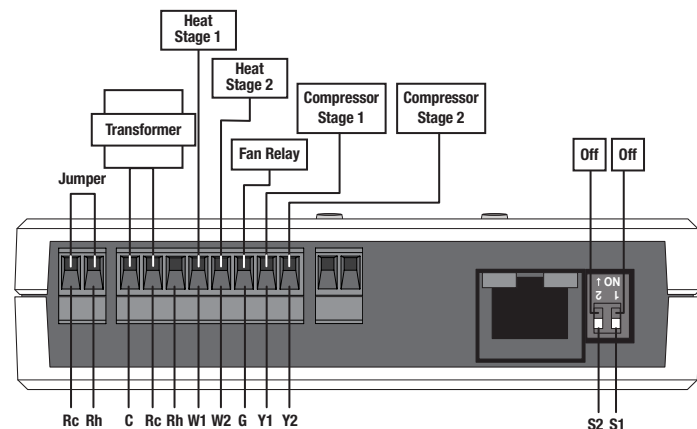
Conventional Gas/Oil Heat System • 1 Stage Heat / 1 Stage Cool



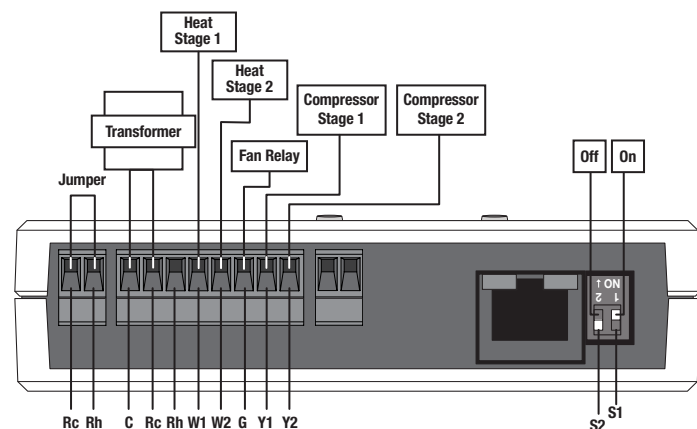
Conventional Electric Heat System • 1 Stage Heat / 1 Stage Cool



Conventional Gas/Oil Heat System • 2 Stage Heat / 2 Stage Cool

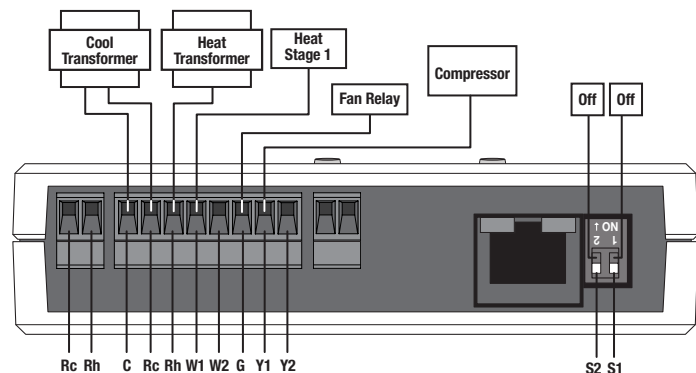


Conventional Electric Heat System • 2 Stage Heat / 2 Stage Cool

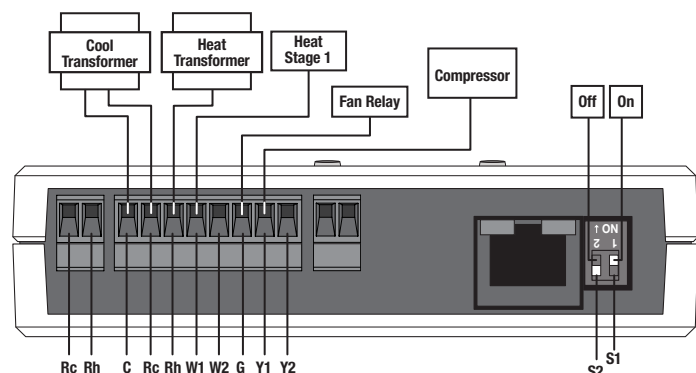


Conventional System (continued)

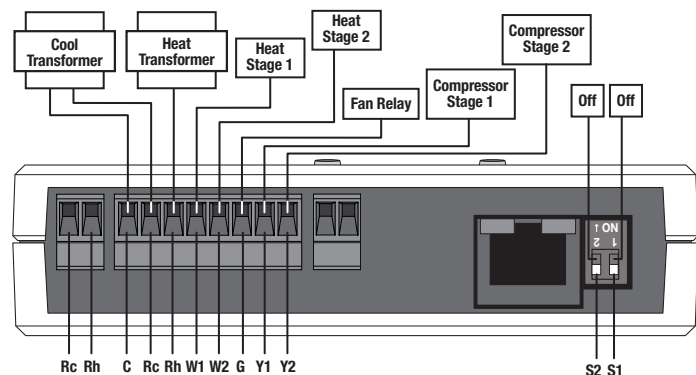
Conventional Gas/Oil Heat System • 1 Stage Heat / 1 Stage Cool, 2 Transformers



