

Robertshaw[®]

RS10420T

Installation Manual



INSTALLATION MANUAL

The Robertshaw® Programmable WiFi Thermostat allows you to control the temperature anytime and anywhere. It features a large backlit display and LCD touchscreen for ease of operation. Compatible with any IOS or Android Smartphone.

Thermostat Application 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)	Yes
Multi-Stage Systems	Yes
Heat Only Systems	Yes
Cool Only Systems	Yes
Millivolt	Yes

Power Type

Hardwire (Common Wire)

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

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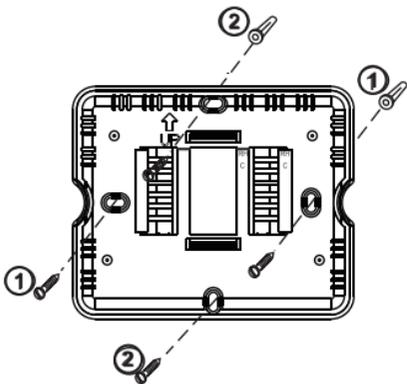
Specifications

Display range of temperature	32°F to 99°F (0°C to 40°C)
Control range of temperature	41°F to 90°F (5°C to 32°C)
Load rating	1 amp per terminal, 1.5 amp maximum all terminals combined
Differential (cycle rate or swing)	Heating is adjustable from 0.2° to 2.0° Cooling is adjustable from 0.2° to 2.0°
Power source	18 to 30 VAC, NEC Class II, 50/60 Hz for hardwire
Operating ambient temperature.....	32°F to +105°F (0°C to +41°C)
Operating humidity	90% non-condensing maximum
Dimensions of thermostat	4.7"W x 4.4"H x 1"D

INSTALLATION TIPS

Subbase Installation

- ① Horizontal Mount
- ② Vertical Mount



For vertical mount put one screw on the top and one screw on the bottom.
For horizontal mount put one screw on the left and one screw on the right.

Installation Tip: **Electrical Hazard**

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

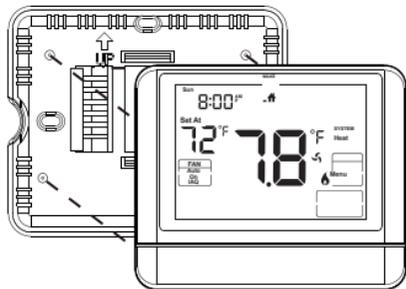
Mercury Notice

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.

INSTALLATION TIPS

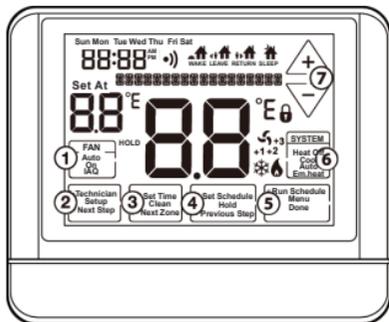
Mount Thermostat

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.

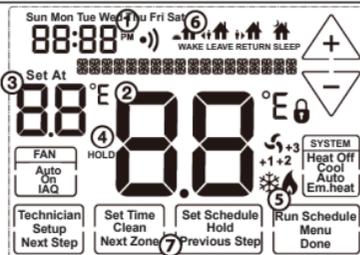


THERMOSTAT QUICK REFERENCE

Getting to know your thermostat



- 1 Fan Buttons
- 2 Next Step Buttons
- 3 Set Time Buttons
- 4 Program Buttons
- 5 Menu Buttons
- 6 System Buttons
- 7 Setpoint Buttons



- 1 Days of the week and time
- 2 Indicates the current room temperature
- 3 Displays the user selectable setpoint temperature
- 4 Hold is displayed when thermostat program is permanently overridden.
- 5 **System Operation Indicators:** The compressor delay is active if these are flashing.
- 6 **Programmable Time Periods:** Residential uses 4 time periods - **WAKE, RETURN, LEAVE and SLEEP.**
- 7 **Program Menu Options:** Shows different options during programming.

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 are 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 the terminal block screws.



Installation Tip

Do not overtighten terminal block screws, as this can damage the terminal block. A damaged terminal block can keep the thermostat from fitting on the subbase correctly or cause system operation issues.

