Robertshaw®

RS9110

Installation Manual

INSTALLATION MANUAL

This manual covers the following models: **RS9110**

Thermostat Applications Guide

Description	
Gas or Oil Heat	Yes
Electric Furnace	Yes
Heat Pump (No Aux. or Emergency Heat)	Yes
Heat Pump (With Aux. or Emergency Heat)	No
Multi-stage Systems	No
Heat Only Systems	Yes
Heat Only Systems - Floor or Wall Furnace	Yes
Cool Only Systems	Yes
Millivolt	Yes

Table of Contents

Power Type

Battery Power
Hardwire (Common Wire)
Hardwire (Common Wire) with Battery Backup

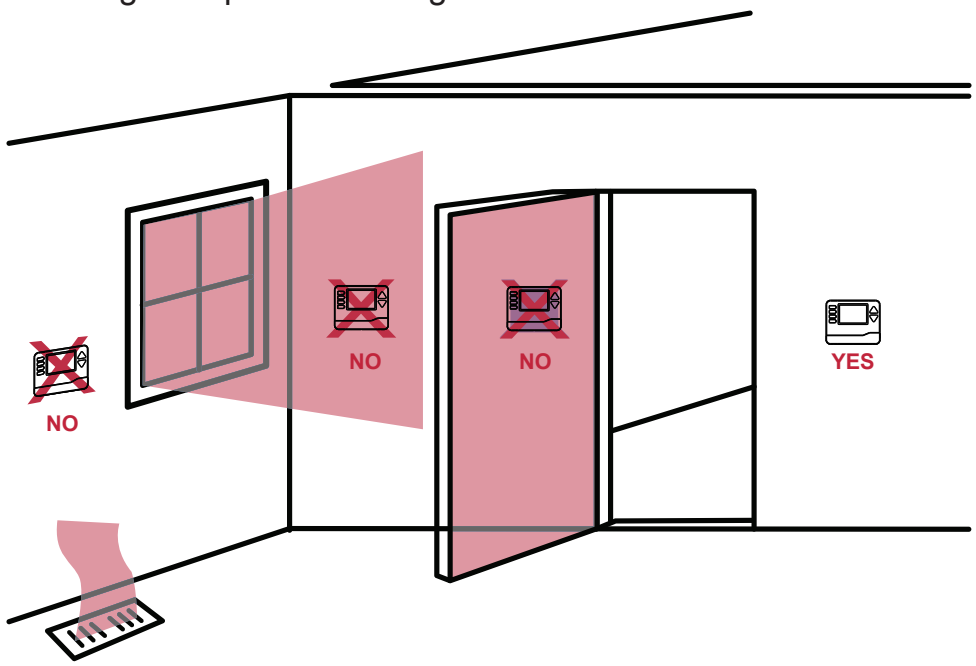
A trained, experienced technician must install this product.

Carefully read these instructions. You could damage this product or cause a hazardous condition if you fail to follow these instructions.

INSTALLATION TIPS

Wall locations

The thermostat should be installed approximately 4 to 5 feet above the floor.
Select an area with average temperature and good air circulation.



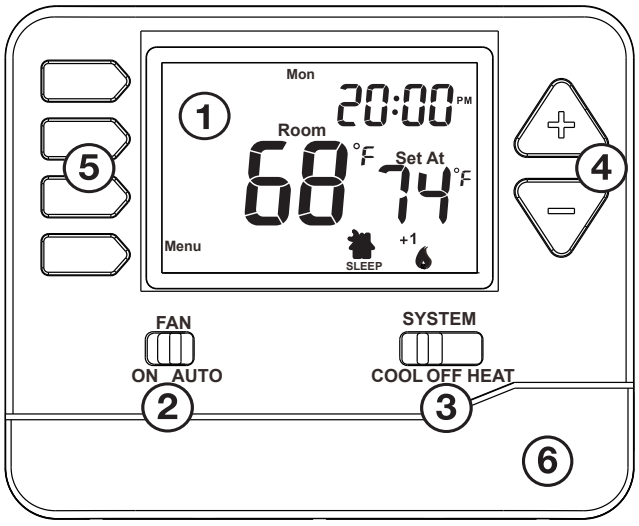
Do not install thermostat in locations:
- Close to hot or cold air ducts
- That are in direct sunlight
- With an outside wall behind the thermostat
- In areas that do not require heating and/or cooling
- Where there are dead spots or drafts (in corners or behind doors)
- Where there might be concealed chimneys or pipes

Tip

Pick an installation location that is easy for the user to access. The temperature of the location should be representative of the building.

THERMOSTAT QUICK REFERENCE

Getting to know your thermostat

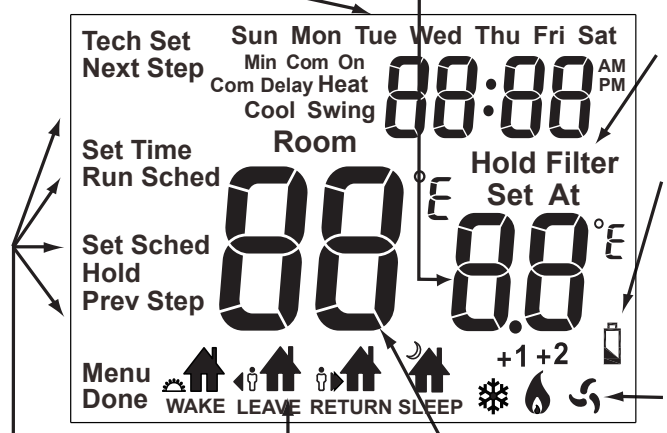


1. LCD Screen
2. Fan Switch
3. System Switch
4. Temperature Setpoint Buttons
5. User Buttons
6. Easy Change Battery Door

1 LCD

Days of the week and time.

Displays the user selected setpoint temperature.



Hold: Is displayed when thermostat program is permanently overridden.