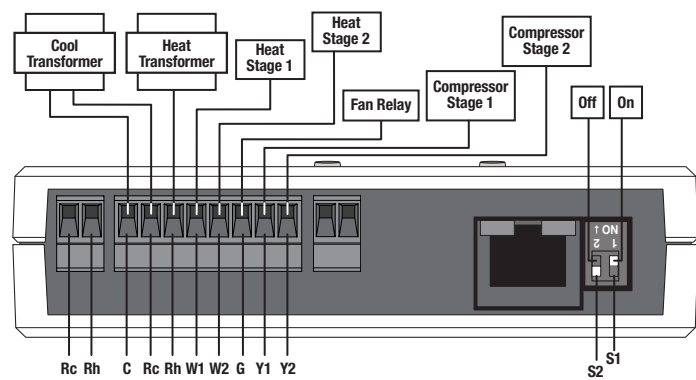
Conventional Electric Heat System • 1 Stage Heat / 1 Stage Cool, 2 Transformers



Conventional Gas/Oil Heat System • 2 Stage Heat / 2 Stage Cool, 2 Transformers

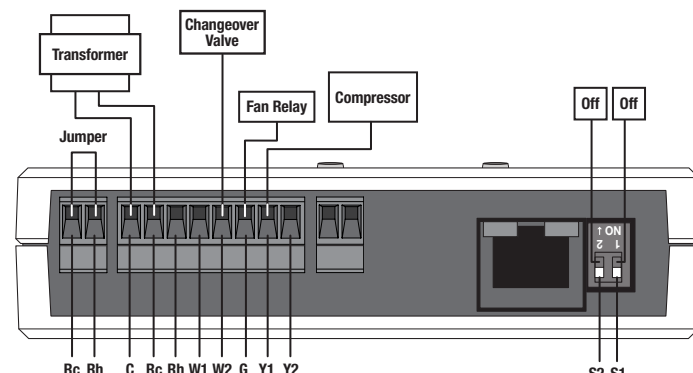


Conventional Electric Heat System • 2 Stage Heat / 2 Stage Cool, 2 Transformers

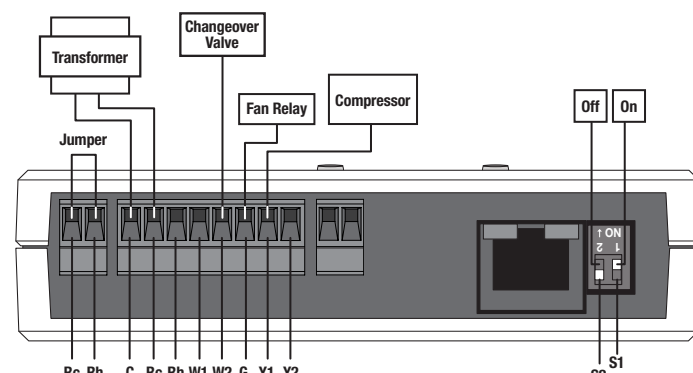


Heat Pump System

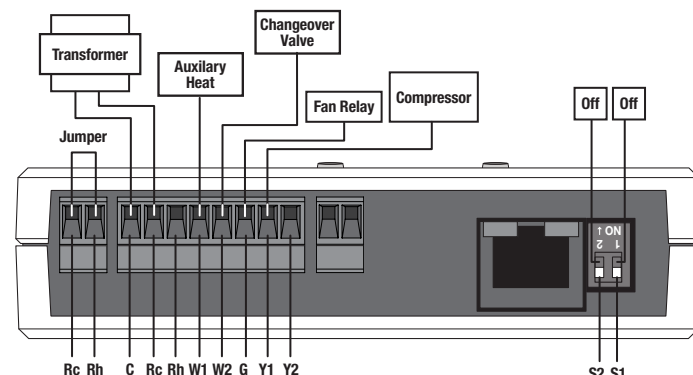
Single Stage Heat Pump (Changeover = Cool)



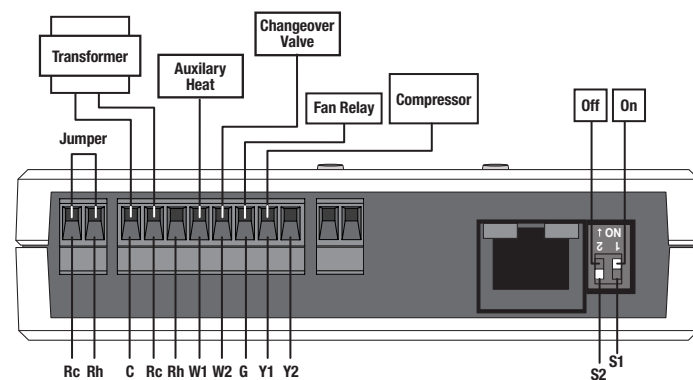
Single Stage Heat Pump (Changeover = Heat)



Single Stage Heat Pump w/ Auxiliary Heat (Changeover = Cool)

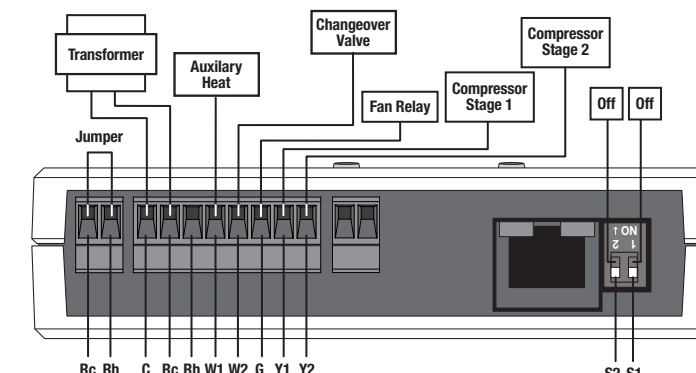


Single Stage Heat Pump w/ Auxiliary Heat (Changeover = Heat)



Heat Pump System (continued)

2 Stage Heat Pump w/ Auxiliary Heat (Changeover = Cool)



2 Stage Heat Pump w/ Auxiliary Heat (Changeover = Heat)

