Robertshaw®

RS1042IT

Installation Manual

Thank you for purchasing a Robertshaw® thermostat. This manual will describe how to install and test the Robertshaw RS10421T thermostat.

This WiFi digital programmable thermostat allows you to control the temperature anytime and anywhere. It features a large backlit display and LCD touchscreen for ease of programming.

Compatible with any iOS or Android smartphone.

Thermostat System Types

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

INSTALLATION MANUAL

Important Safety Information Warning

- Always turn off the 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 an 18-30V 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.

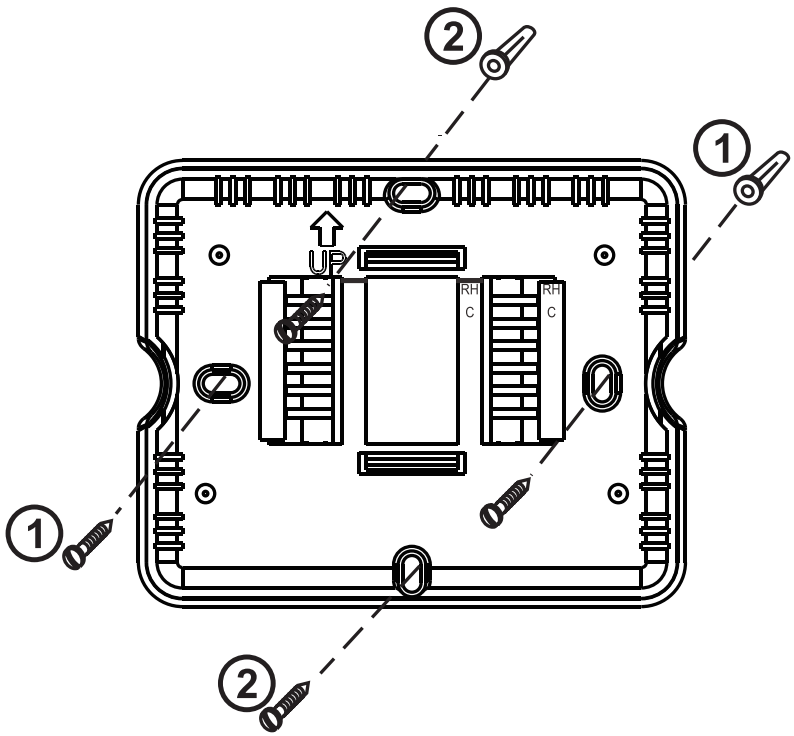
Table of Contents

SPECIFICATIONS	
Display Range	32°F to 99°F (0°C to 40°C)
Control Range	41°F to 90°F (5°C to 32°C)
Load Rating	1 amp per Terminal, 1.5 amp Maximum all Terminals Combined
Differential	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	4.7"W x 4.4"H x 1"D
Operating Frequency	433.92MJz

INSTALLATION

Back Plate Installation

① Horizontal Mount
② Vertical Mount



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

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

Caution: Electrical Hazard

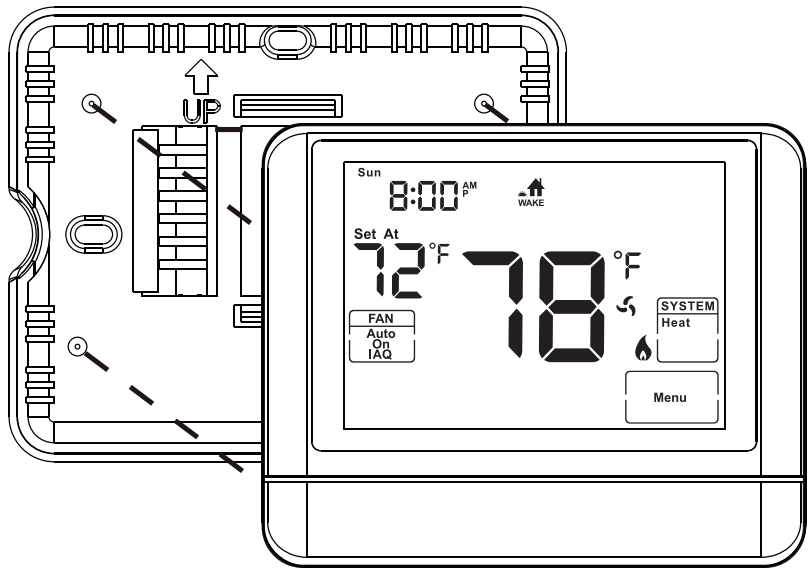
Disconnect power before installing this product. Failure to do so can cause electric shock or equipment damage.

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.