Low Battery Indicator: Replace batteries when indicator is shown.

System Operation Indicators: The ❄, 🔥 or 🌀 icon will display when the COOL, HEAT, or 🌀 (fan) is on.

NOTE: The compressor delay feature is active if these icons are flashing. The compressor will not turn on until the 5 minute delay has elapsed.

Button Options

Programmable Time Periods: This thermostat has 4 programmable time periods per day.

Indicates the current room temperature.

SUBBASE INSTALLATION

Caution:
Electrical Hazard

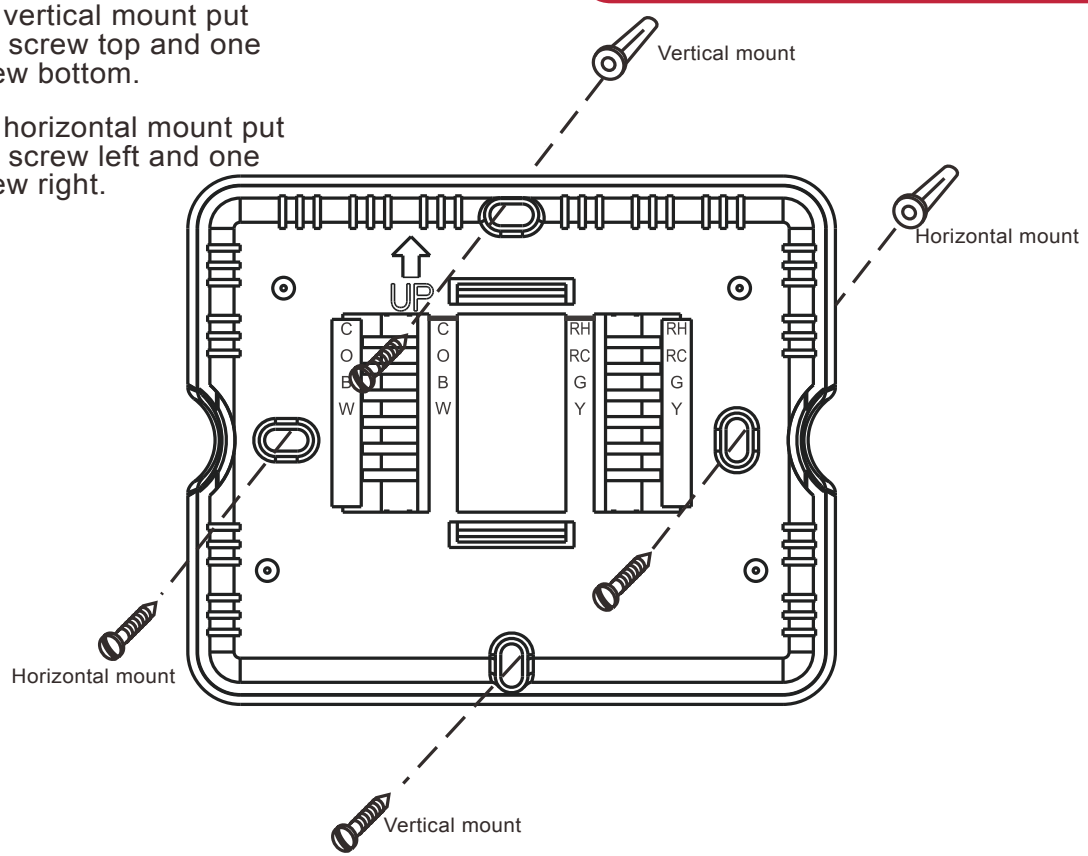
Failure to disconnect the power before beginning to install this product can cause electrical shock or equipment damage.

Mercury Notice:

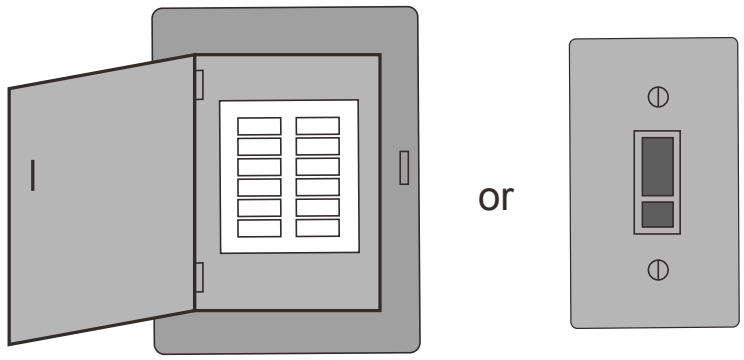
All of our products are mercury free. However, if the product you are replacing contains mercury, dispose of it properly. Your local waste management authority can give you instructions on recycling and proper disposal.

For vertical mount put one screw top and one screw bottom.

For horizontal mount put one screw left and one screw right.