Max Torque = 6in/lbs.

Terminal Designations

The following terminals on the thermostat wallplate are wired according to the type of HVAC system it's connected to and how the thermostat is configured.

		Y1	Y2	W/E	W2	0	B
CONVENTIONAL HVAC		COOL MODE STAGE 1	COOL MODE STAGE 2	HEAT MODE STAGE 1	HEAT MODE STAGE 2	-	-
HEAT PUMP	1H/1C	HEAT 1 COOL 1				HEAT PUMP REVERSING VALVE - ENERGIZED DURING COOLING	HEAT PUMP REVERSING VALVE - ENERGIZED DURING HEATING
	2H/1C			AUX 1	HEAT 2 AUX 2		
	3H/1C			HEAT 2 AUX 1	HEAT 3 AUX 2		
	2H/2C		HEAT 2 COOL 2				
	3H/2C		HEAT 2 COOL 2	AUX 1	HEAT 3 AUX 2		
	4H/2C		HEAT 2 COOL 2	HEAT 3 EMHEAT	HEAT 4 EMHEAT		



Note

Devices, such as a float switch that mechanically break circuits, should be installed so that they break the control wire (Y) not the power (R). Interrupting the power circuit will shut off the power to the thermostat completely and not allow it to operate.

WIRING

Wiring Tips

Wire Specifications

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

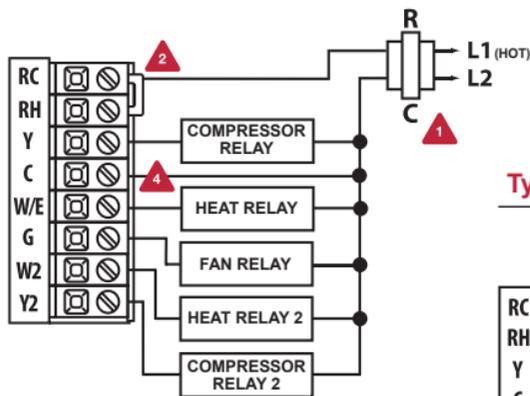
Note:

In many heat pump systems with no emergency heat relay, a jumper can be installed between **E** and **W2** to turn thermostat into a single stage control for Emergency Heat Operation.

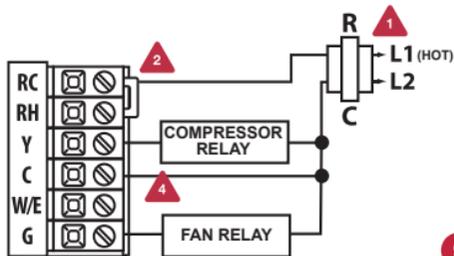
WIRING DIAGRAMS

- 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 24 VAC common connection

Typical 2H/2C System: 1 Transformer

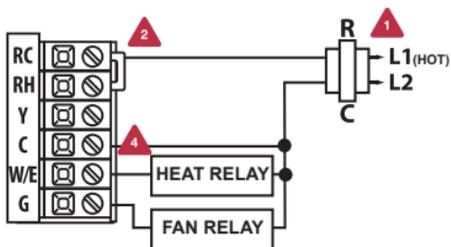


Typical Cool-Only System With Fan



WIRING DIAGRAMS

Typical Heat Only System With Fan

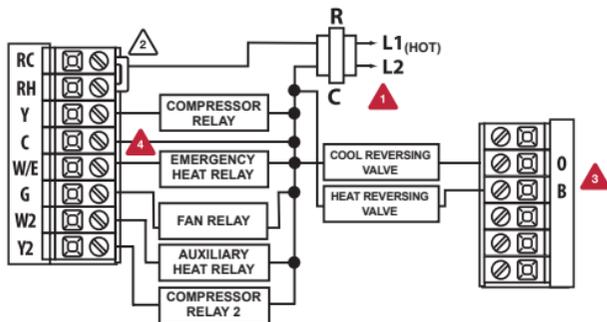


Note:

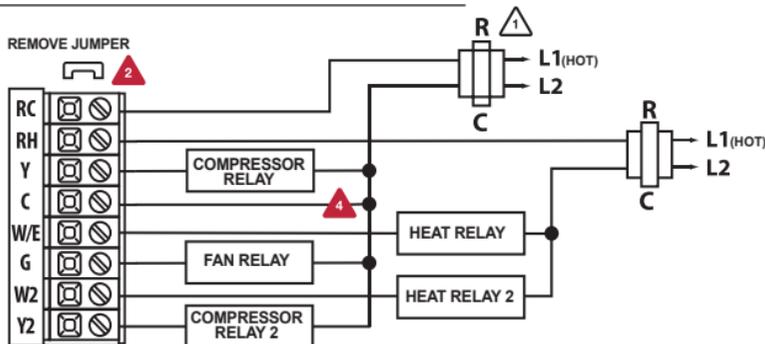
In many systems with no emergency heat relay, a jumper can be installed between E and W2.

WIRING DIAGRAMS

Typical 3H/2C or 2H/1C Heat Pump System



Typical 2H/2C System: 2 Transformers



TECHNICIAN SETUP

1. Press **MENU** button
2. Press and hold **TECHNICIAN SETUP** button for 3 seconds. This 3 second delay is designed so that end users do not accidentally access the installer settings.
3. Configure the installer options as desired using the table below.
4. Use the  or  keys to change settings and the **NEXT STEP** or **PREV STEP** key to move from one step to another. Note: Only press **DONE** key when you want to exit the Technician Setup options.

Tech Setup Steps		LCD Will Show	Adjustment Options	Default
Setup WiFi	WiFi router parameter configuration	WIRELESS SETUP		
Filter Change Reminder	This feature will flash a reminder in the display after the elapsed run time to remind the user to change the filter. A setting of OFF will disable this feature.	FILTER OFF SE	You can adjust the filter change reminder from OFF to 2000 hours of run time in 50 hour increments.	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° degrees and you would like it to read 72° then select +2.	CALIBRATE 0°F	You can adjust the room temperature display to read 4° above or below the factory calibrated reading.	0

TECHNICIAN SETUP

Tech Setup Steps	LCD Will Show	Adjustment Options	Default
<p>Minimum Compressor On Time</p> <p>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.</p>	<p>MIN COMP</p> <p>0F</p>	<p>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.</p>	<p>OFF</p>
<p>Compressor Short Cycle Delay</p> <p>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.</p>	<p>COMP PROTECTS</p> <p>0N</p>	<p>Selecting ON will not allow the compressor to be turned on for 5 minutes after the last time the compressor was switched off. Select OFF to remove this delay.</p>	<p>ON</p>
<p>Cooling Differential or Swing</p> <p>The differential or swing 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.</p>	<p>COOL SWING</p> <p>0.5°F</p>	<p>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.</p>	<p>0.5</p>

TECHNICIAN SETUP

Tech Setup Steps	LCD Will Show	Adjustment Options	Default
<p>Heating Differential or Swing</p> <p>The differential or swing 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.</p>	<p>HEAT SWING</p> <p>0.4°F</p>	<p>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.</p>	0.4
<p>Heat Pump</p> <p>When turned on, the thermostat will operate a heat pump. EM Heat will show as an option in the system switch tech setting. Use the  and  button to adjust.</p>	<p>HEAT PUMP</p> <p>OF</p>	<p>OFF configures the thermostat for conventional systems.</p> <p>ON configures the thermostat for heat pump systems.</p>	OFF
<p>System Set</p> <p>You can configure the system switch for the particular application. Heat - Off - Cool, Heat - Off, Cool - Off, Heat - Off - Cool - Auto.</p> <p>Note: Emergency Heat is available in heat pump mode only.</p>	<p>SYSTEM SET</p> 	<p>Use the  or  buttons until the desired application is flashing. AUTO = (Auto Changeover)</p>	OFF
<p>Stages of Heat + Cool</p> <p>You can configure this thermostat to operate up to 2H/2C conventional, or up to 4H/2C heat pump system.</p> <p>This step is shown only if heat pump is set to ON.</p>	<p>2H2C</p> <p>STGS. OF HEAT • COOL</p>	<p>Use the  or  key to first select stages of heat, press next, then select stages of cool. 3 or 4 heat will use Y1 and Y2 as 1st and 2nd stage of heat.</p>	2 STAGES

