

INSTALLATION

WARNINGS AND CAUTIONS:

- TO BE INSTALLED AND/OR USED IN ACCORDANCE WITH APPROPRIATE ELECTRICAL CODES AND REGULATIONS.
- IF YOU ARE NOT SURE ABOUT ANY PART OF THESE INSTRUCTIONS, CONSULT AN ELECTRICIAN.
- THERMOSTATS ARE INTENDED ONLY FOR USE INDOORS, IN DRY LOCATIONS, AND WITH PERMANENTLY INSTALLED FIXTURES.

DESCRIPTION:

The 24VAC Thermostat provides digital temperature control of heating and cooling—with wireless communication to multiple Leviton devices. It is designed for use with most basic gas/electric furnace/air conditioning units, PTHP/PTAC Systems, 4-pipe, or 2-pipe fan coil systems. Solid-state control outputs allow switching of electronic and relay loads of 1.5 amps. This control operates from a single setpoint with automatic changeover between heating and cooling. The fan cycles on/off with calls for heating or cooling or can operate continuously in either low, medium, or high speed. The control can be placed in economy mode or off mode with 40° freeze protection. Economy mode is enabled and disabled by one or more compatible transmitters.

COMPATIBLE DEVICES:

- Key Card Access Switch
- Dual Rocker Handheld Remote
- SLT Wireless Sensor
- More transmitters available
- Single Rocker Self-powered Wireless Light Switches
- Dual Rocker Self-powered Wireless Light Switches
- Self-powered Wireless Occupancy Sensor

COMPONENTS INCLUDED:

- Leviton 24VAC Thermostat
- (1) Self Tapping Screw
- (2) Mounting Screws (6/32" x 3/4")
- (1) Mounting Bracket

OPTIONAL ACCESSORIES:

- Horizontal Mounting Plate (not included)

TOOLS NEEDED FOR INSTALLATION:

- Phillips Screwdriver
- Wire Nuts
- Electrical Tape

PROGRAMMING THE THERMOSTAT:

Connect the thermostat to a 24VAC power source for initial setup. DO NOT CONNECT THE OTHER WIRES UNTIL THIS STEP IS COMPLETE. PREVENT ALL OTHER WIRES FROM TOUCHING DURING THIS PROCESS TO AVOID DAMAGE TO THE THERMOSTAT. DAMAGE DUE TO INCORRECT WIRING WILL VOID WARRANTY. The programming mode has a time limit of 10 minutes. After 10 minutes, the thermostat will resume normal operation. The default values mentioned throughout this section refer to factory programmed settings. If the thermostat has been custom programmed, the defaults may not apply.

NOTE: For programming large numbers of devices, an accessory is available to copy settings from one device to another. Contact Leviton for details.

Access Code 43:

Configuration Mode

1. Place thermostat into programming mode by pressing and holding the UP and DOWN arrows while sliding the °F/°C switch to the opposite side. 00 will appear on the display. Do not use the °F/°C switch again until done programming.
2. Press either the up or down arrow button to find the access code 43 then press the fan button.
3. Press either the up or down arrow button to scroll through the menu to reach the desired parameter (see below), then press the Fan button.

Exit Menu (Ext):

Equipment Type (E9P):

- tHP - Default, Trane heat pump, type O reverse valve
- tAC - Trane AC with electric heat
- FHP - Friedrich heat pump, type B reverse valve
- FAC - Friedrich AC with electric heat
- gHP - GE heat pump, type B reverse valve
- gAC - GE AC with electric heat
- AHP - Amana heat pump, type B reverse valve
- AAC - Amana AC with electric heat
- FC - fan coil

Reverse Valve Type (typ):

- O type - Default, energizes in calls for cooling
- B type - energizes in calls for heating

Heat Pump or AC (Pt):

- HP - Default, 2 stage heat, single stage cool
- Y = compressor, W = 2nd stage heat
- AC - AC and electric heat
- Y = cool, W = heat

Fan Speed and Operation (FOP):

- 1U - single speed user selectable fan
- 1C - single speed constant fan
- 1A - single speed auto fan
- 2U - Default, two speed user selectable fan
- 2C - two speed constant fan
- 2A - two speed auto fan