1 Turn Off Power to Heating/Cooling System



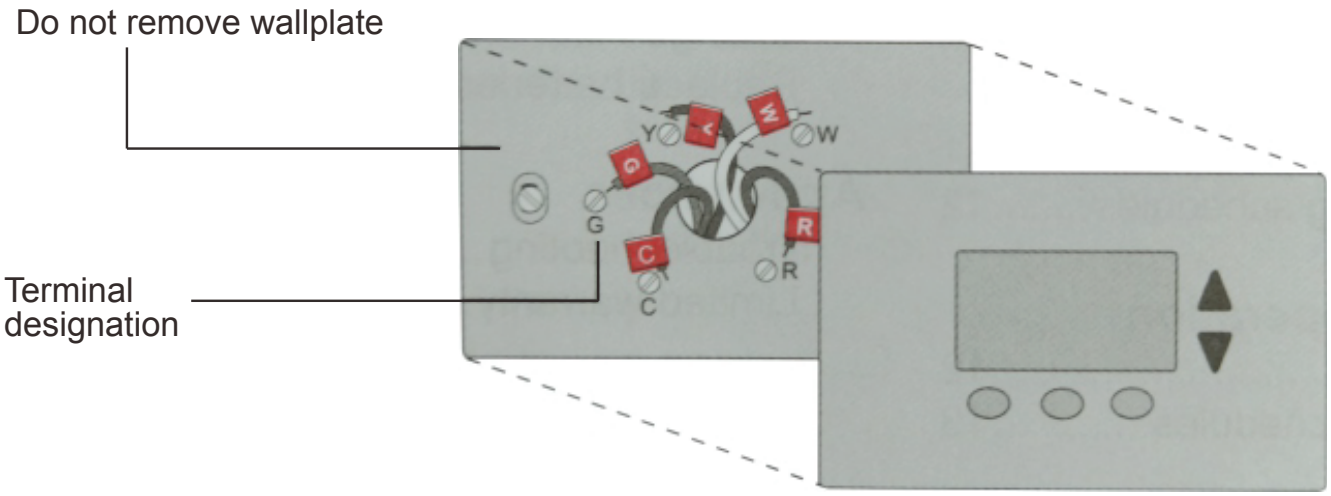
Circuit breaker box

or

Heating/cooling system power switch

2 Remove Old Thermostat

Remove old thermostat but leave wallplate with wires attached.



WIRING

3 Label Wires with Tags

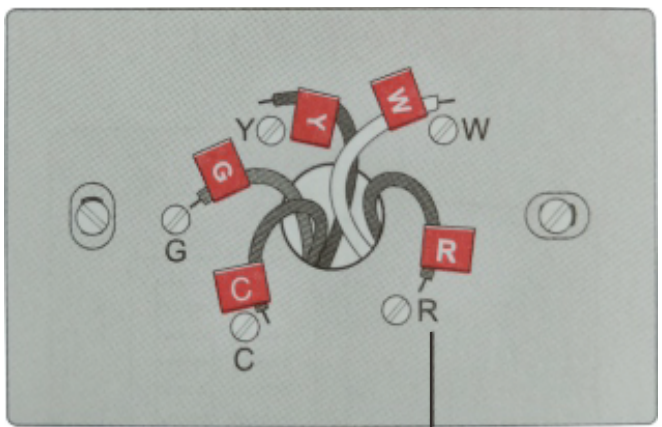
Label the wires using the supplied wire labels as you disconnect them.

Wiring Labels

Apply these wiring labels to each wire with the appropriate terminal designation as you remove it from the existing thermostat.

B	B	Y2	Y2	C	C	E	E	F	F
G	G	H	H	L	L	O	O	P	P
R	R	RC	RC	RH	RH	T	T	U	U
V/VR	V/VR	W	W	W1	W1	W2	W2	W3	W3
X	X	X1	X1	X2	X2	Y	Y	Y1	Y1
AUX	AUX								

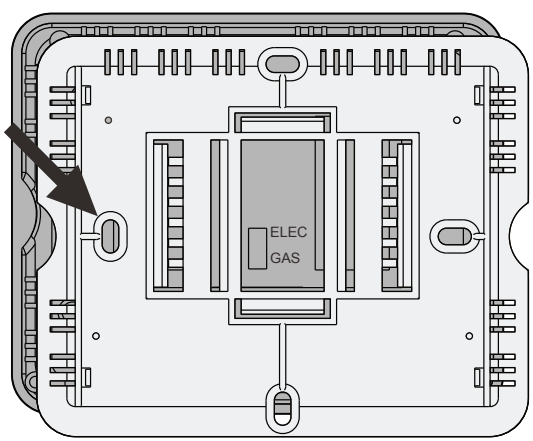
Wire Labels



Terminal designation

4 Separate Wallplate from New Thermostat

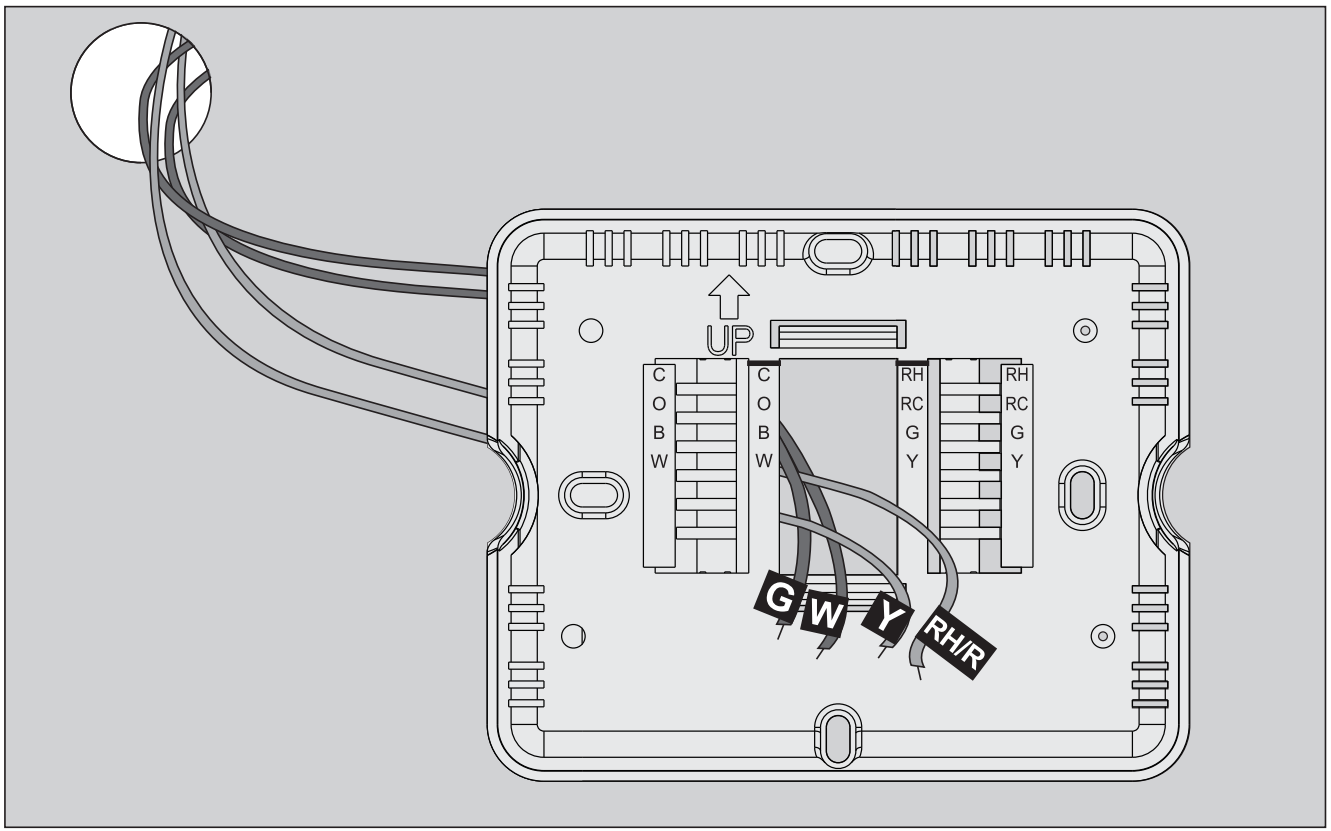
Remove wallplate from the new thermostat and mount onto wall.



