

Robertshaw®

RS9220

Installation Manual

Thank you for purchasing a Robertshaw® thermostat.

This manual will describe how to install and test the Robertshaw **RS9220** thermostat.

Thermostat System Types

Gas, Oil, or Electric Heat with Air Conditioning
Heat Pumps (without auxiliary or emergency heat)
Multi-Stage Systems
Heat-Only, including for Floor and Wall-Furnace
Cool-Only
750 Millivolt Heating Systems

Power Options

Battery Power

Hardwire (Common Wire)

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IMPORTANT SAFETY INFORMATION WARNING:

- Always turn off power at the main power source by unscrewing fuse or switching circuit breaker to the off position before installing, removing, cleaning, or servicing thermostat.
- Read all of the information in this manual before installing or programming this thermostat.
- This is a 24V AC low voltage thermostat. Do not install on voltages higher than 30V AC.
- All wiring must conform to local and national building and electrical codes and ordinances.
- Do not short (jumper) across terminals on the gas valve or at the system control to test installation. This will damage the thermostat and void the warranty.

INSTALLATION LOCATION

Install the thermostat 4 to 5 feet above the floor in an area with good air circulation and average temperature.

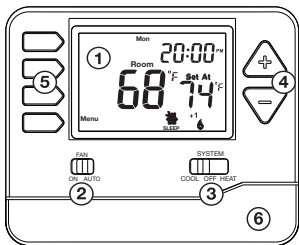
For new installations, mount thermostat on an inside wall, 4-5 feet above the floor. Do not install the thermostat in the following locations:

- Behind a Door
- In a Corner
- Near Air Vents
- In Direct Sunlight
- With an Outside Wall Behind the Thermostat
- Near any Heat or Steam Generating Fixtures
- Near any Concealed Pipes or Chimneys

Installation at these locations will affect thermostat operation.

THERMOSTAT QUICK REFERENCE

Getting to know your thermostat

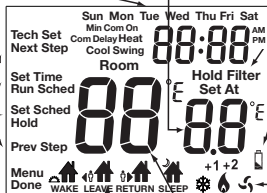


- 1 LCD Screen
- 2 Fan Switch
- 3 System Switch
- 4 Temperature Set-Point Buttons
- 5 User Buttons
- 6 Easy Change Battery Door

1 LCD

Days of the week and time.

Displays the user selected set-point temperature.



Button Options

Programmable Time Periods:

This thermostat has 4 programmable time periods per day.

Indicates the current room temperature.

Hold: Is displayed when thermostat program is 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: If these icons are flashing, there is a 5-minute delay for compressor protection.

WALLPLATE INSTALLATION



Caution: Electrical Hazard

Disconnect power before installing this product. Failure to do so can cause electric shock or equipment damage.

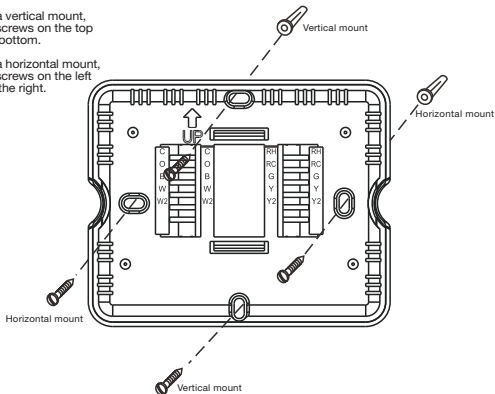


Mercury Notice:

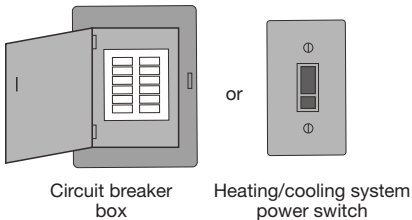
This product is mercury-free. However, if this product is replacing a control which contains mercury, it needs to be disposed of properly. Contact your local waste management authority for instructions regarding recycling and proper disposal of the control.

For a vertical mount,
put screws on the top
and bottom.

For a horizontal mount,
put screws on the left
and the right.



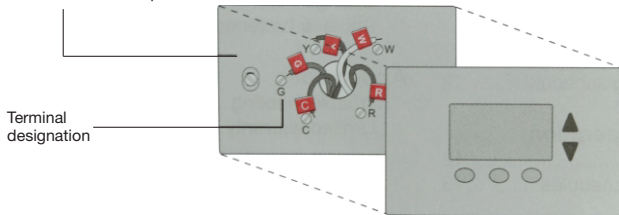
1 Turn Off Power to Heating/Cooling System



2 Remove Old Thermostat

Remove old thermostat but leave wallplate with wires attached.