Three speed fan only available for fan coil equipment

- 3U - three speed user selectable fan
- 3C - three speed constant fan
- 3A - three speed auto fan

Compressor Protection (FCp):

- CP - Default heat pump, compressor protection and high fan is allowed in heating
- NP - Default fan coil, no compressor protection and high fan is allowed in heating
- CP - compressor protection and high fan is allowed in heating
- nP - no compressor protection and only low fan is allowed in heating
- cP - compressor protection and only low fan is allowed in heating

Continuous Fan Operation (CFL):

- Dis - Default, normal fan operation
- Ena - continuous low fan in auto or economy modes

4. Press either up or down to reach desired change.
5. Press fan button to return to program menu.
6. Press Up or Down arrow until End / Prog appear on the display.
7. Press fan button to save changes and exit the program mode. You will need to re-enter programming mode to access a different code.

Access Code 79:

Field Programming Mode

1. Place thermostat into programming mode by pressing and holding the UP and DOWN arrows while sliding the °F/°C switch to the opposite side. 00 will appear on the display. Do not use the °F/°C switch again until done programming.
2. Press either the up or down arrow button to find the access code 79 then press the fan button.
3. Press either the up or down arrow button to scroll through the menu to reach the desired parameter (see below), then press the Fan button.
4. Press either up or down to reach desired change.

Exit Menu (Ext):

Temperature Scale (Unt):

- F - Default, °F
- C - °C

Display Temperature (dSP):

- SP - Default, display will show setpoint only
- rt - display will show room temperature unless either up or down arrow button is pressed. Then the display will show setpoint.
- Srt - display will toggle between room temperature and setpoint. Display will revert to setpoint when either the up or down arrow button is pressed.

Temperature Control Mode (HAC):

- USr - Default, switch selectable, heat only, auto changeover or cool only
- AUt - auto mode only
- CL - cool mode only
- Ht - heat mode only

Off Function Enabled (OFF):

- Ena - Default, enabled, press fan button until OFF appears on display
- dis - disabled

Economy Function Enabled (ECo):

- Ena - Default, enabled, press fan button until Eco and ECON appears on display
- dis - disabled

Comfort Setpoint (CS):

- 72.0°F (22.0°C) Default
- Programmable Range: 60.0°F to 85.0°F (15.5°C to 29.5°C)

Cooling Limit (LC):

- 65.0°F (18.5°C) Default
- Programmable Range: 60.0°F to 85.0°F (15.5°C to 29.5°C)

Heating Limit (LH):

- 85.0°F (29.5°C) Default
- Programmable Range: 60.0°F to 85.0°F (15.5°C to 29.5°C)

Freeze Protection (FP):

- Ena - Default, enabled at 40°F
- dis - Disabled

Fan Purge Timer (FPT):

- 30 seconds Default
- Programmable Range: 0 (Off) to 180 seconds (3 minutes), in 10 second increment

Clear Logged Data (CLr):

- No - Default, no reset
- Yes - Reset

Setback Ramping (Sbr):

- dis - Default, disabled, directly to economy setpoint
- Ena - Enabled, ramps to economy setpoints
- OFF - Directly to Off mode

Ramping Setback Timer (rSt):

After setback is initiated, selects the amount of time the setpoint will be stepped back by the degrees per setback

Example: if both parameters are defaulted, the thermostat will step back 1° per every 30 minutes until either the economy cooling limit (EC) or the economy heating limit (EC) is reached.

- 30 minutes Default
- Programmable Range: 1 minute to 720 minutes (12 hours), in 15 minute increment

Degrees Per Setback (dPs):

- 1° Default
- Programmable Range: 0°F to 3°F, in 0.5°F increments

Economy Cooling Limit (EC):

- 85.0°F (29.5°C) Default
- Programmable Range: 72.0°F to 99.0°F (22.0°C to 37.0°C), in 0.5°F increments

Economy Heating Limit (EH):

- 60.0°F (15.5°C) Default
- Programmable Range: 41.0°F to 72.0°F (5.0°C to 22.0°C), in 0.5°F increments

Fan Refresh Frequency (FrF):

- 0 hours Default, disabled
- Programmable Range: 0 hours to 24 hours

Fan Refresh Duration (Frd):

- 1 minute Default
- Programmable Range: 1 minute to 45 minutes

Cycle Rate Timer (crt):