Wallplate

5 Mount Wallplate for New Thermostat

Mount the new wallplate using the included screws and anchors.



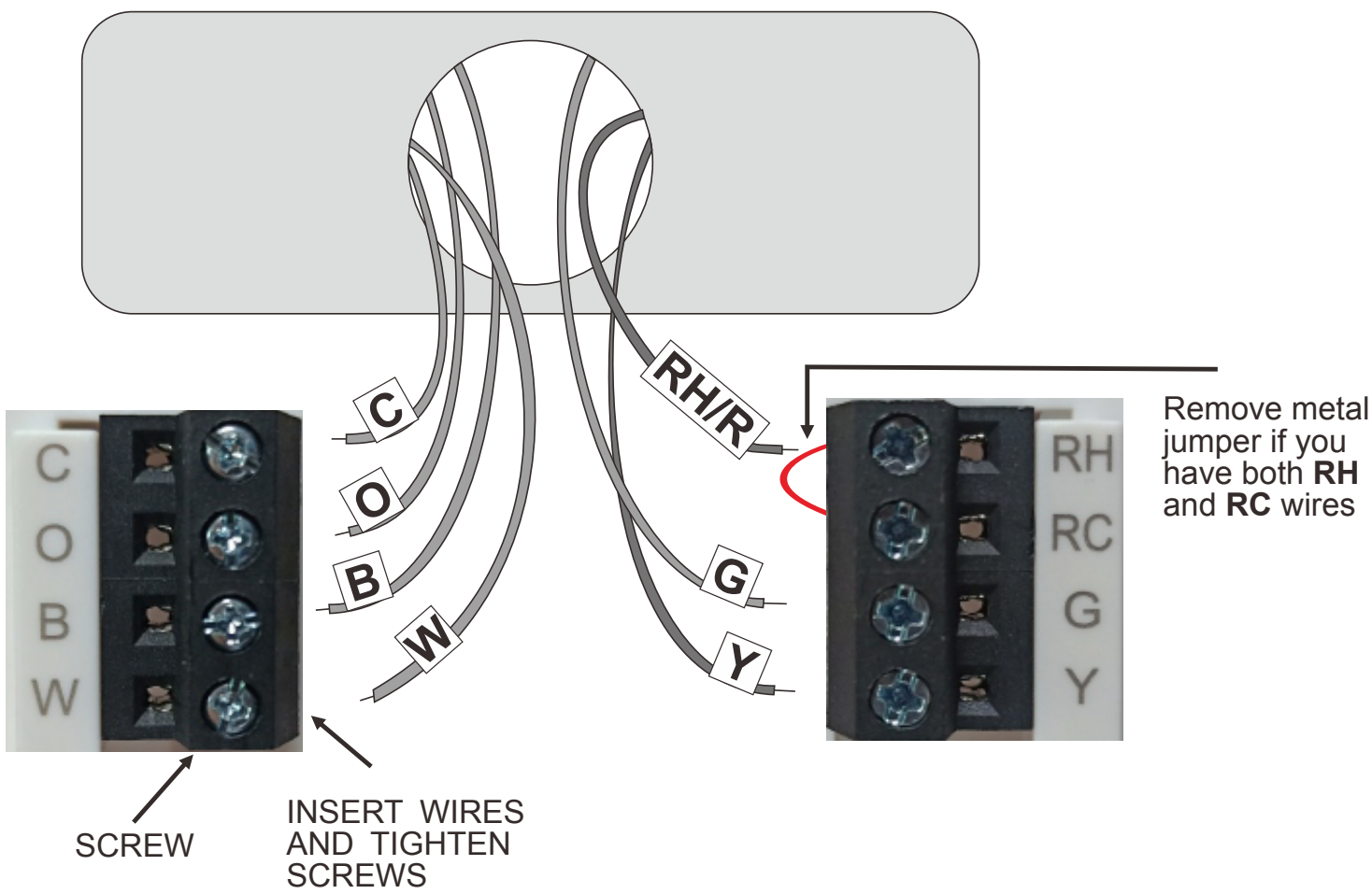
Drill 3/16-in. holes for drywall
Drill 3/16-in. holes for plaster