Do not remove wallplate



WIRING

3 Label Wires with Tags

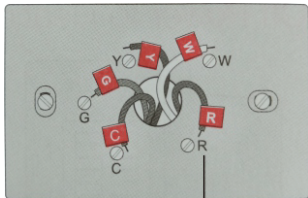
Label the wires using the supplied wire labels as you disconnect them.

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								

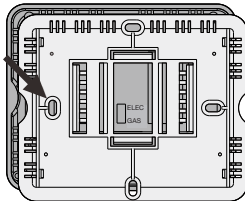
Wire Labels



Terminal designation

4 Separate Wallplate from New Thermostat

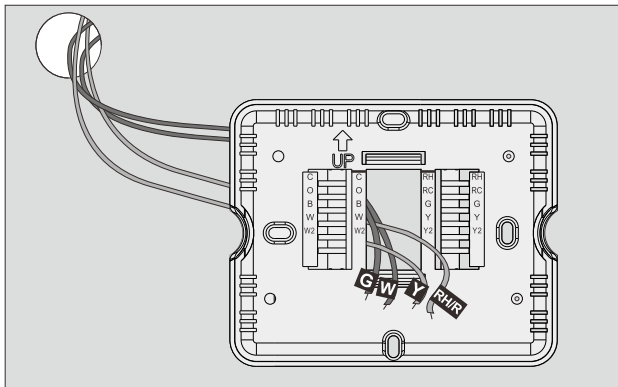
Remove wallplate from the new thermostat and mount onto wall.



Wallplate

5 Mount Wallplate for New Thermostat

Mount the new wallplate using the included screws and anchors.



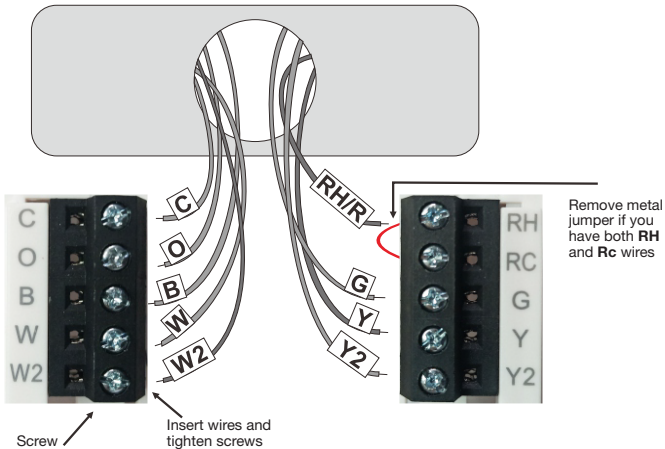
Drill 3/16-in. holes for drywall
 Drill 3/16-in. holes for plaster

WIRING

6 Connect Wires

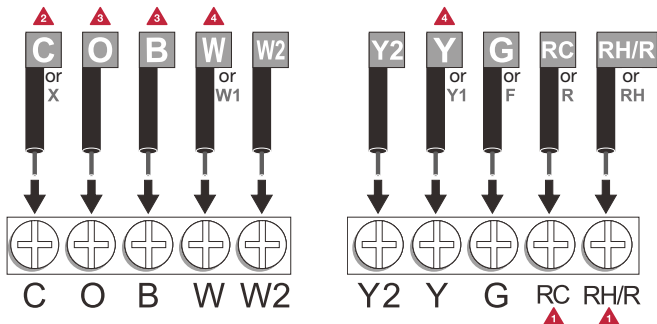
Simply match wire labels.

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 there is **C** or **X** wire 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 have a **heat pump** without auxiliary/backup heat connect either the **O** or **B**, not both. If you do not have a **heat pump**, do not connect **O** or **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

Terminal Designations

- C** 24 VAC Common
- O** Heat pump reversing valve energized
In cooling
- B** Heat pump reversing valve energized
in heating
- W** Heat relay Stage 1
- W2** Heat relay Stage 2
- RH** 24 VAC power for heating
- RC** 24 VAC power for cooling
- G** Fan relay
- Y** Compressor relay Stage 1
- Y2** Compressor relay Stage 2

Notes

Wire specifications

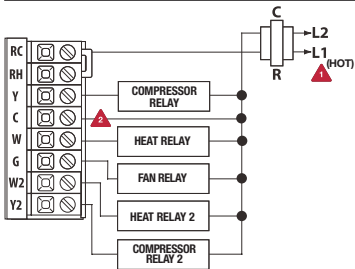
Use 18- to 22-gauge thermostat wire.
Shielded wire is not required.