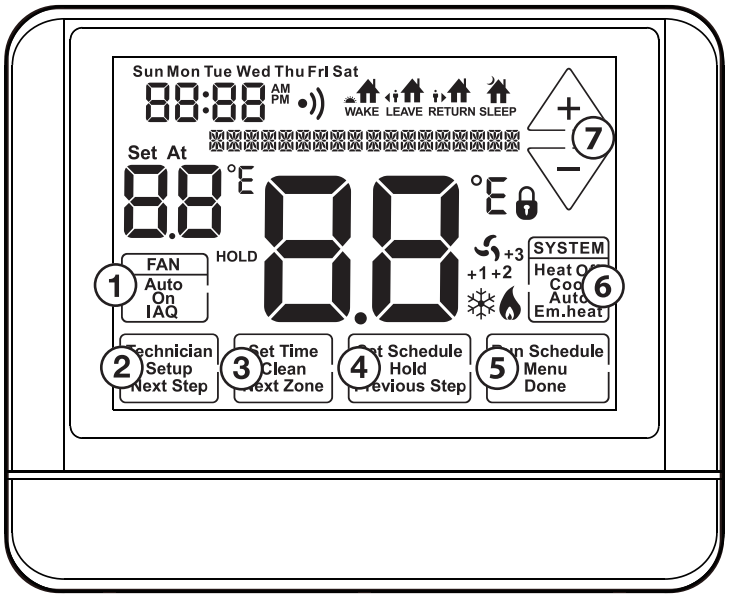
Mounting Thermostat

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



THERMOSTAT QUICK REFERENCE

Getting to know your thermostat (RS10421T)



1 Fan Buttons

2 Next Step Buttons

3 Set Time Buttons

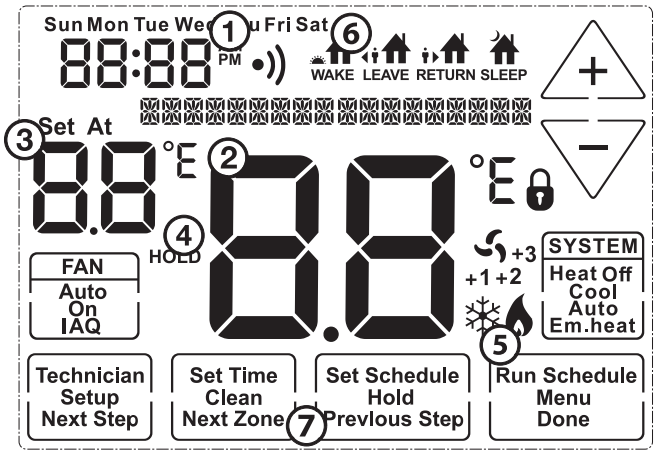
4 Program Buttons

5 Menu Buttons

6 System Buttons

7 Setpoint Buttons

Getting to know your thermostat (RS10421T)



1 Days of the week and time.

2 Indicates the current room temperature.

3 Displays the user selected setpoint temperature.

4 Hold is displayed when thermostat program is overridden.

5 System Operation Indicators: If these icons are flashing, there is a 5-minute delay for compressor protection.

6 Programmable Time Periods: Residential uses 4 time periods - **WAKE, RETURN, LEAVE and SLEEP**.

7 Program Menu Options: Displays different options during programming.

WIRING

Caution: Electrical Hazard

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

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 re-tighten the terminal block screws.
3. Do not over-tighten terminal screws! Maximum torque is 6 in-lbs. Over-tightening terminal block screws can damage the terminal block. A damaged terminal block may prevent the thermostat from fitting on the faceplate and could cause system operation issues.
4. Place nonflammable insulation into the wall opening to prevent drafts.

Terminal Designations

The following terminals on the thermostat back plate are wired according to the type of HVAC system connected to and how the thermostat is configured.

Terminal	2 Heat 2 Cool Conventional System	2 Heat 1 Cool Heat Pump System	3 Heat 2 Cool Heat Pump System
R	Transformer Power (cooling/heating)	Transformer Power (cooling/heating)	Transformer Power (cooling/heating)
C	Transformer Common	Transformer Common	Transformer Common
O/B	Reversing Valve/ Configurable Terminal	Reversing Valve/ Configurable Terminal	Reversing Valve/ Configurable Terminal
G	Fan Relay	Fan Relay	Fan Relay
W/E	First Stage of Heat	Emergency Heat	First Stage of Auxiliary Heat
Y	First Stage of Cool	First Stage of Heat & Cool	First Stage of Heat & Cool
Y2	Second Stage of Cool	N/A	Second Stage of Heat & Cool
W2	Second Stage of Heat	Auxiliary Heat	Second Stage of Auxiliary Heat
H	Humidify	Humidify	Humidify
D	Dehumidify	Dehumidify	Dehumidify

Installation Note:

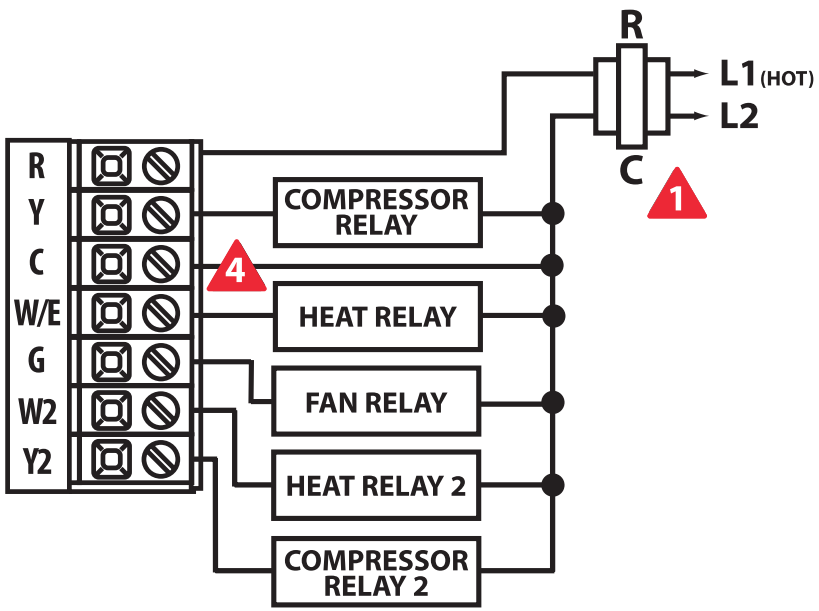
Devices such as a float switch that mechanically break circuits should be installed so that they break the control wire (Y) not the power (R). Interrupting the power circuit will shut off power to the thermostat completely and not allow it to operate.

Wire Specifications Tip

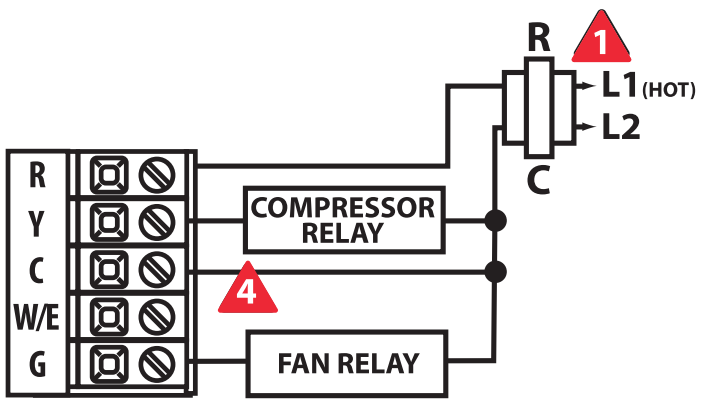
Use 18- to 22-gauge thermostat wire.
Shielded wire is not required.

1. Power supply
2. Humidifier connection port
3. Thermostat must be set to O and B to match the changeover valve. O is the cool changeover valve. B is the heat changeover valve.
4. The Auxiliary Heat Relay is energized as the second stage of heat.
5. Dehumidifier connection port

Typical 2H/2C System: 1 Transformer



Typical Cool-Only System with Fan

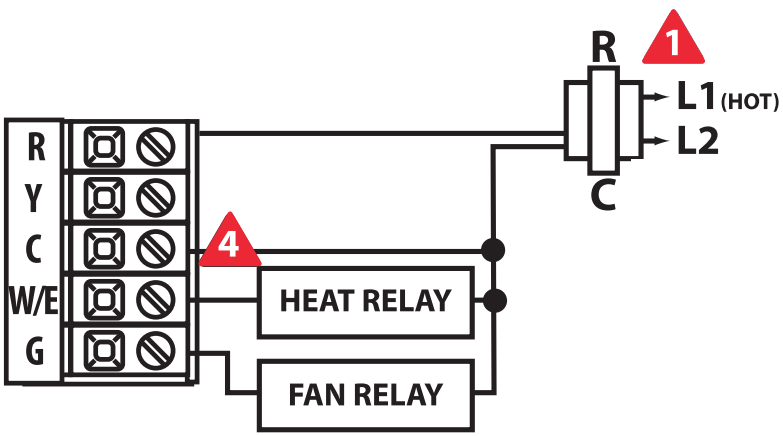


WIRING DIAGRAMS

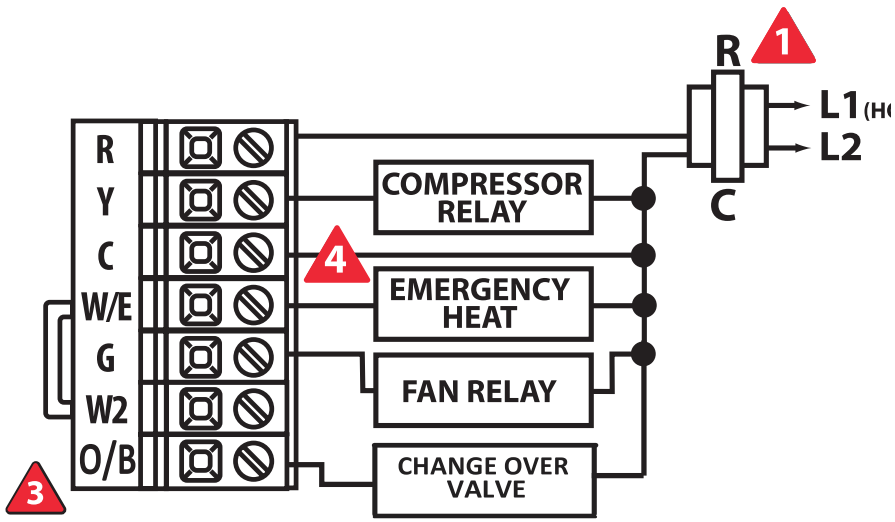
Note

In many heat pump systems without an emergency heat relay, a jumper can be installed between E and W2 to turn the thermostat into a single stage control for Emergency Heat Operation.