WIRING

6 Connect Wires

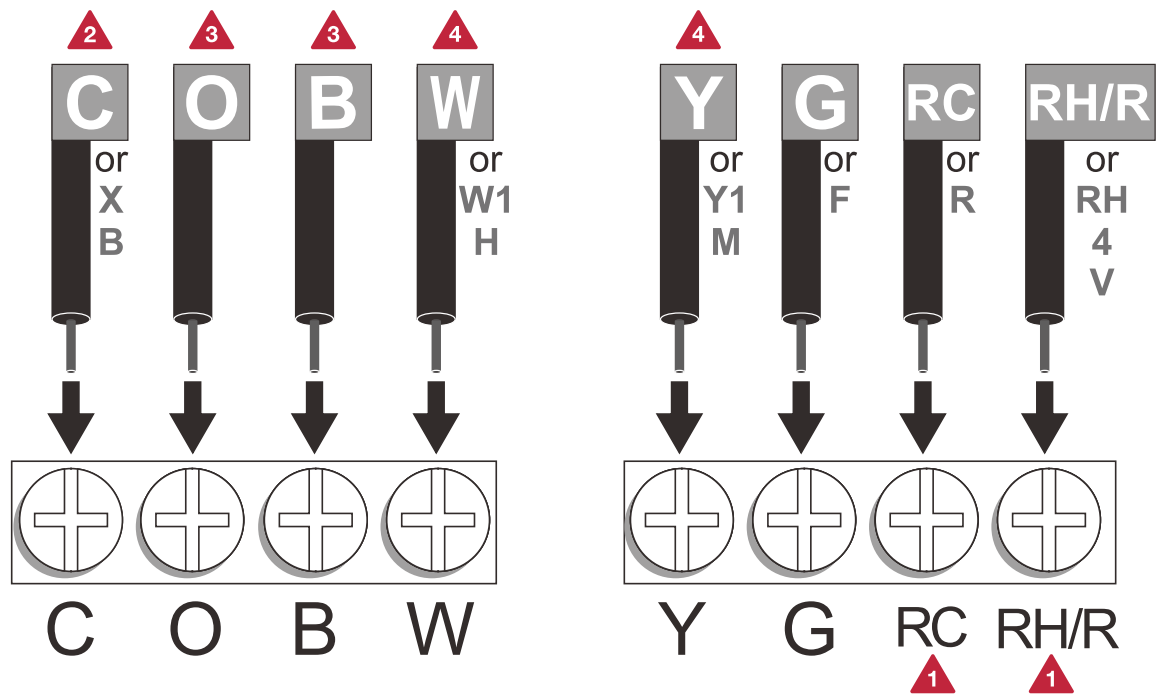
Simply match wire labels.

If labels do not match letters on the thermostat, check “Alternate Wiring (Conventional Systems)” on page 9 and connect to terminal as shown (see notes, below).



Alternate Wiring (Conventional Systems)

If labels do not match letters on the thermostat, check the chart below and connect to terminal as shown here (See notes, below).



1. If wires will be connected to both **RC** and **RH/R** terminals, remove metal jumper.
2. If **C** or **X** wire is available then you can connect with **C** terminal. If there is no **C** or **X** wire then no need to connect with C terminal.
3. If you <u>have</u> a **heat pump** without auxiliary/backup heat connect **O** or **B**, <u>not</u> both. If you do <u>not have</u> a **heat pump**, do not connect **B**. Wrap bare end of wire with electrical tape.
4. Place a jumper (piece of wire) between **Y** and **W** if you are using a heat pump without auxiliary/backup heat.

WIRING

Caution: Electrical Hazard
Failure to disconnect the power before beginning to install this product can cause electrical shock or equipment damage.

Warning:
All components of the control system and the thermostat installation must conform to Class II circuits per the NEC Code.

Wiring

1. If you are replacing a thermostat, make note of the terminal connections on the thermostat that is being replaced. In some cases the wiring connections will not be color coded. For example, the green wire may not be connected to the **G** terminal.
2. Loosen the terminal block screws. Insert wires then retighten terminal block screws.

Terminal Designations

W Heat relay G Fan relay Y Compressor relay

O Heat pump reversing valve energized in cooling

RC Transformer power for cooling

RH Transformer power for heating

B Heat pump reversing valve energized in heating

C Common wire from system transformer

Tips:

RH & RC terminals

For single transformer systems, leave the jumper wire in place between RH and RC. Remove jumper wire for two transformer systems.

Heat pump systems (With No AUX or Emergency Heat)

If wiring to a heat pump, use a small piece of wire (not supplied) to connect terminals W and Y.

C terminal

The C (common wire) terminal does not have to be connected when the thermostat is powered by batteries.

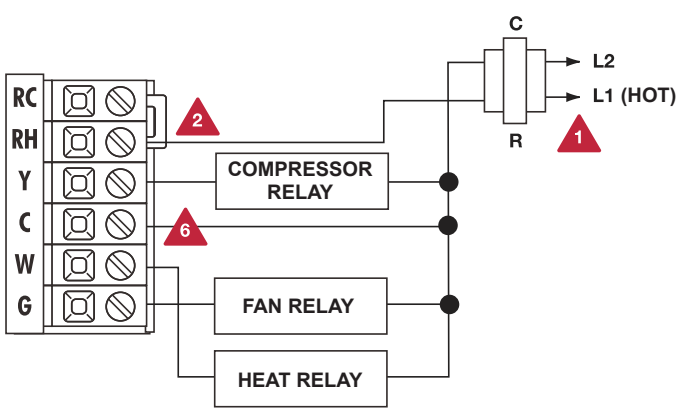
Wire specifications

Use shielded or non-shielded 18-22 gauge thermostat wire.