TECHNICIAN SETUP

Tech Setup Steps	LCD Will Show	Adjustment Options	Default
<p>Cooling Fan Delay</p> <p>The cooling fan delay setting will delay the fan from coming on in cool mode and keep it running after the compressor shuts off for a short time to save energy in some systems.</p>	<p>COOL FAN DELAY</p> <p>0F</p>	<p>You can set the cooling fan delay to OFF, 15, 30, 60 or 90 seconds. If 15, 30, 60, or 90 is selected the fan will not turn on for that many seconds when there is a call for cool and will run for that many seconds after satisfying a call for cool.</p>	<p>OFF</p>
<p>Heating Temperature Setpoint Limit</p> <p>This feature allows you to set a maximum heat setpoint value. The setpoint temperature cannot be raised above this value</p>	<p>HEAT LIMIT</p> <p>90°F</p>	<p>Use the \square or \square key to select the maximum heat setpoint.</p> <p>Range 44°F - 90°F</p>	<p>90°</p>
<p>Cooling Temperature Setpoint Limit</p> <p>This feature allows you to set a minimum cool setpoint value. The setpoint temperature cannot be lowered below this value.</p>	<p>COOL LIMIT</p> <p>44°F</p>	<p>Use the \square or \square key to select the minimum cool setpoint.</p> <p>Range 44°F - 90°F</p>	<p>44°</p>
<p>F° or C°</p> <p>Select F for Fahrenheit readout or select C for Celsius readout.</p>	<p>OF OR C SET</p> <p>83°F</p>	<p>°F for Fahrenheit</p> <p>°C for Celsius</p>	<p>F°</p>

TECHNICIAN SETUP

Tech Setup Steps	LCD Will Show	Adjustment Options	Default	
12 or 24	You can select either 12 or 24 hour clock setting.	12 H	Use the or key to select 12 or 24 hour clock.	12 Hour Clock
Fan Operation	Select GAS for heating systems that control the fan during a call for heat. Select ELEC to have the thermostat control the fan during a call for heat.	GAS FAN OPERATION	GAS or ELEC	GAS
Morning Recovery	This feature will start heating early to bring the building temperature to its programmed setpoint by the beginning of the WAKE time period.	MORNING RECOVERY ON	Use the or key to turn on or off.	ON
Display Light	The display light can be configured to operate 2 different ways – to come on when any key is pressed or to stay on All of the time.	AUTO dL	AUTO - Any key ON ON - Always ON	AUTO
Contractor Call Number	Allows you to put your phone number in the display. Selecting ON will enable this feature. OFF will disable this feature.	PHONE NUMBER OF	If selected On, you will see the input screen after pressing next step. Use the or keys to select the desired number and the FAN or SYSTEM key to move from one character to another. See Note on page 12 for operation.	OFF

TECHNICIAN SETUP

Tech Setup Steps		LCD Will Show	Adjustment Options	Default
Beep	When any key is pressed an audible beep will sound. There is an ON or an OFF .	<p>BEEP</p> <p>OF</p>	<p>If ON is selected the beep will sound.</p> <p>If OFF is selected, there is not sound.</p>	ON
MACID	This step shows the MAC address of WiFi module.	<p>MACID</p> <p>980863079022</p>		
Firmware Version	This step shows the version of firmware that is installed on the thermostat.	<p>FIRMEWAR</p> <p>VER 0100</p>	Press NEXT button to move to next step. Press DONE button to exit. Press and hold TECH button to enter ADVANCED TECH STEPS .	
Factory Default Reset	This step resets all WiFi settings to factory default.	<p>NO</p> <p>RESET</p> <p>TO DEFAULT</p>	Press YES to reset.	

PROGRAMMING

Differential or Swing Setting Tip

The second stage will turn on at 2x the differential setting. The second stage will turn off when 1x the differential is reached. For example, if the differential setting is .5 degrees for heating and the thermostat is set at 70°F, the first stage will turn on at approximately 69.5°F. The second stage will turn on at 69°F. The second stage will turn off at 69.5°F and the first will turn off at 70.5°F. If the third stage is used, it will turn on at 68.5°F and turn off at approximately 69°F.

A Note About Keypad Lockout:

The function of activating your lockout choice takes place after you have exited Tech Setup. To lock or unlock the keypad hold down the **MENU** for 3 seconds.

