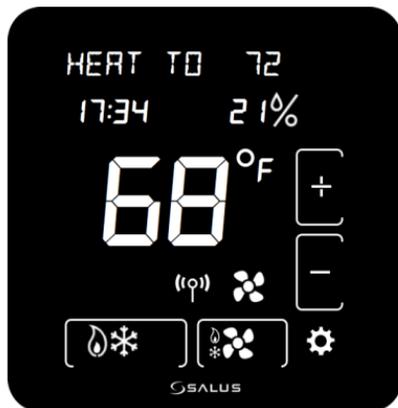




# Optima S & Optima SR Thermostat



## User Guide

For other language versions, please visit: [www.salusinc.com](http://www.salusinc.com)

## SAFETY INSTRUCTIONS

Please read these instructions carefully **before installing and using** the Optima S Thermostat. This manual is meant to be used as a reference guide for the installation, configuration and maintenance of your device.

- Follow all local and electricity supplier regulations regarding the installation or replacement of a thermostat. An authorized, qualified installer may be required.
- **Do not connect any of the terminals to the 110/220 VAC supply.** The Optima S Thermostat uses two AA batteries or a 24 VAC power source.
- **Do not** cover any of the vents on the thermostat.
- **Do not** install this unit at an altitude of over 2000 meters.
- **Do not** place the unit in a bathroom or area of excessive moisture.
- **Do not** allow the unit to get wet. This device serves as a temperature control system only in dry, closed living and office spaces.
- **Do not** expose the unit to temperatures below 5°C or above 40°C, humidity above 80%, or pollution above level 2.
- **Do not** expose the unit to voltage fluctuations more than +/- 10%.
- **Do not** use solvents or aggressive cleaning agents. A dry, soft cloth is recommended.

The manufacturer does not accept responsibility for any damage caused by not following these instructions.

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## INTRODUCTION

The Optima S is available in 2 configurations: Standard and Router to the network.

Model	Description
<b>ST898ZB</b>	This model functions as a standard 'End Device' and may be powered by 24VAC or battery.
<b>SA898ZBR</b>	This model functions as a Router to the network and will route messages between devices on the network. Because of the higher level of communications this model must be powered by 24VAC with a C-wire to avoid draining the batteries.

## INSTALLING THE THERMOSTAT

There are five basic steps to installing the thermostat:

1. Turn off power to the HVAC system.
2. Determine the wiring configuration.
3. Install new thermostat, removing old thermostat and mounting the Wall Plate if required.
4. Turn power back on to the HVAC system.
5. Configure the new thermostat.

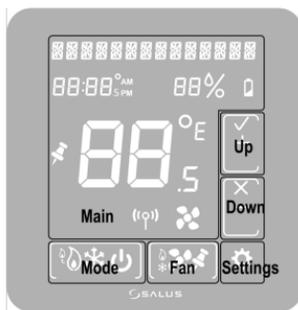
Please review the separate installation instructions and wiring diagrams in Appendix A at the end of this manual for installation details.

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## CONTROLS AND DISPLAY

### Buttons

There are six (6) button areas on the Optima S touchscreen display as shown on the right and defined below. The Reset button is a recessed button on the bottom side surface of the device, below the logo.

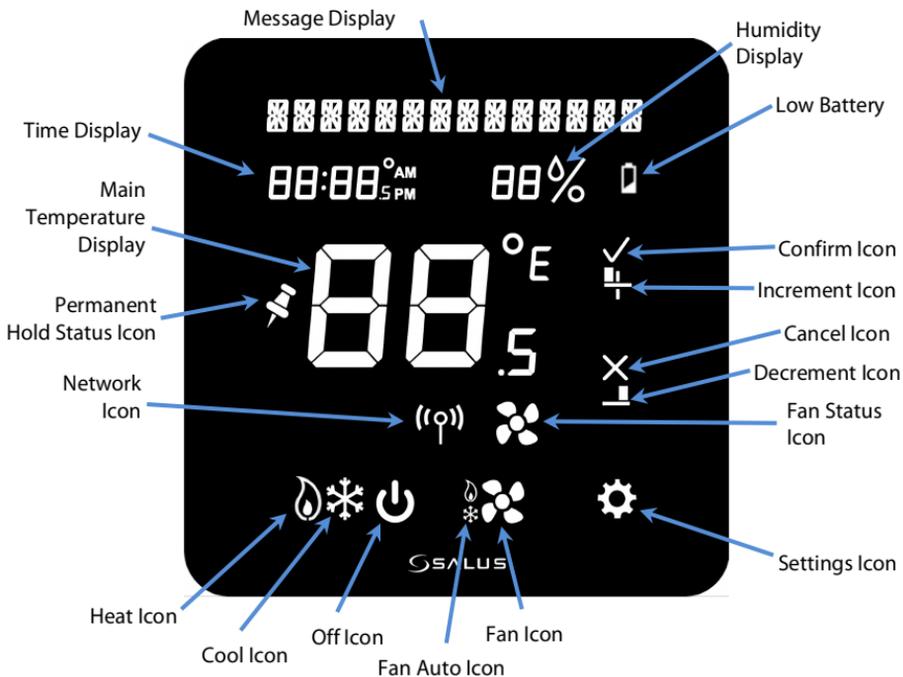


Reset

Button	Definition	Home Screen	Settings Screens
Main	Home Screen button	Not used	Returns display to Home Screen
Mode	Operating mode select (Heat, Cool, Auto or Off)	Change operating mode	Not used: mode icons are displayed if needed
Fan	Fan mode select (On or Auto)	Change Fan mode or set Permanent Hold	Not used
Settings	Device settings	Enter Settings screens	Move between Settings screens
Up	Increment or confirm changes	Increase Set Point	Increment options / Confirm
Down	Decrement or cancel changes	Decrease Set Point	Decrement options / Cancel
Reset	Restore device to Home screen		

## Indicators

The following indicators are available on the LCD display.