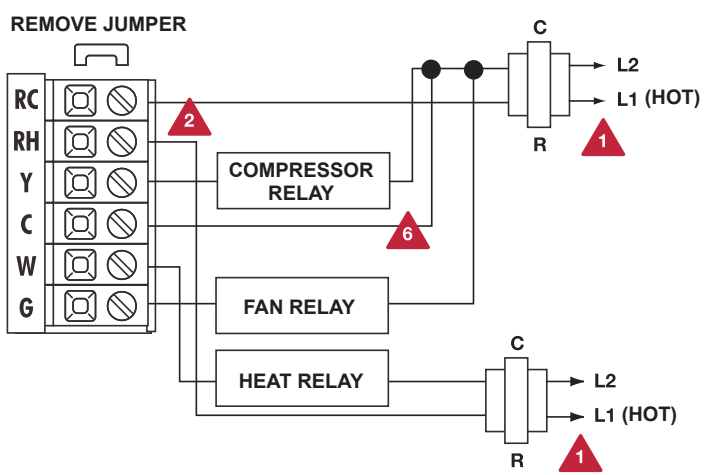
WIRING

1. Power supply.
2. Factory-installed jumper. Remove only when installing on 2-transformer systems.
3. Use either O or B terminals for reversing valve.
4. Use a small piece of wire (not supplied) to connect W and Y terminals.
5. Set fan operation switch to electric.
6. Optional 24 VAC common connection when thermostat is used in battery power mode.

Typical 1H/1C system: 1 transformer

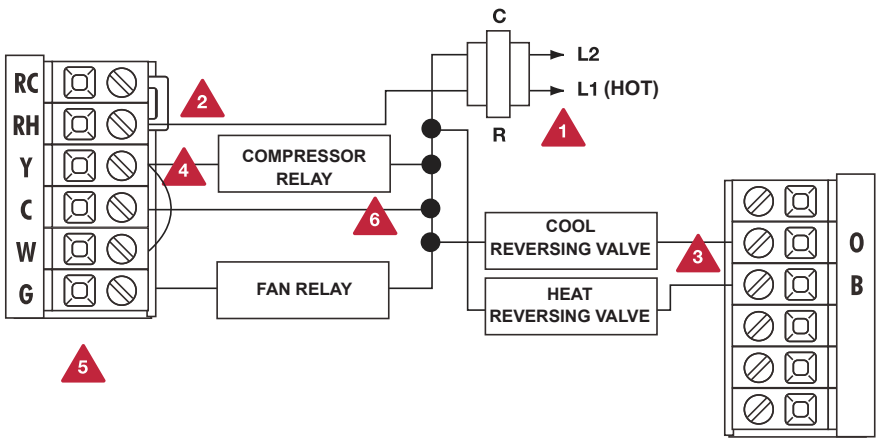


Typical 1H/1C system: 2 transformers

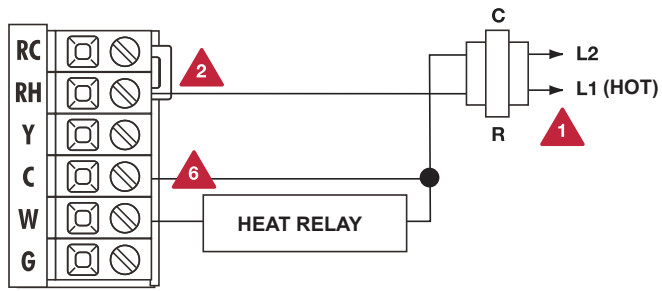


WIRING

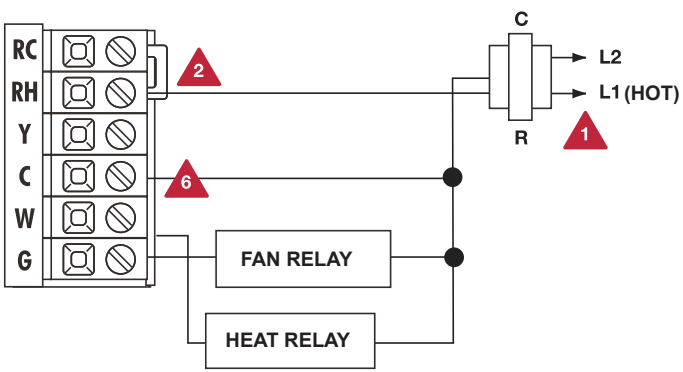
Typical 1H/1C heat pump system



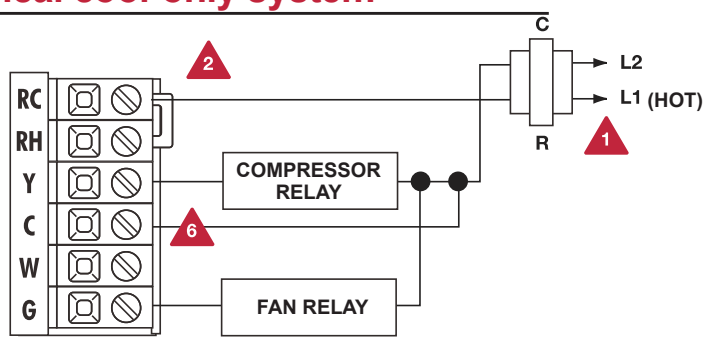
Typical heat-only system



Typical heat-only system with fan



Typical cool-only system



Technician Setup Menu

This thermostat has a technician setup menu for easy installer configuration. To setup the thermostat for your particular application:

1. Press **MENU** button
2. Press and hold **TECH SET** button for 3 seconds. This 3 second delay is designed so that homeowners do not accidentally access the installer settings.
3. Configure the installer options as desired using the table below.

   Use the  or  keys to change settings and the **NEXT STEP** or **PREV STEP** key to move from one option to another. **Note:** Only press **DONE** key when you want to exit the Technician Setup options.

Tip

Temperature differential or swing, sometimes called cycle rate, can be customized for this individual application. For most applications choose a differential setting that is as long as possible without making the occupants uncomfortable.