Contractor Call Number Note:

If contractor call number is selected **ON**, the respective phone number will show in the display if there has been a continuous call for heating or cooling for 24 hours or if the **FAN** button is held down for 3 seconds. To remove the phone number from the display, hold the **FAN** button down for 3 seconds.

Set Time of day and day of the week (If using programming)

1. Press the **MENU** button.
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**.
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**.
7. Minutes are now flashing. Use the or key to select current minutes.
8. Press **DONE** when completed.

PROGRAMMING

1. Select **HEAT** or **COOL** using the system key. **Note:** You have to program heat and cool separately.
2. Press **MENU**.
3. Press **SET SCHED**. **Note:** Monday is displayed and the **WAKE** icon is shown. You are now programming the **WAKE** time period for that day.
4. Time is flashing. Use the or key to make your time selection for that day's **WAKE** time period. **Note:** If you want the fan to run continuously during this time period, select **ON** with the **FAN** key.

5. Press **NEXT**.
6. The setpoint temperature is flashing. Use the or key to make your setpoint selection for that day's **WAKE** period.
7. Press **NEXT**.
8. Repeat steps 4 through 7 for that day's **LEAVE** time period, **RETURN** time period, and **SLEEP** time period.

Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday

Repeat steps 4 thru 7 for the remaining days of the week.

Programming

All of our programmable thermostats are shipped with an energy saving pre-program. 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 AM	70° F (21° C)	75° F (24° C)
	Leave	8 AM	62° F (17° C)	83° F (28° C)
	Return	6 PM	70° F (21° C)	75° F (24° C)
	Sleep	10 PM	62° F (17° C)	78° F (26° C)
Saturday	Wake	6 AM	70° F (21° C)	75° F (24° C)
	Leave	8 AM	62° F (17° C)	83° F (28° C)
	Return	6 PM	70° F (21° C)	75° F (24° C)
	Sleep	10 PM	62° F (17° C)	78° F (26° C)
Sunday	Wake	6 AM	70° F (21° C)	75° F (24° C)
	Leave	8 AM	62° F (17° C)	83° F (28° C)
	Return	6 PM	70° F (21° C)	75° F (24° C)
	Sleep	10 PM	62° F (17° C)	78° F (26° C)

THERMOSTAT QUICK REFERENCE



A Note About Auto Changeover:

In Auto you have the ability to switch between Auto Heat or Auto Cool by pressing the System key. This can be done once the current mode has reached its setpoint. For example: If in Auto Heat, the heat setpoint must be satisfied before the thermostat will allow you to switch to Auto Cool. You can switch out of Auto by holding down the System key. To get back into Auto, you must toggle the System key to Auto.



A Note About Programmable Fan:

The programmable fan feature will run the fan continuously during any time period it is programmed to be on. This is the best way to keep the air circulated and to eliminate hot and cold spots in your building.

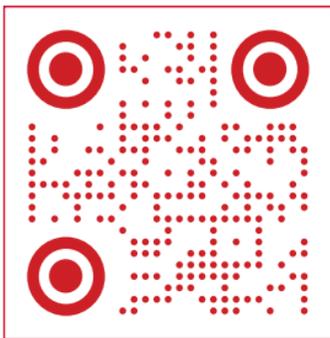


Reminders Note:

Once a Reminder has been turned on and set, the elapsed time can be checked by navigating to its Tech Setup step. The elapsed time will then appear in the text field. It can also be reset at that time by pressing and holding the third button from the left for 3 seconds. Resetting an expired Reminder can be done without entering Tech Setup, by a press and hold of the 3rd button from the left for 3 seconds.

SETTING UP WIFI CONNECTION AND APP

The Robertshaw RS10420T Programmable WiFi Thermostat works with the Robertshaw Thermostat App which is available for IOS and Android platforms. Users can download the App from the Apple store or Google Play.



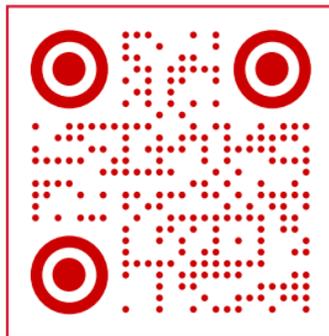
Use Phone to Scan for App
Installation Instructions







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6 Year
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