RS9423T

Installation Manual

INSTALLATION MANUAL

Thank you for purchasing a Robertshaw® thermostat. This manual will describe how to install and test the Robertshaw RS9423T thermostat.

Thermostat System Types

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

Table of Contents

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Power Options

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

Important Safety 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 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.

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 - 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	4.7"W x 3.8"H x 1"D
Operating Frequency	433.92MJz

INSTALLATION

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

For new installations, mount the 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 the thermostat operation.

Wallplate Installation

① Horizontal Mount
② Vertical Mount
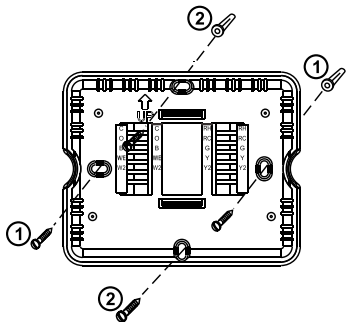
For a vertical mount, put screws on the top and bottom.

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.

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.
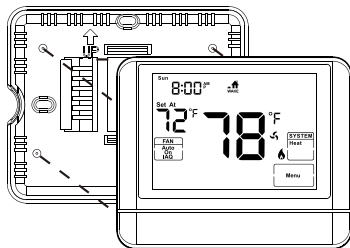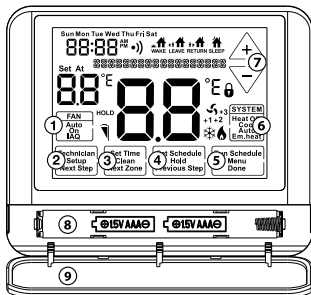

Battery Installation
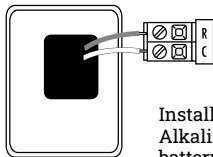
Battery installation is optional if used with 24VAC power (R and C terminal is connected).

Install two AAA Alkaline batteries into battery compartment. Be sure to match positive (+) ends of batteries with positive (+) battery terminals in the battery compartment.
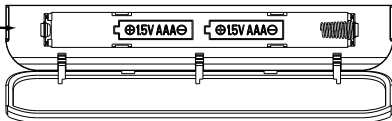
Getting to Know Your Thermostat (RS9423T)

1 Fan Buttons

2 Next Step Buttons

3 Set Time Buttons

4 Program Buttons

5 Menu Buttons

6 System Buttons

7 Setpoint Buttons

8 Battery Cover

9 Button/Battery Access

Getting to Know Your Thermostat (RS9423T)
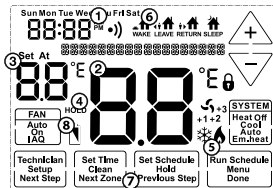
1 Days of the week and time

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

8 Low Battery Indicator:
Replace batteries when this indicator is shown

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

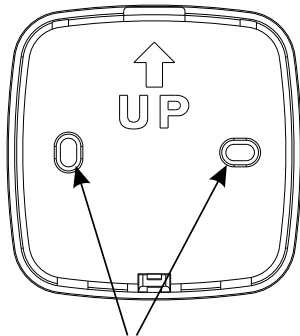# RS9055OUT OPTIONAL REMOTE SENSOR

Mounting & Battery Installation

Detach the rear panel of the remote sensor 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.

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

Tighten the screws with a screwdriver.

Getting to Know Your Remote Temperature Sensor

The temperature of RS9055OUT Remote Sensor is displayed in the upper left corner of RS9423T (OUTDOOR shows alternately with time).

When **HEAT PUMP** is selected to **ON** (when the oil and gas dual-purpose system is enabled), When the RS9055OUT Remote Sensor induction temperature is greater than the **DUAL FUEL** setting temperature, it will automatically use electric heating. When the induction temperature is less than the **DUAL FUEL** setting temperature, the fuel is automatically heated.

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

SENSOR BATT LOW is displayed on RS9423T 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)

⚠ **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.

Wiring Tips

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

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

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 E and W2 to turn the thermostat into a single stage control for emergency heat.

Heat Pump Configuration
The thermostat can be optionally configured to operate a heat pump. See **Heat Pump** configuration on page 21 of this manual for configuration instructions.

Terminal	2 Heat 2 Cool Conventional System	2 Heat 1 Cool Heat Pump System	3 Heat 2 Cool Heat Pump System
RC	Transformer Power (cooling)	Transformer Power (cooling)	Transformer Power (cooling)
RH	Transformer Power (heating)	Transformer Power (heating)	Transformer Power (heating)
C	Transformer Common	Transformer Common	Transformer Common
B	Reversing Valve/ Configurable Terminal	Reversing Valve/ Configurable Terminal	Reversing Valve/ Configurable Terminal
O	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

WIRING DIAGRAMS

1 Power supply

2 In a single-transformer system, leave the metal jumper in place between RH and RC. Remove the jumper in two-transformer systems.