- Limits the number of heat/cool cycles per hour
- 6 cycles per hour Default, heat pump
- 8 cycles per hour Default, fan coil
- Programmable Range: 0 (Off) to 12 cycles per hour, heat pump
- Programmable Range: 0 (Off) to 24 cycles per hour, fan coil

Differential (Dif):

- Selects the minimum room temperature above or below setpoint when heating or cooling will turn on or off.
- 0.4°F (0.2°C) Default
- Programmable Range (°F): 0.2, 0.4, 0.6, 0.8, 1.0, 1.2
- Programmable Range (°C): 0.1, 0.2, 0.3, 0.4, 0.5, 0.6

Setpoint Hold Timer (SH):

- Selects a time limit that the occupant's setpoint will be saved, when in economy mode.
- 0 hours Default, disabled
- Programmable Range: 0 to 24 hours

Fan Hold Timer (Hft):

- Selects a time limit the high and low fans will operate before automatically returning to auto mode.
- 0 hours Default, disabled
- Programmable Range: 0 to 24 hours

Shutdown Delay (Sdd):

- Selects the amount of time delay between remote shutdown signal and the thermostat going into shutdown mode.
- 0 seconds Default, immediate
- Programmable Range: 0 seconds to 200 minutes

5. Press fan button to return to program menu.
6. Press Up or Down arrow until End / Prog appear on the display.
7. Press fan button to save changes and exit the program mode. You will need to re-enter programming mode to access a different code.

Access Code 92:

Restore Factory Presets

1. Place thermostat into programming mode by pressing and holding the UP and DOWN arrows while sliding the °F/°C switch to the opposite side. 00 will appear on the display. Do not use the °F/°C switch again until done programming.

2. Press either the up or down arrow button to find the access code 92 then press the fan button.

3. All and Erase will appear on the display. Press the fan button again to rest to factory defaults.

4. Press Up or Down arrow until End / Prog appear on the display.

5. Press fan button to save changes and exit the program mode. You will need to re-enter programming mode to access a different code.

NOTE: This procedure does not affect the stored switches in memory. See the "Programming the Radio Receiver" section for methods to clear this memory.

INSTALLATION

Junction box mounting is highly recommended. For optimal radio performance do not mount or place the receivers close to the floor or inside a metal housing.

INSTALLATION OPTION A:

Heat Pump Configuration

1. **WARNING:** To avoid risk of fire, shock, or death, **TURN OFF POWER** at circuit breaker or fuse and verify that it is OFF before installation begins. Make sure that it remains OFF until installation is complete.
2. Read all steps for this option before taking any action to install thermostat.
3. If retrofitting old thermostat, remove old thermostat, carefully noting the wire connections on the old unit. Record wire color and terminal legends (Cable wire color for Control Feed, Load Feed, Common, Auxiliary Heat, Compressor, Low Fan, High Fan, and Reversing Valve). Refer to **Table A**.

4. Install mounting bracket to the junction box with provided mounting screws.
5. Wire thermostat according to function as shown in **Figure A**.

6. Push wires into junction box. Rest bottom of thermostat on mounting tabs in mounting plate. Push top of thermostat towards wall and secure into place with self-tapping screw.

7. Turn power on.

INSTALLATION OPTION B:

4-Pipe Fan Coil Configuration

1. **WARNING:** To avoid risk of fire, shock, or death, **TURN OFF POWER** at circuit breaker or fuse and verify that it is OFF before installation begins. Make sure that it remains OFF until installation is complete.

2. Read all steps for this option before taking any action to install thermostat.

3. If retrofitting old thermostat, remove old thermostat, carefully noting the wire connections on the old unit. Record wire color and terminal legends (Cable wire color for Control Feed, Load Feed, Common, Auxiliary Heat, Compressor, Low Fan, High Fan, and Reversing Valve). Refer to **Table A**.

4. Install mounting bracket to the junction box with provided mounting screws.

5. Wire thermostat according to function as shown in **Figure B**. **NOTE:** If the mechanical system has only two fan speeds: Green - Low Fan, Violet - High Fan, Orange - Not used.

6. Push wires into junction box. Rest bottom of thermostat on mounting tabs in mounting plate. Push top of thermostat towards wall and secure into place with self-tapping screw (included).