Indicator	Description
Message Display	Alphanumeric display of HVAC status and labels
Time Display	Displays time in 12- or 24-hour format if provided by the network
Main Temperature Display	Displays the room temperature or set point as required
Permanent Hold Status Icon	 Indicates whether Permanent Hold is active
Network Icon	 Indicates when the thermostat is connected to a smart home system
Mode Icons	HVAC operating modes as follows:  <b>Off</b> – System is OFF  <b>Auto</b> – Heat or Cool as required  <b>Cool</b> – AC or Cooling mode  <b>Heat</b> – Furnace or Heating mode
Fan Icons	Fan operating modes as follows:  <b>Auto</b> – Fan ON while heating or cooling  <b>On</b> – Fan always ON
Settings Icon	 Tap for device settings, tap again to step through menu
Decrement Icon	Set device settings
Cancel Icon	Select Down to decrement changes or reject changes
Increment Icon	Set device settings
Confirm Icon	Select Up to increment changes or confirm changes
Low Battery	Indicates when the 2 AA batteries need to be replaced
Humidity	Indicates the humidity level in your home

## INITIALIZATION

When power is applied to the Thermostat the display will cycle through an initialization sequence where it performs a display test and displays the firmware version.

If it was not previously associated with a network, it will display **JOINING...** **1 0** as it attempts to join a network.

The number will count down from **1 0** minutes to **0**.

When it either finds a network, times out, or pairing is canceled by the user, the thermostat will default to the setting **HVAC EQPT TYP**.

If there is no button activity for 30 seconds, the display will revert to the Home screen.

If the thermostat had previously joined a network, it will default to the Home screen.

Once initialization is complete, the Optima S is ready for use, or to be configured for the intended application. The Optima S may be configured manually through the keypad, or by using the SALUS Smart Home App. To use the desktop App go to <https://us.salusconnect.io/login>

To download the mobile App search for Salus Smart Home on the Apple App Store and Google Play



## CONFIGURING THE THERMOSTAT

There is an extensive list of configuration settings that can be accessed by tapping the Settings  button.

### Navigating the Settings Menu

To move forward and back through the Settings menu and make any changes to the settings, the buttons function as follows:

Touch Button	Type	Action
 Settings	--	Enter Settings menu, and Save and go to next parameter setup
+ or  / 	Short	Increment parameter value by 1
	Long	After long press time, increment by 1 at 4 Hz rate while key remains down
-	Short	Decrement parameter value by 1
	Long	If applicable, decrement value by 1. After long press time, decrement by 1 at 4 Hz rate while key remains down
 Back	--	Save and go to previous parameter setup

After 30 seconds of no user input, changes will be saved, and the device will return to Home screen.

### Settings

Press the  button to enter the Settings menu

- Pressing  will save the setting and advance to the next menu item
- Pressing  will save the setting and advance to the previous menu item

The thermostat defaults to a Heat Pump equipment type with configuration settings typical for that type of equipment.

Equipment Type allows you to select the equipment the Optima S will be controlling.

<b>EQPT TYP-</b>	<b>HP</b> <small>(default)</small>	For conventional Heat Pumps	<b>+</b> <b>or</b> <b>-</b>	Use the + or – buttons to step through the available options.
	<b>HP+EH</b>	For Heat Pumps with Emergency Heating		
	<b>HT/AC</b>	For forced air Heating and Cooling systems		
	<b>--/AC</b>	For Cooling only systems		
	<b>HT/--</b>	For Heating only systems		

If HP or HP+EH are selected, you must set the Reversing Valve operation

<b>REVERS VALVE-</b>	<b>0</b> <small>(default)</small>	Reversing valve for Heat switching to Cool	<b>+</b> <b>or</b> <b>-</b>	Use the + or – buttons to select 0 or B.
	<b>B</b>	Reversing valve for Cool switching to Heat		

If Heat + AC or Heat only are selected, you must set the Fan Control

<b>FAN ENTL-</b>	<b>FURNC</b> <small>(default)</small>	Used with Gas heating elements	<b>+</b> <b>or</b> <b>-</b>	Use the + or – buttons to FURNC or TSTAT.
	<b>TSTAT</b>	Used with Electric heating elements		

The Auxiliary Relay function is shown when either Heat Pump or AC only is selected. For all other HVAC types, the output is configured for heating.

<b>AUX FUNC-</b>	<b>NONE</b>	No function	<b>+</b> <b>or</b> <b>-</b>	Use the + or – buttons to step through the available options.
	<b>HMFY</b>	For control of a humidifier		
	<b>DMFY</b>	For control of a dehumidifier		
	<b>HEAT</b>	For 2 <sup>nd</sup> stage heating control (not for AC only)		

When the Equipment Type is Heat Pump or AC only, and the Auxiliary Relay function is set for Humidify, or Dehumidify, you must configure the relay operation.

<b>AUX RELAY -</b>	<b>CLS</b> (default)	Functions like a Normally Closed relay	+ or -	Use the + or – buttons to select Close or Open.
	<b>OPN</b>	Functions like a Normally Open relay		

The Optima S supports a remote temperature sensor for control if the thermostat is not located in the optimum location due to existing wiring. The remote sensor, SS909ZB, may be paired with the thermostat and the value will be displayed on the Optima S.

The Settings menu allows you to select the internal or external sensor for control.