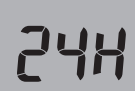
TECHNICIAN SETUP MENU

Tech Settings		LCD Will Show Adjustment Options		Default
Filter Change Reminder	This feature will flash **FILT** in the display after the elapsed run time to remind the user to change the filter. A setting of **OFF** will disable this feature.		You can adjust the filter change reminder from **OFF** to 2000 hours of run time in 50 hour increments. Tap the second button from the top left side of the thermostat to display the current filter elapsed run time.	**OFF**
Room Temperature Calibration	This feature allows the installer to change the calibration of the room temperature display. For example, if the thermostat reads 70° and you would like it to read 72° then select +2.		You can adjust the room temperature display to read 3° above or below the factory calibrated reading.	**0**
Minimum Compressor On Time	This feature allows the installer to select the minimum run time for the compressor. For example: A setting of 4 will force the compressor to run for at least 4 minutes every time the compressor turns on, regardless of the room temperature.		You can select the minimum compressor run time from **OFF**, 3, 4, or 5 minutes. If 3, 4 or 5 is selected, the compressor will run for at least the selected time before turning off.	**OFF**

TECHNICIAN SETUP MENU

Tech Settings		LCD Will Show Adjustment Options		Default
Compressor Short Cycle Delay	The compressor short cycle delay protects the compressor from short cycling. This feature will not allow the compressor to be turned on for 5 minutes after it was last turned off.		Selecting **ON** will not allow the compressor to be turned on for 5 minutes after the last time the compressor was on. Select **OFF** to remove this delay.	ON
Cooling Differential or Swing	The differential setting, often called cycle rate or anticipation, is adjustable. A smaller differential setting will cause more frequent cycles and a larger differential setting will cause fewer cycles.		The cooling differential setting is adjustable from 0.2° to 2°. For example: A differential setting of 0.5° will turn the cooling on at approximately 0.5° above the setpoint and turn the cooling off at approximately 0.5° below the setpoint.	0.5
Heating Differential or Swing	The differential setting often called cycle rate or anticipation, is adjustable. A smaller differential setting will cause more frequent cycles and a larger differential setting will cause fewer cycles.		The heating differential setting is adjustable from + 0.2° to + 2°. For example: A differential setting of 0.5° will turn the heating on at approximately 0.5° below the setpoint and turn the heating off at approximately 0.5° above the setpoint.	0.4

TECHNICIAN SETUP MENU

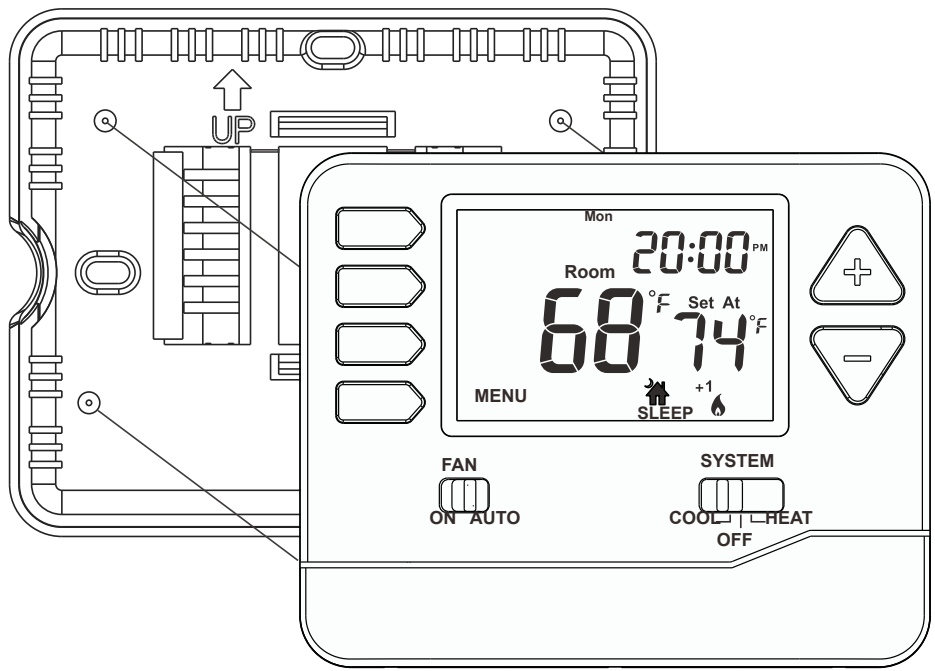
Tech Settings		LCD Will Show	Adjustment Options	Default
F or C	Select F for Fahrenheit temperature readout or select C for Celsius readout.	Next step  Prev step	F for Fahrenheit C for Celsius	F
12 or 24 Hour Clock	You can select either a 12 or 24 hour clock setting.	Next step  Prev step	Use the [+] and [-] to select 12 or 24 hour clock.	12
Fan Operation	Select **GAS** for sytems that control the fan during a call for heat. Select **ELEC** to have the thermostat control the fan during a call for heat.	Next step  Prev step	GAS - GS or ELEC - EL	GAS

Tech Settings		LCD Will Show Adjustment Options		Default
Program Options	You can configure this thermostat to have 7 Day, 5+1+1 programming or non-programmable. Note: If 7d is selected, in set schedule you will program all seven days individually. If 5d is selected, in set schedule you will program Monday - Friday together and Saturday and Sunday individually. If 0d is selected the thermostat becomes non-programmable and the Set Schedule button goes away in Menu.		Use the [+] and [-] key to select **7d** for 7 Day, **5d** for 5+1+1, or **0d** for non-programmable.	5d