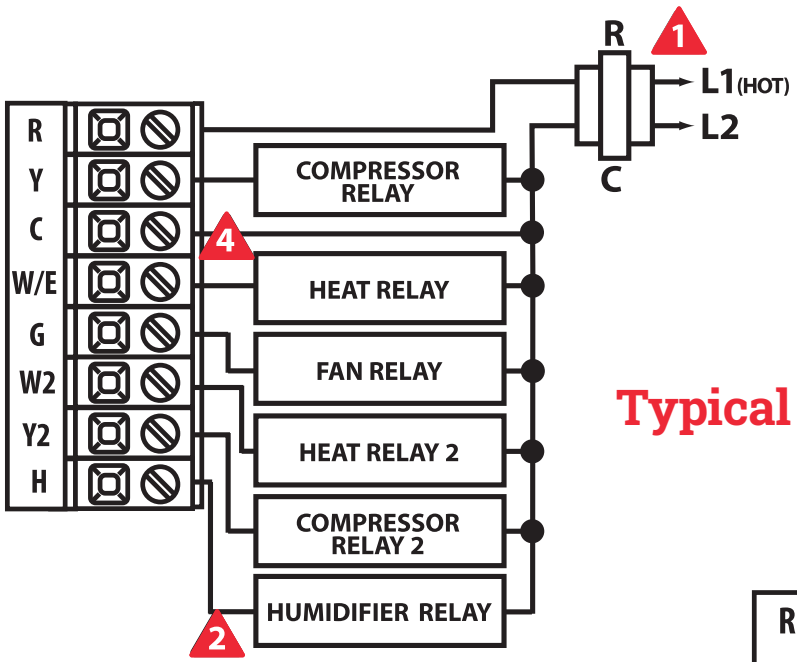
Typical Heat Only System with Fan



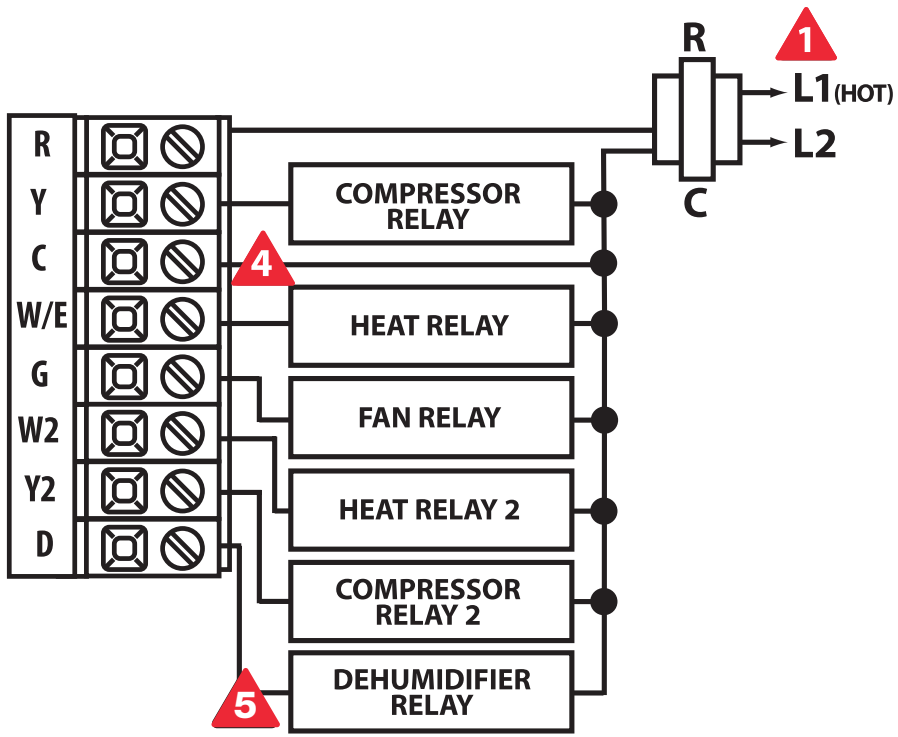
Typical 2H/1C Heat Pump System



Typical 3H/2C with 24 VAC Humidifier



Typical 2H/2C System with Dehumidify Terminal



TECHNICIAN SETUP

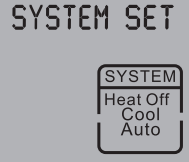
1. Press **MENU** button.
2. Press and hold **TECHNICIAN SETUP** for 3 seconds. The 3 second delay is designed so that homeowners do not accidentally access the installer settings.
3. Configure the installer options as desired using the table below.
4. Use (+) or (−) keys to change settings and the **NEW 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		
Pair	Release transmitter and receiver pair code.	RF PAIR	Press and hold Fan for 3 seconds until **LE** is flashed.	
Filter Change Reminder	This setting will flash a reminder in the display after the elapsed runtime to remind the user to change the filter. The **OFF** setting will disable this feature.	FILTER OFF 5E	The filter change reminder can be adjusted from **OFF** to 2000 hours in 50-hour increments.	OFF
Room Temperature Calibration	This setting allows the installer to change the calibration of the room temperature display so that, for example, the thermostat would read 72° instead of 70°.	CALIBRATE 0°F	The room temperature display can be adjusted to read up to 4° above or below the factory calibrated temperature.	0

Tech Setup Steps		LCD Will Show	Adjustment Options	Default
Minimum Compressor On-Time	The installer can select the minimum runtime for the compressor to help protect the compressor from short-cycling.		The minimum compressor runtime 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).	OFF
Compressor Short Cycle Delay	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.		The compressor short cycle delay setting can be removed by selecting OFF.	ON
Cooling Swing	The cooling swing 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 swing.		The cooling swing setting is adjustable from 0.2°F to 2°F.	0.5

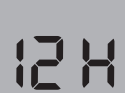
TECHNICIAN SETUP

Tech Setup Steps		LCD Will Show	Adjustment Options	Default
Heating Swing	The heating swing is factory preset at 0.4°. This means that whenever the room temperature cools by 0.4° full degree from the temperature setting, the heating system will turn on. If the heating system turns on too often, increase the temperature swing.		The heating swing setting is adjustable from 0.2°F to 2°F.	0.4
Heat Pump	When selected, the thermostat will operate as a heat pump.		**OFF** configures the thermostat for conventional systems. **ON** configures the thermostat for heat pump systems.	OFF
System Set	The thermostat can be configured to operate up to a 2H/2C conventional heat pump system or a 4H/2C conventional heat pump system. This feature is only shown if **HEAT PUMP** is **ON**.		Use + or − buttons until the desired application is flashing. **AUTO** = (Auto Changeover)	OFF