<b>TEMP SEL - INT</b> (default)	Select Internal (INT) or remote (RMT) temperature sensor <sup>1</sup>	Use the + or – buttons to step through the available options.
<b>TEMP SEL - RMT</b> (Zigbee)		

<sup>1</sup> See Pairing Remote Temperature Sensor on page []

The displayed value for the temperature internal and external (if selected) sensor may be adjusted to increase or decrease the value. The thermostat will control to this value.

<b>INT TEMP OFFST</b>	 (default)	Internal temperature offset	±4 in 0.5°C steps ±8 in 1°F steps	Use the + or – buttons to step through the available options.
<b>RMT TEMP OFFST</b>	 (default)	Remote temperature offset	±4 in 0.5°C steps ±8 in 1°F steps	

Depending on the Equipment Type selected, you may have 2 heating stages and 2 cooling stages. The parameters below allow you to set the separation between when the 1<sup>st</sup> stage energizes, and the 2<sup>nd</sup> stage energizes below set point (heating) and above set point (cooling).

<b>ΔLTA 1ST STAGE</b> (heating) <sup>2</sup>	<b>0 · 25°C / 0 · 5°F</b> (default)	Heating differential 1 <sup>st</sup> stage	0.25 - 1°C in 0.25° steps 0.5 - 2°F in 0.5° steps
<b>ΔLTA 2ND STAGE</b> (heating) <sup>2</sup>	<b>1 · 0°C / 2 · 0°F</b> (default)	Heating differential 2 <sup>nd</sup> stage	0.25 - 2.0°C in 0.25° steps 0.5 - 4.0°F in 0.5° steps
<b>ΔLTA 1ST STAGE</b> (cooling) <sup>3</sup>	<b>0 · 25°C / 0 · 5°F</b> (default)	Cooling differential 1 <sup>st</sup> stage	0.25 - 1°C in 0.25° steps 0.5 - 2°F in 0.5° steps
<b>ΔLTA 2ND STAGE</b> (cooling) <sup>3</sup>	<b>1 · 0°C / 2 · 0°F</b> (default)	Cooling differential 2 <sup>nd</sup> stage °	0.25 - 2.0°C in 0.25° steps 0.5 - 4.0°F in 0.5° steps

<sup>2</sup> Not applicable for AC only (---AC)

<sup>3</sup> Not applicable for Heating only (HT--)

To avoid short cycling of the compressor, the Y1Y2 Min Off Time delays how long the cooling output will remain OFF after cooling is satisfied. The output will not reenergize until the Y1Y1 Min Off Time expires.

<b>Y1Y2 MIN OFF T</b> (Not applicable for Heat Only)	<b>5 · 0</b> (default)	Compressor protection minimum OFF time	0 - 5 minutes in 0.5 steps
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When cooling is satisfied and the output turns Off, the fan will continue to run for the time designated by FAN DELAY to minimize condensation on the cooling coil.

<b>FAN DELAY</b>	<b>0 · 5</b> (default)	Fan control relay keeps fan running for Fan Delay after cooling stops.	0 - 5 minutes in 0.5 steps
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The heating and cooling set points may be set to a limited range to prevent over heating or under cooling a space to save energy.

- HEAT MAX SETPT does not appear if EQPT TYP is AC only
- COOL MIN SETPT does not appear if set to Heat only

HEAT MAX SETPT	20.5°C / 68°F (default)	Max Heating Set point	20 - 30 °C in 0.5 ° steps 68 - 86 °F in 1 ° steps
COOL MIN SETPT	8°C / 46°F (default)	Min Cooling Set point	5 - 24°C in 0.5° steps 41 - 75°F in 1° steps

When EQPT TYP is HP, HP+EH and HT/AC you can set a DEAD BAND which determines the number of degrees between where cooling turns Off and heating turns On and vice-a-versa.

DEAD BAND	1.5°C / 3°F (default)	Dead band value is used for Auto mode.	1.5 - 5°C in 0.5°C steps 3 - 10°F in 1° steps
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The HEAT PROTECT set point creates a limit, above which the heating outputs will be de-energized regardless of the system configuration. Not displayed if AC only.

HEAT PROTECT	-- (default) = Off	Heat Protect Setpoint	30 - 35°C in 0.5 ° steps 86 - 95 °F in 1° steps
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The LOCK SRC determines if the key lock function can be controlled by the thermostat keypad (hold + and - buttons for 3+ seconds) and the App, or just by the App

<b>LOCK SRC -KY+APP</b> <small>(default)</small>	Key Lock Source	Use the + or - buttons to switch between values.
<b>LOCK SRC -APP</b>	(Device+App or App Only)	

The LCK function allows you to lock any combination of Parameter Settings, Set Point, Fan Speed, and Mode to prevent changes using the thermostat buttons.

	Settings	Set Point	Fan	Mode	
<b>LCK-NONE</b> <small>(default)</small>					<p>The Key Lock function prevents users from making changes to the selected items (Mode / FAN / Set Pt / Param) if the keypad is locked.</p> <p>The LOCK SRC parameter determines if the buttons may be locked from either the keypad or the App, or only using the App.</p> <p>To lock/unlock the buttons from the keypad press + and - for 3 seconds. The associated icons will disappear when locked.</p>
<b>LCK-PARAM</b>					
<b>LCK-SETPT</b>					
<b>LCK-SPT+PRM</b>					
<b>LCK-FAN</b>					
<b>LCK-FAN+PRM</b>					
<b>LCK-FAN+SPT</b>					
<b>LCK-FN+SPT+PRM</b>					
<b>LCK-MODE</b>					
<b>LCK-MODE+PRM</b>					
<b>LCK-MODE+SPT</b>					
<b>LCK-MO+SPT+PRM</b>					
<b>LCK-MODE+FAN</b>					
<b>LCK-MO+FAN+PRM</b>					
<b>LCK-MO+FAN+SPT</b>					
<b>LCK-ALL</b>					

Temperature values may be displayed in degrees F or in C.