Common wire

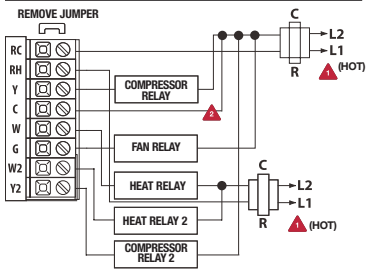
The C (common wire) is optional when
the thermostat is powered by batteries.

- 1** Power supply.
- 2** Optional 24 VAC common connection when thermostat is used in battery power mode.

Typical 2H/2C System: 1 Transformer

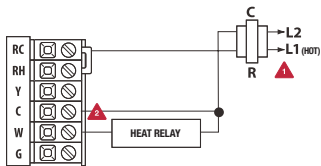


Typical 2H/2C System: 2 Transformers

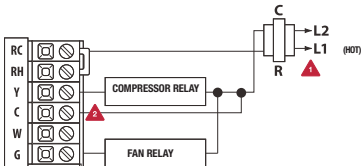


WIRING

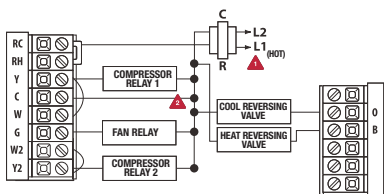
Typical Heat-Only System



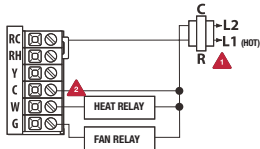
Typical Cool Only System



Typical 2H/2C Heat Pump System w/o Aux.





Typical Heat-Only System With Fan



Installer Setup Menu

This thermostat has an installer setup menu for easy configuration. Follow the procedure below to set up the thermostat to match the specific heating/cooling system.

1. Press **MENU**.
2. Press and hold **TECH SET** for 3 seconds.
3. Configure the installer options as desired using the table below.

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



INSTALLER SETUP MENU

Settings	Display	Adjustment Options	Default
Filter Change Reminder	<p>This setting will flash FILT in the display after the elapsed run time to remind the user to change the filter. The OFF setting will disable this feature.</p>	<p>The filter change reminder can be adjusted from OFF to 2000 hours in 50 hour increments. Press the second button from the top left side of the thermostat to display the current filter elapsed run time.</p>	OFF
Room Temperature Calibration	<p>This setting allows the installer to change the calibration of the room temperature display so that, for example, the thermostat would read 72°F instead of 70°F.</p>	<p>The room temperature display can be adjusted to read up to 3° above or below the factory calibrated temperature.</p>	0
Minimum Compressor On-Time	<p>The installer can select the minimum run time for the compressor to help protect the compressor from short-cycling.</p>	<p>The minimum compressor run time can be adjusted from OFF to 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 (although the fan may continue to run for a short time).</p>	OFF



INSTALLER SETUP MENU

Settings	Display	Adjustment Options	Default
<p>Compressor Short Cycle Delay</p>	<p>The compressor short cycle delay setting will not allow the compressor to be turned on for 5 minutes after it was last turned off in order to protect the compressor.</p>	<p>The compressor short cycle delay setting can be removed by selecting OFF.</p>	<p>ON</p>
<p>Cooling Differential</p>	<p>The cooling differential is factory preset at 0.5°. This means that whenever the room temperature heats by 0.5° full degree from the temperature setting, the cooling system will turn on. If the cooling system turns on too often, increase the temperature differential.</p>	<p>The cooling differential setting is adjustable from 0.2°F to 2°F.</p>	<p>0.5</p>
<p>Heating Differential</p>	<p>The heating differential is factory preset at 0.4°. This means that whenever the room temperature cools by 0.4° from the temperature setting, the heating system will turn on. If the heating system turns on too often, increase the temperature differential.</p>	<p>The heating differential setting is adjustable from 0.2°F to 2°F.</p>	<p>0.4</p>

INSTALLER SETUP MENU

Settings		Display	Adjustment Options	Default
For C	Select F for Fahrenheit temperature display or select C for Celsius display.	Next step 82 °F Prev step	F for Fahrenheit C for Celsius	F
12 or 24 Hour Clock	Select a 12 or 24 hour clock setting.	Next step 24H Prev step	Use  and  to select 12 or 24 hour clock.	12
Fan Operation	Select GAS or ELEC depending on the type of furnace.	Next step GAS Prev step	GAS - GS or ELEC-EL	GAS