Tech Setup Steps		LCD Will Show	Adjustment Options	Default
Stages of Heat + Cool	The thermostat can be configured to operate up to a 2H/2C conventional heat pump system or a 4H/2C conventional heat pump system. This feature is only shown if **HEAT PUMP** is **ON**.		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.	2 Stages
Dual Fuel	When the **HEAT PUMP** is **ON** (when the oil and gas dual-purpose system is enabled) and the RS9055OUT induction temperature is greater than the Dual Fuel setting temperature, electric heating will be utilized. When the RS9055OUT induction temperature is less than the Dual Fuel setting temperature, oil will be utilized.		The Dual Fuel setting can be adjusted between 30°F to 70°F. Use + or − to select the temperature point for automatic switching between oil and electric.	32°F
Cooling Fan Delay	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.		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.	OFF

TECHNICIAN SETUP

Tech Setup Steps		LCD Will Show	Adjustment Options	Default
Program Options	The thermostat can be configured to have a 7 day program or be non-programmable.		Use + or − to select **7d** or 7 day, or **Od** for non-programmable.	7d
Heating Temperature Setpoint Limit	This feature allows you to set a maximum heat setpoint value. The setpoint temperature cannot be raised above this value.		Use the + or − key to select the maximum heat setpoint. Range 41°F - 90°F	90°
Cooling Temperature Setpoint Limit	This setting allows the installer to set a minimum cool setpoint value. The setpoint temperature cannot be lowered below this value.		Use the + or − key to select the minimum cool setpoint. Range 41°F - 90°F	41°
F° or C°	Select F for Fahrenheit temperature display or select C for Celsius display.		**°F** for Fahrenheit **°C** for Celsius	°F

Tech Setup Steps		LCD Will Show	Adjustment Options	Default
12- or 24-Hour Clock	Select a 12- or 24-hour clock setting.		Use the + or − key to select 12- or 24-hour clock.	12-Hour Clock
Fan Operation	Select **GAS** or **ELECT** depending on the type of furnace.		Gas or Elec	GAS
Morning Recovery	This setting will start heating early to bring the temperature to its programmed setpoint by the beginning of the **WAKE** period.		Use the + or − key to turn on or off.	ON
Display Light	The display light can be configured to come on only when the light key or any other key is selected, or to stay on **ALL** of the time.		**AUTO** - Any key ON **ON** - Always ON	AUTO
Contractor Call Number	Allows you to input your phone number in the display. Selecting **ON** will enable this feature. **OFF** will disable this feature.		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.	OFF