Typical 2H/2C System: 1 Transformer
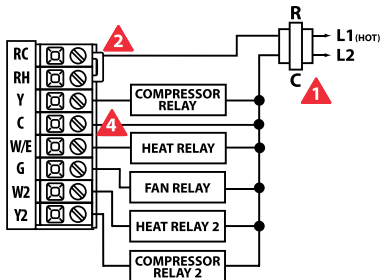
Typical Cool-Only System with Fan
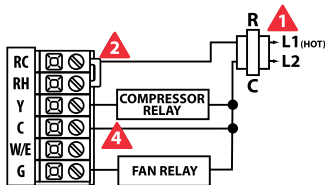
Typical Heat Only System With Fan
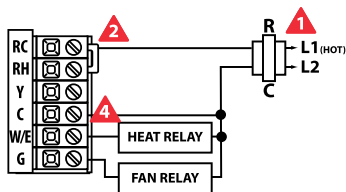
Note

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.

⚠️ 3 Use either O or B terminals for reversing valve.

⚠️ 4 Option 24V AC common connection when the thermostat is powered by batteries.

WIRING DIAGRAMS

Typical 2H/2C System: 2 Transformer
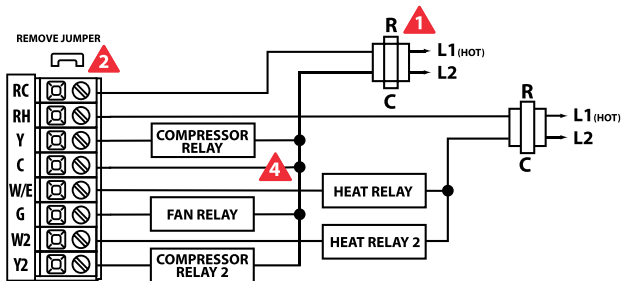
Typical 3H/2C or 2H/1C Heat Pump System
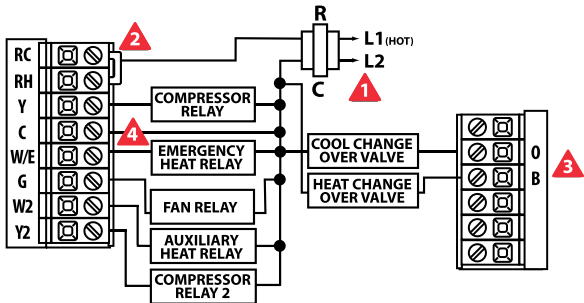
TECHNICIAN SETUP

1. Press **MENU** button.
2. Press and hold **TECHNICIAN SETUP** button for 3 seconds. This 3 second delay is designed so that homeowners do not accidentally access the installer settings.
3. Configure the installer settings as desired using the table below.
4. Use the ⊕ 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
Pair	Then release transmitter and receiver pair code.	REPAIR	Press **FAN** to enter the code learning configuration mode, and then press RS9055OUT's **CONNECT** button for 3 seconds to enter the code learning configuration mode (red light flashing). When the code learning succeeds, **SUCCESS** will be displayed and exit, and the red light of RS9055OUT will stop flashing.	
Filter Change Reminder	This setting will flash a reminder in the display after the elapsed run time 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.	MIN COMP OF	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.	COMP DELAY ON	The compressor short cycle delay setting can be removed by selecting **OFF**.	ON
Cooling Differential	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.	COOL SWING 0.5°F	The cooling differential setting is adjustable from 0.2°F to 2°F.	0.5

TECHNICIAN SETUP

Tech Setup Steps		LCD Will Show	Adjustment Options	Default
Heating Differential	The heating differential 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 differential.	HEAT SWING 0.4°F	The heating differential setting is adjustable from 0.2°F to 2°F.	0.4
Heat Pump	When selected, the thermostat will operate as a heat pump.	HEAT PUMP OF	**OFF** configures the thermostat for conventional systems. **ON** configures the thermostat for heat pump systems.	OFF
System Set	The thermostat can be configured for its specific application: **HEAT OFF – COOL ON; HEAT OFF – COOL OFF; HEAT OFF – COOL AUTO.** Note: Emergency Heat is available in Heat Pump mode only.	SYSTEM SET SYSTEM Heat Off Cool Auto	Use the ⊕ or ⊖ buttons until the desired application is flashing. **AUTO**=(Auto Changeover)	OFF