<b>DEGREE UNITS</b>	°C °F (default)	C/F Selection	Use the + or – buttons to switch between °F and °C
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The display brightness may be adjusted from 1 (dim) to 10 (brightest). Increasing display brightness will impact battery life.

<b>BRIGHTNESS</b>	6 (default)	Set display brightness	Use the + or – buttons to change brightness 1 to 10
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The display may be configured to dim or turn off after the selected time frame, or if AC powered it can be set to remain on continuously.

<b>DISPLAY ON-TM</b> (default) <sup>4</sup> <b>DISPLAY ON-10</b> <b>DISPLAY ON-20</b> <b>DISPLAY ON-30</b> <b>DISPLAY ON-YES</b> <sup>4</sup>	DM = dims display after 10 seconds 10, 20 & 30 = Display On Time in seconds YES = the display remains on	Use the + or – buttons to change the display time out.
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<sup>4</sup> When powered by batteries and set to DM or YES, the display will turn off after 10 seconds.

Prompts may be shown in English, French or Spanish based on language preference.

<b>LANGUAGE -</b>	<b>EN</b> <b>ES</b> <b>FR</b>	English (default) Spanish French	Language Selection.	Use the + or – buttons to change the language prompts between English, French and Spanish
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The time display may be set to either a 24-hour format or 12-hour format

<b>24 HOUR CLOCK</b> (default) <b>12 HOUR CLOCK</b>	Time Display Format	Use the + or – buttons to change the clock setting
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The Optima S has an internal humidity sensor which is displayed by default. If you do not wish to see the humidity value, you can choose to hide the humidity reading.

<b>SHOW HUMIDITY</b> <small>(default)</small>	Show or hide humidity reading	Use the + or – buttons to switch between Show and Hide Humidity.
<b>HIDE HUMIDITY</b>		

If Equipment Type Heat Pump (HP) or AC only (--AC) is selected, and the Auxiliary Relay function is set to Humidify or Dehumidify, the Humidify Set Point prompts will be displayed. This is the set point around which the humidifier or dehumidifier will be controlled.

<b>HUMIDITY SETPT</b>	<b>45%</b> <small>(default)</small>	Set point for controlling humidifier/dehumidifier	Use the + or – buttons to change the set point value between 20 - 60%.
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If the Optima S does not have internet connection through the Gateway, you must manually set the Time, Date and Daylight Savings time.

<b>TIME 00:00</b> <sup>5</sup>	increment Hour increment Minute	Set Time and Date	Tap the symbol to increase the value for Hour and Minute.
<b>DST ADJUST ON</b> <small>(default)</small> <sup>5</sup> <b>DST ADJUST OFF</b>		Enable/disable Day Light Saving time	Use the + or – buttons to change between On and Off.
<b>SET YEAR 2020</b> <small>(default)</small> <sup>5</sup>		Set Year	Use the + or – buttons to change the value of year.
<b>DATE M/D-1/01</b> <small>(default)</small> <sup>5</sup>	increment Month increment Date	Set Month and Date	Tap the symbol to increase the value for Month and Date.

<sup>5</sup> Not displayed if connected to a Gateway and the internet

<b>EDIT-</b>	<b>WKDY/WKN</b> (default) <b>WEEKLY</b> <b>DAILY</b> <b>WKDY/SA/S</b> <b>SCH OFF</b>	Current schedule mode: Press √ to edit schedule. Press + or – to step through schedule types <sup>6</sup>	After OTA, if there is no schedule mode in the device side and it has joined network, then schedule mode is CLOUD, device receives schedule setpoint from Gateway.
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<sup>6</sup> Press  to access the Schedule menus to set the Interval, Time and Set Point. See Schedule configuration page []

The Lock/Unlock function allows you to lock and unlock the keypad through the Settings menu in addition to through the keypad and/or App.

<b>LOCK KEYS?</b> <sup>7</sup>	press √ to lock keys	To lock and unlock the keypad.
<b>UNLOCK KEYS?</b> <sup>7</sup>	press √ to unlock keys	

<sup>7</sup> Only displayed when Lock Source = KY+APP and Key Lock Type ≠ NONE

The Identify mode sends an Identify command to paired devices which support it and their display, or LED will flash on and off to indicate they are connected devices.

<b>IDENTIFY?</b> <sup>8</sup>	Press √ to Initiate Identify mode <b>IDENTIFY CHECK 10</b> is displayed	Identify devices on the shared channel	Identify mode counts from 10 to 0 minutes
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<sup>8</sup> Most simple temperature, door/window, and water leak sensors do not support Identify.

Tapping the √ to Join Network places the thermostat in a mode where it will Join an available Zigbee network. The network channel will be displayed for 3 seconds once the thermostat successfully joins.

<b>JOIN NETWORK?</b>	Press √ to join network, Press x to exit or 10 min time out	Initiate Join to an available network	Displayed only if it has not joined network.
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Note: The network Gateway or Coordinator must also be in the Join mode scanning for devices.

Used to force the thermostat to leave the current network and search for a new network to join

<b>NEW NETWORK?</b>	Press √ to delete network setting and Join next network.	Delete network settings and Join new network	Displayed only if it is Joined to network
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Note: The network Gateway or Coordinator must also be in the Join mode scanning for devices.