TECHNICIAN SETUP

Tech Setup Steps		LCD Will Show	Adjustment Options	Default
IAQ Mode Cycle	This setting will configure the fan to run a selected number of cycles per hour. Note: This mode can be enabled or disabled at any time during normal operation by selecting **IAQ** mode with the fan key. Turning this feature on shows **IAQ** option in fan key. This programmable mode will operate the fan 1-4 cycles per hour, 1-45 minutes per cycle. Once programmed in Technician Setup select **IAQ** with the fan key to enable this mode. Disable this mode by selecting **ON** or **AUTO** with the fan key.		Select OFF, 1, 2, 3 or 4 with the + or − buttons. This sets the number of cycles per hour that the **IAQ** fan mode will operate.	OFF
IAQ Minutes Per Cycle	This setting allows for the selection of the minimum number of minutes that the fan will run for each **IAQ** Mode cycle.		Select 1, 5, 10, 15, 20, 30 or 45 minutes. When **IAQ** fan mode is enabled, the thermostat will ensure the fan runs at least the selected number of minutes per for each **IAQ** Mode Cycle.	1

Tech Setup Steps		LCD Will Show	Adjustment Options	Default
Beep	An audible noise will sound when any key is depressed unless this setting is in **OFF** mode.		If **ON** is selected, the noise will sound. If **OFF** is selected there will be no sound.	ON
Humidify	This setting adds humidity when the system is in **HEAT** mode.		Use + or − to turn on or off. If **ON** is selected, the humidity will be displayed on the main screen and the **HUM** terminal will energize when the humidity setpoint is above the ambient humidity in **HEAT** mode.	OFF
Dehumidify	This setting removes humidity when the system is in **COOL** mode.		Use + or − to turn on or off. If **ON** is selected, the humidity will be displayed on the main screen and the **DHM** terminal will energize when the humidity setpoint is below the ambient humidity in **COOL** mode.	OFF
Humidity Calibration (Only shows if Humidify or Dehumidify is set to ON.)	This setting allows the installer to change the calibration of the ambient humidity displayed.		Use the left and right arrows to adjust the calibration +/-3. Each one unit of adjustment amounts to approximately 5%.	0

TECHNICIAN SETUP

Tech Setup Steps		LCD Will Show	Adjustment Options	Default
HUM Terminal (Only shows if humidify is set to ON)	See the chart below for **HUM** Terminal options		Use the left and right arrows to select the **HUM** terminal option. See the chart below for an explanation of these options.	1
DHM Terminal (Only shows if dehumidify is set to ON)	See the chart below for **DHM** Terminal options		Use the left and right arrows to select the **DHM** terminal option. See the chart below for an explanation of these options.	1

HUM Terminal

Options	HUM Terminal Energizes When the Ambient Humidity Is...
1	Below the Humidity Setpoint and Heat or Fan is Energized
2	Below the Humidity Setpoint and Heat is Energized
3	Below the Humidity Setpoint. It Will Also Energize the Fan if Humidity is Selected.
4	Below the Humidity Setpoint

OPTIONS	DHM Terminal Energizes When the Ambient Humidity Is...
1	Above the Humidity Setpoint and Cool or Fan is Energized
2	Above the Humidity Setpoint. It Will Also Energize the Fan if Dehumidify is Selected.
3	Above the Humidity Setpoint
4	Above the Humidity Setpoint and the Compressor is Not Running

Tech Setup Steps		LCD Will Show	Adjustment Options	Default
Humidity Pad Reminder	Enables a reminder for the user to change the humidity pad.		Use the + or − key to select OFF, 600, 1000, 1500 or 2000. These represent hours of heat operation.	OFF
MAC ID	This setting displays the **MAC** address of WiFi module.			
Firmware Version	This setting displays the version of firmware that is installed in the thermostat.		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 WIFl settings to factory default.		Press **YES** to reset.	

Differential Setting Tip

The second stage will turn on at 2x the differential setting and turn off at 1x the differential setting. For example, if the differential is 0.5°F for heating and the thermostat is set at 70°F, the first stage will turn on at approximately 69.5°F and turn off at approximately 70.5°F. The second stage will turn on at 69°F and turn off at approximately 69.5°F.

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** button for 3 seconds.

Set Time of Day and Day of Week

1. Press the **MENU** button.
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**.
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**.
7. The minutes will be flashing. Use + or − to select the current minutes.
8. Press **DONE** when completed.

PROGRAMMING

1. Select **HEAT** or **COOL**.
   Note: Heat and cool need to be programmed separately.
2. Press **MENU**.
3. Press **SET SCHED**.
   Note: Monday will be displayed and the **WAKE** icon will be shown.
4. Time will be flashing. Use + or − to make your time selection for that day's **WAKE** time period.
5. Press **NEXT**.
6. The setpoint temperature will be flashing. Use + or − to make your setpoint selection for that day's **WAKE** time period.
7. Press **NEXT**.
8. Repeat steps 4 through 7 for that day's **LEAVE** time period, **RETURN** time period, and **SLEEP** time period.
9. Repeat steps 4 through 8 for the remaining days of the week.