7. Turn power On.

INSTALLATION OPTION C:

2-Pipe Fan Coil Configuration

NOTE: Continuous fan is not available on 2-Pipe with Aquastat systems. Continuous fan is available on 2-Pipe with electric heat systems.

1. Follow instructions for a 4-Pipe installation but using **Figure C** for 2-Pipe Fan Coil with Aquastat or **Figure D** for 2-Pipe Fan Coil with Electric Heat.

2. Push wires into junction box. Rest bottom of thermostat on mounting tabs in mounting plate. Push top of thermostat towards wall and secure into place with self-tapping screw (included).

3. Turn power On.

PROGRAMMING THE RADIO RECEIVER

The thermostat can be configured to operate with many Leviton transmitters. Depending on the transmitter type and the intended application, the thermostat will need to be programmed to operate in Rocker Mode, Momentary Mode, Toggle Mode, or Scene Mode. Multiple modes can be used with one thermostat. For transmitter installation instructions, see appropriate installation guide. Select the desired Learn Mode below to program the thermostat.

CLEAR MODE:

Clearing the Switch Memory

In order the clear the switch memory within the thermostat, use the following steps:

1. Press and hold the UP and DOWN buttons until CLr appears on the display (approximately 10 seconds). This will delete all associated transmitters from the memory.

LEARN MODE 0:

Rocker Mode - Wireless Switch Control of Thermostat

Rocker Mode is usually used with Leviton Wireless Light Switches. The thermostat goes into occupied mode when the top of the rocker switch is pressed and unoccupied mode when the bottom of the rocker switch is pressed.

1. Place the thermostat into Learn Mode by pressing and holding the UP and DOWN buttons until LRN appears on the display (approx. 5 seconds). The display will alternate between LRN and 0 indicating that it is in Learn Mode 0 - Rocker Mode.

2. Press one of the rockers on the Leviton Wireless Light Switch. The display on the thermostat will briefly display ADD indicating that it has added that transmitter.

3. The display will resume alternating between LRN and 0 - add more transmitters as desired for this mode (up to 30). The small digit on the display will indicate the number of receivers in memory for each mode.

4. To delete a transmitter from the thermostat, press the wireless light switch again. The display on the thermostat will briefly display DEL indicating that it has deleted that transmitter.

5. Exit Learn Mode by pressing and holding the UP and DOWN buttons until LOC appears on the display or wait 30 seconds to normal operating mode. This indicates that all learned transmitters have been locked into memory on the thermostat.

NOTE: These steps are also used for Manual On/Auto Off - when learning a wireless occupancy sensor.

LEARN MODE 1:

Momentary Mode - Keycard Switch Control of Thermostat

Momentary Mode is used with Leviton Wireless Key Card Switches. The thermostat will be in occupied mode when the key card is inserted and unoccupied when the key card is removed.

1. Place the thermostat into Learn Mode by pressing and holding the UP and DOWN buttons until LRN appears on the display. The display will alternate between LRN and 0 indicating that it is in Learn Mode 0.

2. Press and release the UP button. The display will alternate between LRN and 1, indicating that it is in Learn Mode 1 - Momentary Mode.

3. Insert a key card into an Leviton Key Card Access Switch. The display on the thermostat will briefly display ADD indicating that it has added that transmitter.

4. The display will resume alternating between LRN and 1 - add more transmitters as desired for this mode.

5. To delete a transmitter from the thermostat, remove the key card (if inserted) of a learned switch and insert it again. The display on the thermostat will briefly display DEL indicating that it has deleted that transmitter from memory.

6. Exit Learn Mode by pressing and holding the UP and DOWN buttons until LOC appears on the display or wait 30 seconds to normal operating mode. This indicates that all learned transmitters have been locked into memory on the thermostat.
- NOTE:** These steps are also used for Auto On/Auto Off - Occupancy Sensor Control.

LEARN MODE 2:
Toggle Mode - Toggle Mode is available for future product releases.