Tech Setup Steps		LCD Will Show	Adjustment Options	Default
Stages of Heat and 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**.	2H2C STAGS OF HEAT+COOL	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 Remote Sensor induction temperature is greater than the Dual Fuel setting temperature, electric heating will be utilized. When the RS9055OUT Remote Sensor induction temperature is less than the Dual Fuel setting temperature, oil will be utilized	DUAL FUEL 32°F	The Dual Fuel setting can be adjusted between 30°F to 70°F. Use the $+$ or $-$ button to select the temperature point for automatic switching between oil and electricity.	32°F

TECHNICIAN SETUP

Tech Setup Steps		LCD Will Show	Adjustment Options	Default
Cooling Fan Delay	This setting delays the fan from coming on in cool mode and keep keeps it running after the compressor shuts off for a short time to save energy in some systems.	COOL FAN DELAY **OF**	The cooling fan delay setting can be set to **OFF**, 15, 30, 60 or 90 seconds. If 15, 30, 60 or 90 seconds 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
Heating Temperature Setpoint Limit	This setting allows the installer to set a maximum heat setpoint value. The setpoint temperature cannot be raised above this value.	HEAT LIMIT **90**°F	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 value temperature cannot be below this value.	COOL LIMIT **41**°F	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 F OR C SET **83**°F	**°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.	12 H 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 FAN OPERATION	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.	MORNING RECOVERY ON	Use the ⊕ or ⊖ key to turn on or off.	ON
Program Options	This thermostat can be configured to have 7 Day, 5+1+1 programmed or be non-programmable. If 7 Day is selected, in Set Time all seven days will need to be programmed individually. 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. If **0d** is selected, the thermostat becomes non-programmable.	PROGRAM OPTIONS 5d	Use the ⊕ or ⊖ key to select 7d for 7 day, 5d for 5+1+1, or **Od** for non-programmable.	5d

TECHNICIAN SETUP

Tech Setup Steps		LCD Will Show	Adjustment Options	Default
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 dL	**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.	PHONE NUM 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 27 for operation.	OFF
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 anytime during normal operation by selecting **IAQ** mode with the fan key. Turning this feature on shows IAQ option in fan key. Notes: 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.	OF IAQ MODE CYCL	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

Tech Setup Steps		LCD Will Show	Adjustment Options	Default
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.	1 AQ MODE MIN	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 for each **IAQ** Mode Cycle.	1
Beep	An audible noise will sound when any key is depressed unless this setting is in **OFF** mode.	BEEP OF	If **ON** is selected, the noise will sound. If **OFF** is selected, there will be no sound.	ON
Factory Default Reset	This step resets all WiFi settings to factory default.	RESET TO DEFAULT NO	Press **YES** to reset.	

TECHNICIAN SETUP

<div style="border: 1px solid red; padding: 10px;">

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. If the third stage is used, it will turn on at 68.5°F and turn off at approximately 69°F.

</div>

Keypad Lockout

The function of activating your lockout choice takes place after you have exited **Technician Setup**. After **Technician Setup** is completed, the settings can be locked out (or unlocked) by holding down the **MENU** button for 3 seconds.

Contractor Call Number Note

The Contractor Call Number setting is **ON**, your 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 Week

1. Press the **MENU** button.
2. Press **SET TIME**.
3. Day of the week will be flashing. Use the ⊕ 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 current minutes.
8. Press **DONE** when completed.

PROGRAMMING

Set Program Schedule

Follow these steps to customize your 5+1+1 or 7-day program schedule:

Weekday

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 $\oplus$ or $\ominus$ to make your time selection for the **WAKE** time period for Monday-Friday (or Monday if in 7 Day mode).
5. Press **NEXT**.
6. The setpoint temperature will be flashing. Use $\oplus$ or $\ominus$ to make your setpoint selection for the **WAKE** time period for Monday-Friday (or Monday if in 7 Day mode).
7. Press **NEXT**.
8. Repeat steps 4 through 7 for the weekday **LEAVE** time period, for the weekday **RETURN** time period, and for the weekday **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.
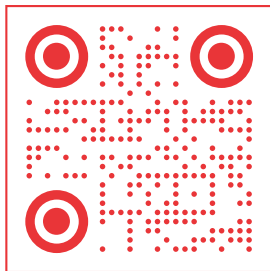
Robertshaw® RS9423T thermostats are shipped with an energy saving default program. The thermostat can be programmed to have all the weekdays the same, the same setpoints for all weekdays or a separate program for Saturday and a separate program for Sunday. There are four time periods for each program (**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)

Robertshaw

6 Year Limited Warranty

Use Phone to Scan for Warranty Info