ATTACH FACEPLATE & INSTALL BATTERY

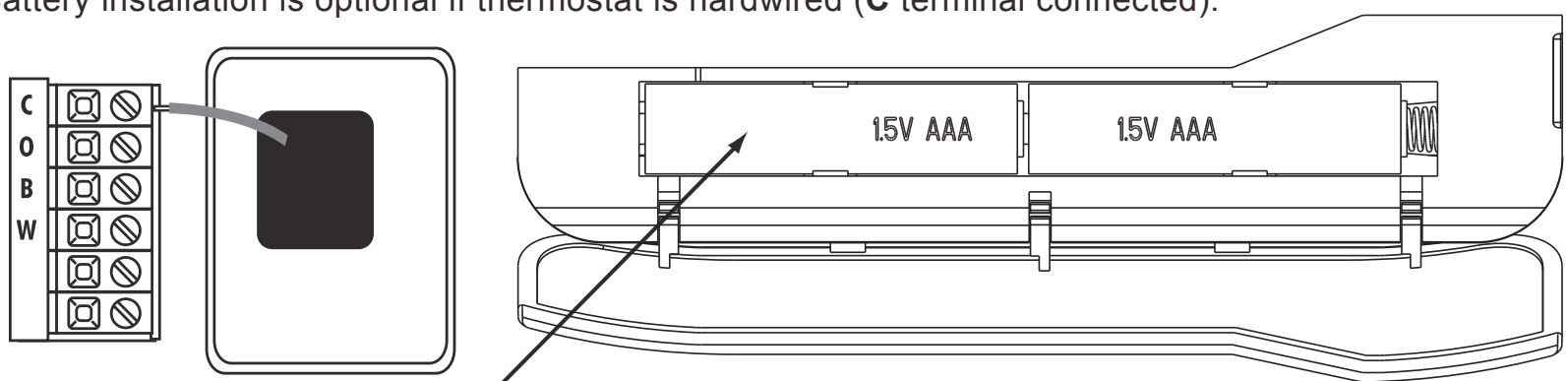
Attach Faceplate

Align the 4 tabs on the subbase with corresponding slots on the back of the thermostat, then push gently until the thermostat snaps in place.



Battery Installation

Battery installation is optional if thermostat is hardwired (**C** terminal connected).



Insert 2 AAA Alkaline batteries.

Set Time

Follow the steps below to set the day of the week and current time:

1. Press **MENU.**
2. Press **SET TIME.**
3. Day of the week will be flashing. Use the  or  key to select the current day of the week.
4. Press **NEXT STEP.**
5. The current hour is flashing. Use the  or  key to select the current hour. When using 12-hour time, make sure the correct a.m. or p.m. choice is selected.
6. Press **NEXT STEP.**
7. Minutes are now flashing. Use the  or  or key to select current minutes.
8. Press **DONE** when completed.

Programming

All programmable thermostats are shipped with an energy saving pre-program. You can customize this default program by following the steps below.

Your thermostat can be programmed to have all the weekdays the same, a separate program for Saturday, and a separate program for Sunday. There are four time periods for each program (**WAKE, LEAVE, RETURN, SLEEP**).

PROGRAMMING

Factory Default Program				
Day of the Week	Events	Time	Setpoint Temperature (Heat)	Setpoint Temperature (Cool)
Weekday	Wake	6 a.m.	70° F (21° C)	75° F (24° C)
	Leave	8 a.m.	62° F (17° C)	83° F (28° C)
	Return	6 p.m.	70° F (21° C)	75° F (24° C)
	Sleep	10 p.m.	62° F (17° C)	78° F (26° C)
Saturday	Wake	8 a.m.	70° F (21° C)	75° F (24° C)
	Leave	10 a.m.	62° F (17° C)	83° F (28° C)
	Return	6 p.m.	70° F (21° C)	75° F (24° C)
	Sleep	11 p.m.	62° F (17° C)	78° F (26° C)
Sunday	Wake	8 a.m.	70° F (21° C)	75° F (24° C)
	Leave	10 a.m.	62° F (17° C)	83° F (28° C)
	Return	6 p.m.	70° F (21° C)	75° F (24° C)
	Sleep	11 p.m.	62° F (17° C)	78° F (26° C)

You can use the table below to plan your customized program schedule.

Programming Table				
Day of the Week	Events	Time	Setpoint Temperature (Heat)	Setpoint Temperature (Cool)
Weekday	Wake			
	Leave			
	Return			
	Sleep			
Saturday	Wake			
	Leave			
	Return			
	Sleep			
Sunday	Wake			
	Leave			
	Return			
	Sleep			

PROGRAMMING

Set Program Schedule

To customize your program schedule, follow these steps

Weekday:

1. Select **HEAT** or **COOL** from the system switch.
   Note: You have to program heat and cool separately.
2. Press **MENU.**
3. Press **SET SCHED**. Note: Monday-Friday is displayed and the **WAKE** icon is shown. You are now programming the wake time period for the weekday setting.
4. Time is flashing. Use the  or  key to make your time selection for the weekday **WAKE** time period.
5. Press **NEXT STEP.**
6. The setpoint temperature is flashing. Use the  or  key to make your setpoint selection for the weekday wake period.
7. Press **NEXT STEP.**
8. Repeat steps 4 through 7 for weekday **LEAVE** time period, for weekday **RETURN** time period, and for weekday **SLEEP** time period.

Saturday:

9. Repeat steps 4 through 7 for Saturday **WAKE** time period, for Saturday **LEAVE** time period, for Saturday **RETURN** time period, and for Saturday **SLEEP** time period.

Sunday:

10. Repeat steps 4 through 7 for Sunday **WAKE** time period, for Sunday **LEAVE** time period, for Sunday **RETURN** time period, and for Sunday **SLEEP** time period.

Specifications

The display range of temperature	41°F to 95°F (5°C to 35°C)
The control range of temperature	44°F to 90°F (7°C to 32°C)
Load rating	1 amp per terminal, 1.5 amp maximum all terminals combined
Display accuracy	± 1°F
Differential (cycle rate or swing)	Heating is adjustable from 0.2°F to 2.0°F Cooling is adjustable from 0.2°F to 2.0°F
Power source	18 to 30 VAC, NEC Class II, 50/60 Hz for hardwire (common wire) Battery power from 2 AAA Alkaline batteries
Operating ambient temperature	32°F to +105°F (0°C to +41°C)
Operating humidity	90% non-condensing maximum
Dimensions of thermostat	4.72”W x 3.86”H x 0.98”D

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