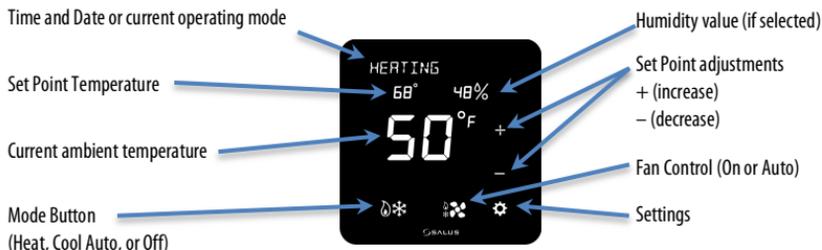
If the thermostat is not functioning as expected, you may reset it to factory defaults. All configuration and network settings will be cleared.

<b>FACTORY RESET?</b>	Press √ to factory reset to default settings and reboot.	Reset to Factory default settings	
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Note: You may first want to try a hardware reset by momentarily pressing the reset button on the bottom of the thermostat. A hardware reset will not clear configuration and network settings.

## THE HOME SCREEN

The Optima S home screen provides offers basic functions using the Home Screen controls.



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## Changing the Set Point Temperature

To change the set point, simply touch the Up (+) or Down (+) button. The ambient temperature will move to the time display area and the current set point will be displayed in the Main Temperature display. The Message Display will indicate which set point is being changed.

Touch the Main Temperature display to save the new set point and return to the Home Screen. The thermostat will save the new set point after 3 seconds of no activity and return to the Home Screen.

There is a minimum dead band between the Heat and Cool set points. If the set point being changed gets too close to the other set point, the other set point will be adjusted to maintain the separation. The default separation is 1.5°C / 3°F.

## Fan Control

The Fan operates in one of two modes, Fan Auto and Fan On. Tapping the Fan icon switches between the two modes.

- Fan Auto  the fan will run when the thermostat calls for heat or cooling.
- Fan On  the fan running continuously.

When you want the fan to be on regardless of the heating or cooling state, press to display the Fan On icon on the home screen.

There will be a slight delay between selecting Fan On mode and the fan turning on.

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## Operating Mode

To change the operating mode of the system, simply touch the Mode button to select between the following:

- **Off**  – The thermostat will not call for heat or cooling.
- **Cool**  – The thermostat will call for cooling if the room temperature is above the Cool set point.
- **Heat**  – The thermostat will call for heat if the room temperature is below the Heat set point.
- **Auto Heat/Cool**  – The thermostat will call for heat or cooling as required to keep the room temperature within the range set by the Heat and Cool set points.

Frost Protect is active by default in all the above modes, including Off and Cool. Should the room temperature drop below the Frost Protect set point, the thermostat will call for heat to prevent frost damage.

The Operating Mode will appear in the Message line, alternating between current operating mode and Day/Date.

## Locking/Unlocking Keypad

If enabled, the keypad functions may be locked or unlocked from the keypad (see settings LOCK SRC). To lock or unlock the selected functions (see settings LCK-XXX) press the + and – buttons for 3 seconds. The buttons for the selected function will disappear and appear as the function is locked and unlocked.

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## Schedule Function

The Optima S includes a flexible programmable schedule to vary set points based on time of day to reduce energy when there is an opportunity to relax the comfort level. While the schedule can be set using the keypad, it is more efficient to use the App.

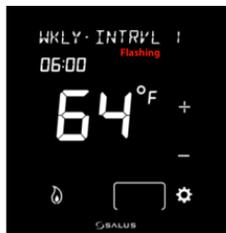
There are 5 schedule modes, each having up to 6 schedule intervals. Each Interval has a Start Time and the ability to set heating and/or cooling set points depending on the equipment type. The 5 modes are:

<b>WKDY/WKN</b>	This is a 5+ 2 schedule with M/T/W/T/F with one schedule S/S another.
<b>WEEKLY</b>	With this schedule, every day uses the same Interval settings.
<b>SCH OFF</b>	This 'Permanent Hold' mode turns the schedule Off and set points are set using the keypad or App.
<b>WKDY/SA/S</b>	This is a 5 + 1 + 1 schedule with M/T/W/T/F with one schedule Sat and Sun each with their own.
<b>DAILY</b>	This schedule mode each day is configured with its own schedule intervals.

To select the Schedule mode, press the  $\sqrt{\quad}$  button

		<table border="1"> <tr><td>TYPE-WKDY/WKN</td></tr> <tr><td>TYPE-WEEKLY</td></tr> <tr><td>TYPE-SCH OFF</td></tr> <tr><td>TYPE-WKDY/SA/S</td></tr> <tr><td>TYPE-DAILY</td></tr> </table>	TYPE-WKDY/WKN	TYPE-WEEKLY	TYPE-SCH OFF	TYPE-WKDY/SA/S	TYPE-DAILY	<p>Use the + or – buttons to change selection. Press the  button.</p>
TYPE-WKDY/WKN								
TYPE-WEEKLY								
TYPE-SCH OFF								
TYPE-WKDY/SA/S								
TYPE-DAILY								

Tap the Settings button to edit the Schedule Interval 1



Interval # will flash	Tap + or – button to select a different Interval Tap  button to move to edit time
Time will flash	Tap + or – to increase or decrease the time Tap  button to move to edit the set point temp
Temperature will flash	Tap + or – to increase or decrease the set point temp Tap Mode to switch between heat or cool set point Tap  button to return to Interval
Interval # will flash	Tap + or – button to select a different Interval

Continue to edit the Interval #, Time and Set Point(s) for each of the Intervals desired by advancing the Interval and editing the Time and Temperature.

For applications where there is both heating and cooling, once you have set the heat set point, tap the mode button so the cooling icon s

If you wish to skip an Interval (ex 4 intervals: Sleep, Wake, Leave, Return) allow the Time setting for unwanted intervals to be blank (Time = --:-- and Temperature = --).