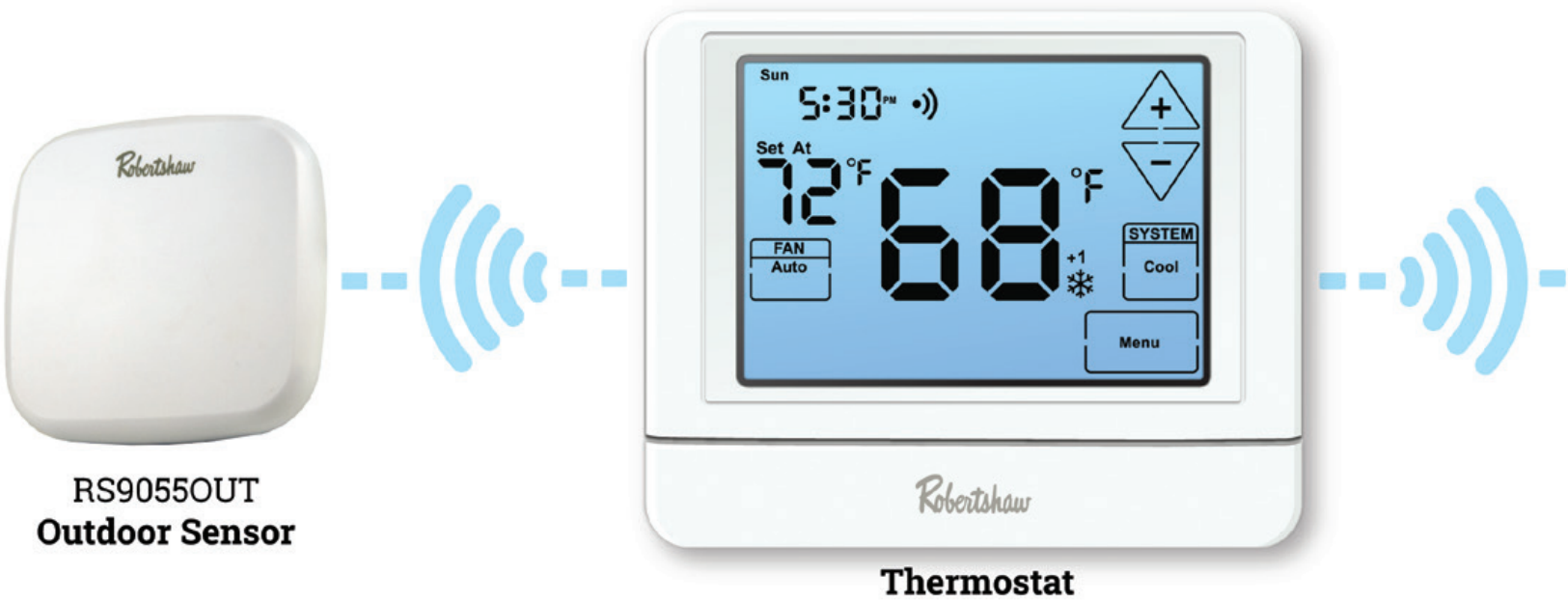
   Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday
   Repeat steps 4 thru 7 for the remaining days of the week.

Factory Default Program

Robertshaw® RS10421T thermostats are shipped with an energy saving default program. The thermostat can be programmed to have all the weekdays the same, the same setpoints for all weekdays or a separate program for Saturday and a separate program for Sunday. There are four time periods for each program (**WAKE, LEAVE, RETURN, SLEEP**).

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	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)
SUNDAY	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)

Outdoor Sensor



RS9055OUT
Outdoor Sensor

Thermostat

The RS9055OUT is an optional wireless outdoor remote temperature sensor and can be used for dual fuel balance point applications.

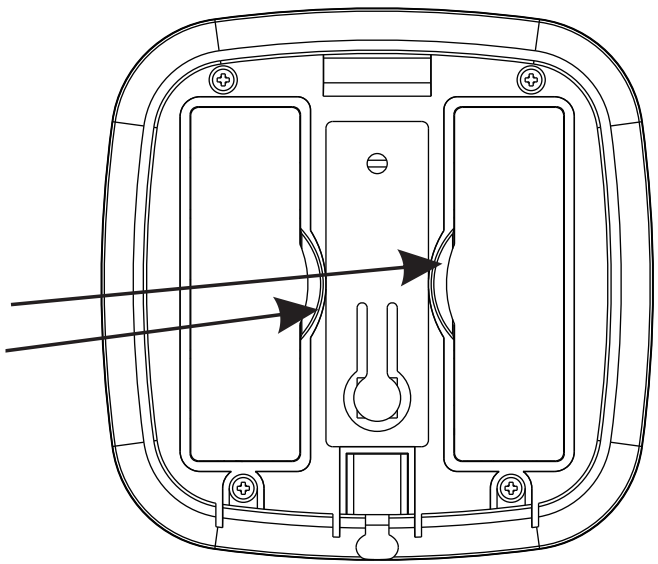
- Durable weatherproof design
- Compatible with RS9423T or RS10421T thermostat
- Wireless range from sensor to thermostat is 328 feet (100m)
- Battery powered