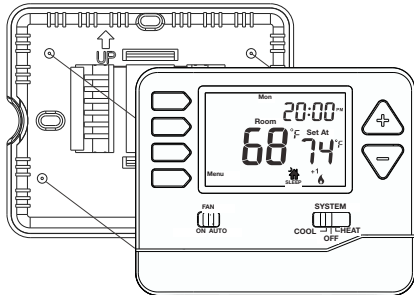
INSTALLER SETUP MENU

Settings	Display	Adjustment Options	Default
<p>Program Options</p> <p>This thermostat can be configured to have 7 Day, 5+1+1 programming or be non-programmable.</p> <p>If 7 Day is selected, in Set Time all seven days will need to be programmed individually.</p> <p>If 5+1+1 programming is selected, in Set Time Monday–Friday will be programmed together and Saturday and Sunday will need to be programmed individually.</p> <p>If 0d is selected, the thermostat becomes non-programmable.</p>	<p>Next step</p> <p>Pr 00</p> <p>5d</p> <p>Prev step</p>	<p>Use  and  to select 7d for 7 Day, 5d for 5+1+1, or 0d for non-programmable.</p>	<p>5d</p>

MOUNTING & BATTERY INSTALLATION

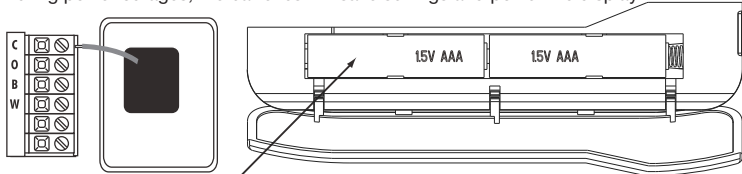
Mounting Thermostat

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









Battery Installation

Battery installation is optional if used with AC power (the **C** terminal is connected). During power outages, the batteries will save settings and power the display.



Insert 2 AAA
Alkaline batteries.













Set Time of Day and Day of Week

1. Press **MENU**.
2. Press **SET TIME**.
3. Day of the week will be flashing. Use  or  to select the current day of the week.
4. Press **NEXT STEP**.
5. The current hour will be flashing. Use  or  to select the current hour.
Note the correct a.m. or p.m. indicator is selected.
6. Press **NEXT STEP**.
7. The minutes will be flashing. Use  or  to select the current minutes.
8. Press **DONE** when completed.

PROGRAMMING

























Default Program

This thermostat is pre-programmed for energy saving operation. The default program is below:

Default Program				
Day of the Week	Events	Time	Set-Point Temperature (Heat)	Set-Point 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)

PROGRAMMING

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





Custom Program				
Day of the Week	Events	Time	Set-Point Temperature (Heat)	Set-Point Temperature (Cool)
Weekday	Wake  			
	Leave  			
	Return  			
	Sleep  			
Saturday	Wake  			
	Leave  			
	Return  			
	Sleep  			
Sunday	Wake  			
	Leave  			
	Return  			
	Sleep  			

PROGRAMMING

Custom Programming

This thermostat can be configured to have 7 Day or 5+1+1 programming. If 7 Day is selected, all seven days will need to be programmed individually. If 5+1+1 programming is selected, Monday–Friday will be programmed together and Saturday and Sunday will need to be programmed individually. There are four time periods for each day (**WAKE**, **LEAVE**, **RETURN**, **SLEEP**).

Follow the steps below to customize your program schedule:

1. Select **HEAT** or **COOL**. Note: Heat and cool need to be programmed separately.
2. Press **MENU** (If menu does not appear first, press **RUN SCHED**).
3. Press **SET SCHED**. Note: Monday–Friday (or Monday if in 7 Day mode) will be displayed and the **WAKE** icon is shown.
4. Time will be flashing. Use  or  to make your time selection for the **WAKE** time period for Monday–Friday (or Monday if in 7 Day mode).
5. Press **NEXT STEP**.
6. The set-point temperature will be flashing. Use  or  to make your set-point selection for the **WAKE** time period for Monday–Friday (or Monday if in 7 Day mode).
7. Press **NEXT STEP**.
8. Repeat steps 4 through 7 for the **LEAVE** time period, for the **RETURN** time period, and for the **SLEEP** time period for Monday–Friday (or Monday if in 7 Day mode).
9. Repeat steps 4 through 8 for the Saturday **WAKE**, **LEAVE**, **RETURN**, and **SLEEP** time periods, and then again for the Sunday **WAKE**, **LEAVE**, **RETURN**, and **SLEEP** time periods for the 5+1+1 program schedule, and for each day for the 7-day program schedule.

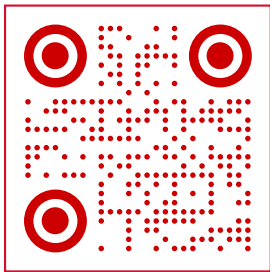
Specifications

Temperature Display Range.....	41°F to 95°F (5°C to 35°C)
Temperature Control Range.....	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	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	4.72"W x 3.86"H x 0.98"D



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6 Year
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Warranty

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