When using a Daily, WKDY/WKND, or WKDY/SA/S schedule, to select the alternate periods, with the Interval # flashing continue to tap the + or – buttons to step through the intervals for each; Day, WKDY & WKND, and WKDY, SA and S

## Temporary Hold

The thermostat may be placed in a temporary hold state which will temporarily override the schedule settings until the next interval time is reached. To temporarily override the scheduled set point, simply increase (+) or decrease (-) set point. When the next interval time occurs, the thermostat will resume its programmed schedule.

## Permanent Hold

To permanently override the schedule, you must turn the schedule Off either through the thermostat menu (**TYPE-SCH OFF**), or by using the App. When the schedule is Off the Permanent Hold icon  will appear on the thermostat display.

The current set point will be maintained until a future change is made, or The Permanent Hold is turned Off by selecting a Schedule mode.

## Pairing Optima S with SS909ZB Temperature Sensor

When the thermostat is located where it may not read the optimum temperature for the comfort zone, a remote wireless sensor (SS909ZB) may be paired with the thermostat and the ambient temperature of the remote sensor will be used for control.

If the sensor has not been previously associated with a Zigbee network:

- 1) Place the Gateway or Coordinator in Joining mode (Scan for devices)
  - 2) Place the Optima S in Identify mode:
    - a) Tap the Settings button until **IDENTIFY ?** is displayed
    - b) Tap  and **IDENTIFY CHECK ! ?** will be displayed and count down from 10 to 0 minutes.
  - 3) Remove the SS909ZB from the packaging:
    - a) Remove the front cover by lifting slightly on the top edge and pulling forward.
    - b) Remove the red battery tab
      - i) The LED on the Sensor will flash 3 times, pause, and repeat
      - ii) When the LED on the Sensor stops flashing it will have joined the network and paired with the Optima S
-

If the SS909ZB had previously joined the network, but is not paired with the Optima S:

- 1) Place the Optima S in Identify mode (step 2 above).
  - 2) Place the SS909ZB in pairing mode:
    - a) Hold the network button on the side of the sensor for 3 seconds until the LED turns Red
    - b) Within 2 seconds of the LED turning Red:
      - i) Release, press, and release the network button on the sensor.
      - ii) The LED on the Sensor will flash 3 times, pause, and repeat
      - iii) When the LED on the Sensor stops flashing it will have paired with the Optima S
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## SPECIFICATIONS

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Temperature units	°C or °F
Operating temperature	32-122 °F (0-50 °C)
Indoor temperature measurement range	32-104 °F (0-40 °C)
Protocol	ZigBee – Home Automation 1.0
AC power	18-30 VAC at RC and C terminals
Battery Power *	2 x AA Alkaline batteries
Battery Life	18 months under normal usage
Size	4.2" (L) x 4.2" (W) x 1.1" (H) 10.7cm (L) x 10.7cm (W) x 2.9cm (H)
Weight	0.76 lbs (345 g)

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\* The ST898ZBR thermostat functions as a router to the network. Because of the frequent need to transmit and receive the ST898ZBR must be powered by 24VAC with RC and C wires.

Specifications may change without notice

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## TROUBLESHOOTING

### **The thermostat does not call for heat and/or cooling.**

- Check that the connector pins are straight.
- Check that the thermostat is fully seated on the mounting plate. If the terminal connections are not fully engaged, the firmware does not activate the relays. This prevents power surges to the HVAC system.

### **The heat and cooling are reversed.**

- Check that the thermostat is configured properly, Heat Pump or Non Heat Pump. If Heat Pump, Check that the O/B configuration is correct.
- Check that the wiring is correct, especially the Y and W wires. If Heat Pump, Check that the O/B wire is correct.

### **The fan does not turn on.**

- Check that the wiring is correct, especially the G wire.
- If oil or gas heating, make sure the furnace is working. In furnace mode (FURNC), the fan is under furnace control to avoid a blast of cold air at the start.

### **Display does not appear when low batteries are replaced.**

- Press the Reset button on the bottom of the thermostat with a straightened paper clip or pen point.
-

## SALUS WARRANTY

SALUS North America, Inc. (“Salus”) warrants that for a period of two (2) years (“Warranty Period”) from the date of purchase by the consumer (“Customer”), this device, excluding batteries (“Product”), shall be free of defects in materials and workmanship under normal use and service in accordance with all supplied instructions. During the warranty period, Salus shall, at its option, repair or replace any defective Products, at no charge for the device. Any replacement and/or repaired devices are warranted for the remainder of the original Warranty Period or ninety (90) days, whichever is longer.

This warranty does not cover removal or reinstallation costs. This warranty does not apply to any Product (i) which has been modified, repaired, or altered, except by Salus or an authorized Salus representative, (ii) which has not been maintained in accordance with any handling or operating instructions supplied by Salus, or (iii) which has been subjected to unusual physical or electrical stress, misuses, abuse, negligence or accidents.

This warranty is the only express warranty Salus makes for the Product. Any implied warranties, including warranties of merchantability or fitness for a particular purpose, are limited to the Warranty Period or the shortest period allowed by law.

SALUS SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE OF ANY KIND, INCLUDING ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING, DIRECTLY OR INDIRECTLY, FROM ANY BREACH OF ANY WARRANTY, EXPRESS OR IMPLIED, OR ANY OTHER FAILURE OF THIS PRODUCT. Some states and provinces do not allow the exclusion or limitation of incidental or consequential damages, or limitation on the duration of implied warranties of merchantability or fitness, so these exclusions or limitations may not apply to you.

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No oral or written information or advice given by Salus or a Salus-authorized representative shall modify or extend this warranty. If any term is held to be illegal or unenforceable, the legality or enforceability of the remaining terms shall not be affected or impaired.