OPTIONAL ACCESSORY - RS9055OUT

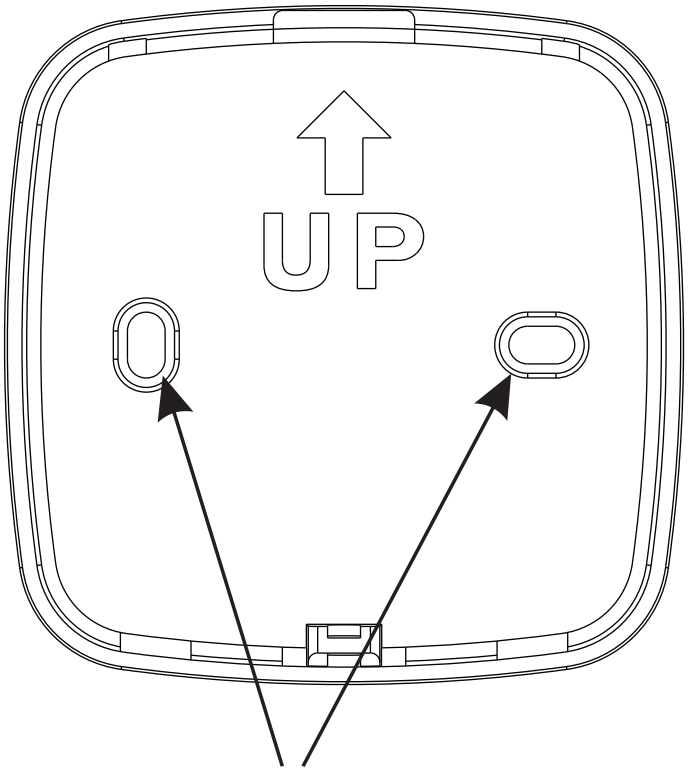
Mounting & Battery Installation

Detach the rear panel of the remote from the front panel by loosening the screws at the bottom of the cover as shown in the figure.

Use a screwdriver to open the battery cover from the arrow position.



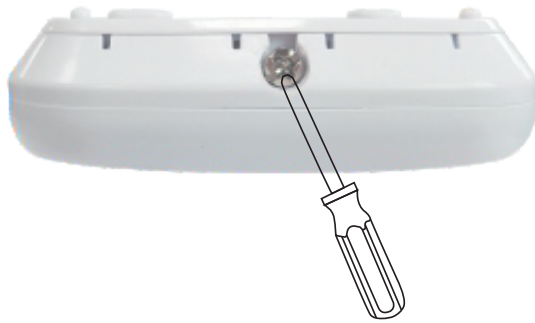
Mounting & Battery Installation



Horizontal Mount

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

1. Position the rear panel with the insert at the top of the remote and then snap toward the bottom.



2. Tighten the screws with a screwdriver.

OPTIONAL ACCESSORY - RS9055OUT

Getting to Know Your Remote Temperature Sensor

The temperature of RS9055OUT is displayed in the upper left corner of RS10421T (**OUTDOOR** shows alternately with time).

When **HEAT PUMP** is selected to **ON** (when the oil and gas dual-purpose system is enabled) and the RS9055OUT induction temperature is greater than the **DUAL FUEL** setting temperature, electric heating will be utilized. When the induction temperature is less than the **DUAL FUEL** setting temperature, oil will be utilized.

Install two AA Alkaline batteries. Be sure to match positive (+) ends of batteries with positive (+) battery terminals in the battery compartment.

SENSOR BATT LOW is displayed at **LOW** voltage.

Learning code red indicator

Learning Code Button
Press **CONNECT** button for 3 seconds to enter code learning configuration mode (red light flashes quickly).

Radio Frequency Pairing

1. Press **MENU** button on RS10421T thermostat.
2. Press and hold **TECHNICIAN SETUP** button for 3 seconds.
3. Press **FAN** button to start **RF PAIR** (enter the learning code pairing mode).
4. Press and hold **CONNECT** button on RS9055OUT remote temperature sensor (red light flashing)
5. The message **SUCCESS** will be displayed on your thermostat screen.

SETTING UP WIFI CONNECTION AND APP

The Robertshaw RS10421T 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

English

"This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) this device may not cause interference, and

(2) this device must accept any interference, including interference that may cause undesired operation of the device."

French

"Le present appareil est conforme aux CNR d'lndustrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisee aux deux conditions suivantes:

(1) l'appareil ne doit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioelectrique subi, meme si le brouillage est susceptible d'en compromettre le fonction nement."

FCC STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna. Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

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