Customer's sole and exclusive remedy under this limited warranty is product repair or replacement as provided herein. If a Product under warranty is defective, the Customer may:

- contact the party ("Seller") from which the Customer purchased the Product to obtain an equivalent replacement product after the Seller has determined that the Product is defective and the Customer is eligible for a replacement, or,
- contact Salus Service at [support@salusinc.com](mailto:support@salusinc.com), to determine whether the device qualifies for a replacement. If a replacement is warranted and is shipped prior to the return of the device under warranty, a credit card is required and a hold may be placed on the Customer's credit card for the value of the replacement until the returned device is verified as eligible for replacement, in which case, the Customer's credit card will not be charged.

This warranty gives you specific legal rights, and you may also have other rights that vary from jurisdiction to jurisdiction. If you have any questions regarding this warranty, please write Salus at:

SALUS North America, Inc.  
2215 Cornell Avenue  
Montgomery, IL 60538

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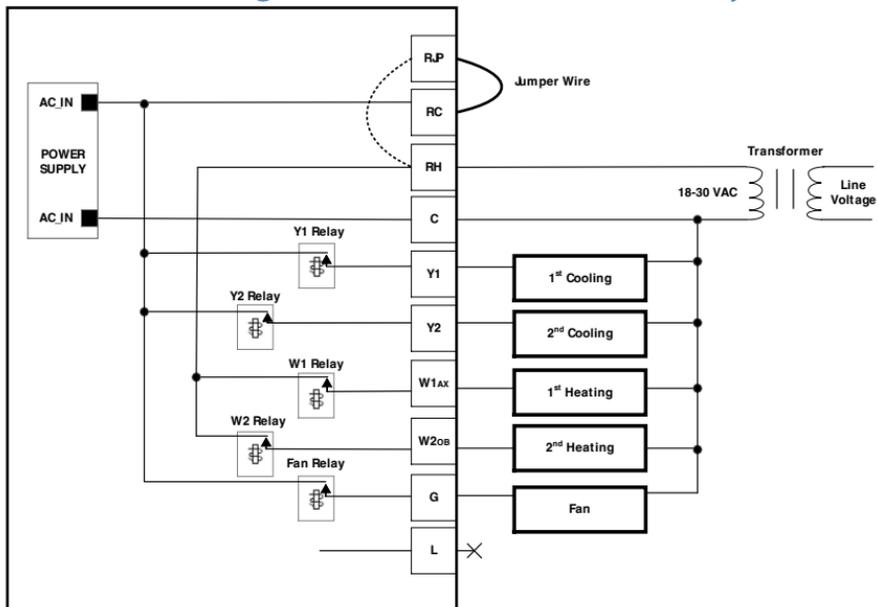
## APPENDIX A – WIRING DIAGRAMS

### Terminal Definitions

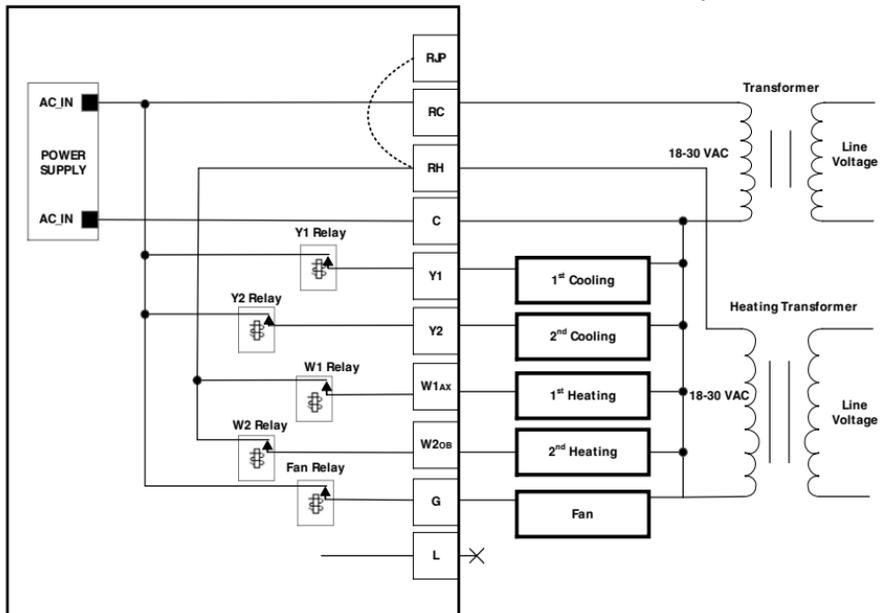
<b>Optima S Thermostat Terminal Reference</b>		
<b>Terminal</b>	<b>Non-Heat Pump</b>	<b>Heat Pump</b>
RJP	Power Jumper (RH)	
RC	24 VAC for Cooling System or Jumper to RJP	
RH	24 VAC for Heating System	24 VAC for Heat Pump
C	24 VAC Common Return	
Y1	Single or 1 <sup>st</sup> Stage Cooling	Single or 1 <sup>st</sup> Stage Compressor
Y2	2 <sup>nd</sup> Stage Cooling	2 <sup>nd</sup> Stage Compressor
W1AX	Single or 1 <sup>st</sup> Stage Heating	Auxiliary or Emergency Heat
W2OB	2 <sup>nd</sup> Stage Heating	Changeover Valve
G	Fan Control	
L	Not Used	System Monitor

ST898ZBR requires RH/RC and a C-wire and cannot operate on batteries.

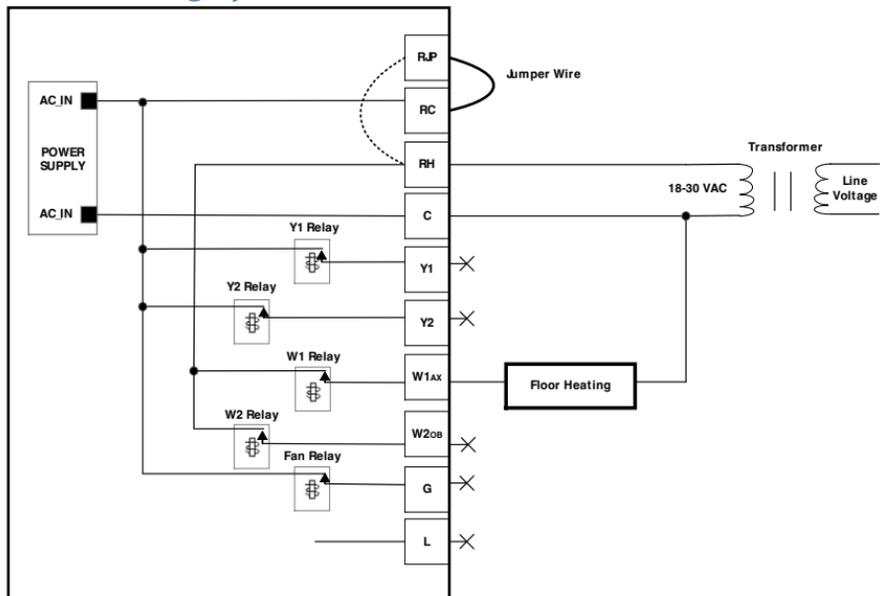
## Conventional Single Transformer Heat and Cool System



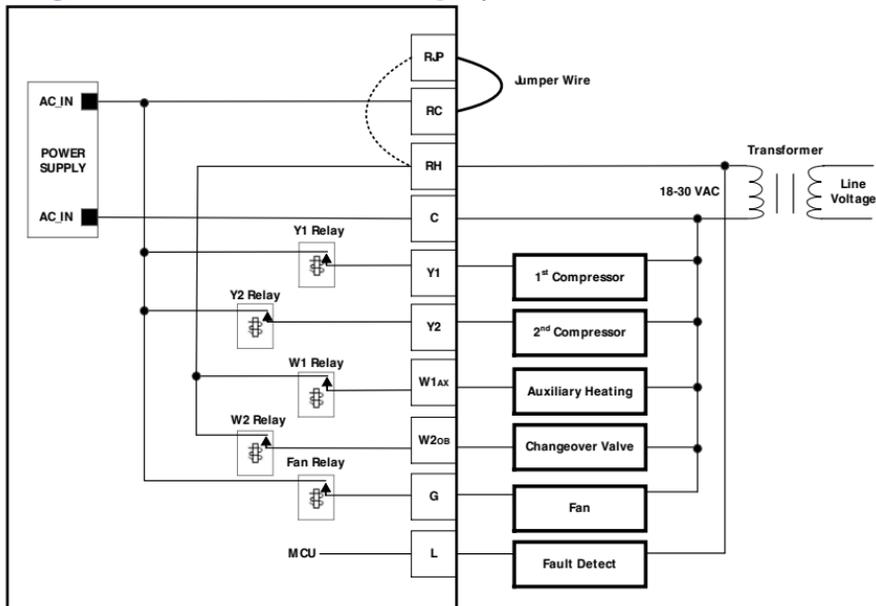
## Conventional Two Transformer Heat and Cool System



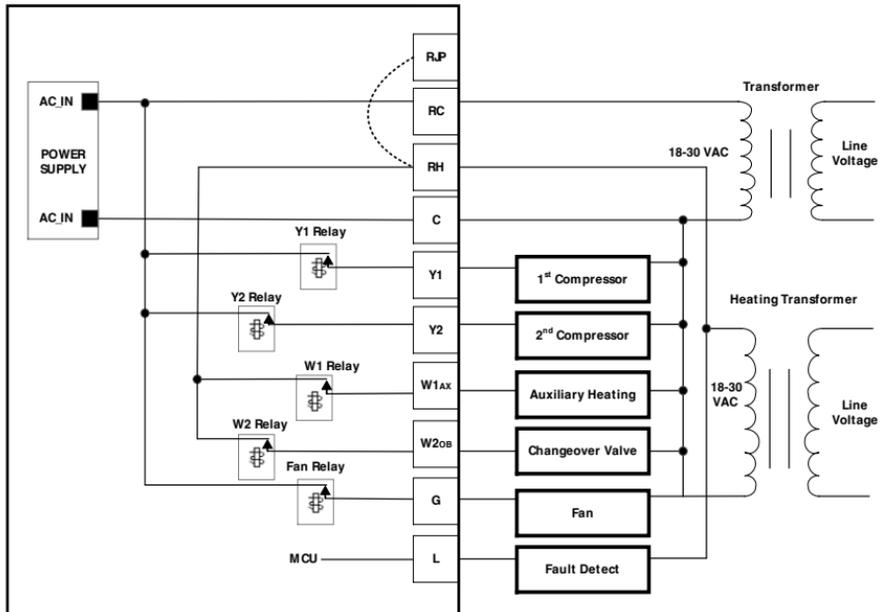
## Floor Heating System



## Single Transformer Heat Pump System



## Two Transformer Heat Pump System



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## APPENDIX B – REGULATORY STATEMENTS

### FCC Statements

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

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.

**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.
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## FCC and Industry Canada

**RF Radiation Exposure statement:** This equipment complies with FCC and Industry Canada RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the antenna and all persons.

## Industry Canada

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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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For Sales assistance: [sales@salusinc.com](mailto:sales@salusinc.com)  
For technical support: [support@salusinc.com](mailto:support@salusinc.com)

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