- Place the thermostat into Learn Mode by pressing and holding the UP and DOWN buttons until LRN appears on the display. The display will alternate between LRN and 0 indicating that it is in Learn Mode 0.
- Press and release the UP button. The display will alternate between LRN and 1, indicating that it is in Learn Mode 1 - Momentary Mode.
- Press and release the UP button. The display will alternate between LRN and 2, indicating that it is in Learn Mode 2 - Toggle Mode.
- Press the transmit button on the desired transmitter. The display on the thermostat will briefly display ADD indicating that it has added that transmitter.
- The display will resume alternating between LRN and 2 - add more transmitters as desired for this mode.
- To delete a transmitter from the thermostat, press the learned transmit button again. The display on the thermostat will briefly display DEL indicating that it has deleted that transmitter.
- Exit Learn Mode by pressing and holding the UP and DOWN buttons until LOC appears on the display or wait 30 seconds to normal operating mode. This indicates that all learned transmitters have been locked into memory on the thermostat.

LEARN MODE 3:
Scene Mode - For Future Product Releases

Specifications	
	WS0TH
Range	50-150 feet
Frequency	315 MHz
Input Voltage	24 VAC
Max Loads	1.5 amp/circuit
Temperature Monitor Range	32.0° F to 99.9° F (0° C to 37.7° C)
Temperature Set Point Range	60° F to 85° F (15.5° C to 29.5° C)
Operating Temperature	14° F to 131° F (-10° C to 55° C)
Storage Temperature	-4° F to 131° F (-20° C to 55° C)
Sampling Rate	Every 5 seconds
Display Format	Liquid Crystal Display (LCD)
Fan Control	Selectable : Auto Cycle, Low, Medium, High, Economy, Off
Memory	Stores up to 30 switch IDs
Accuracy	+/- 1° F (0.5° C)
Heat/Cool Control	1 Heat and 1 Cool circuit, Heat pump reversing valve circuit
Dimensions	3.5 x 5.0 x 1.5 inches
Radio Certifications	FCC (U.S. SZV-TCM2XXC), IC (Canada 5713A-TCM2XXC)

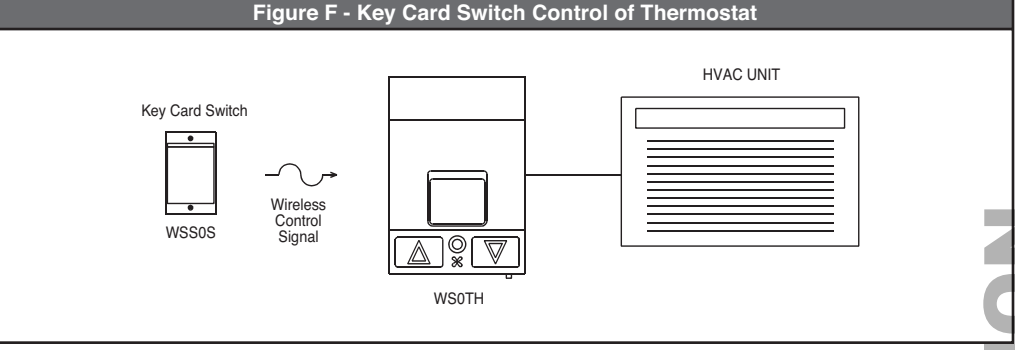
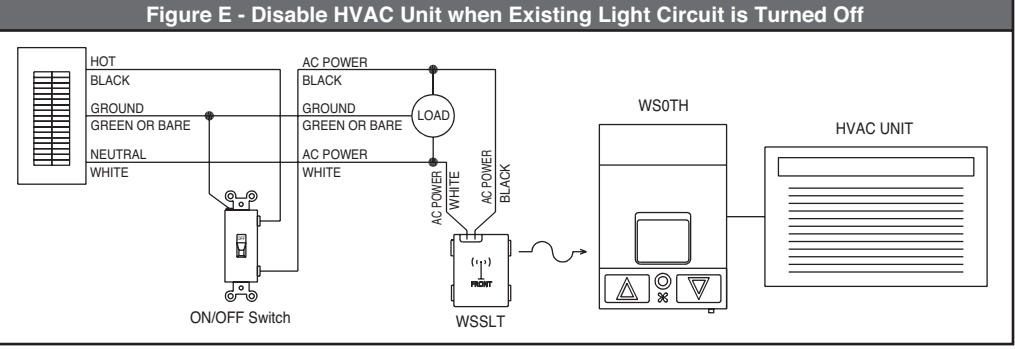
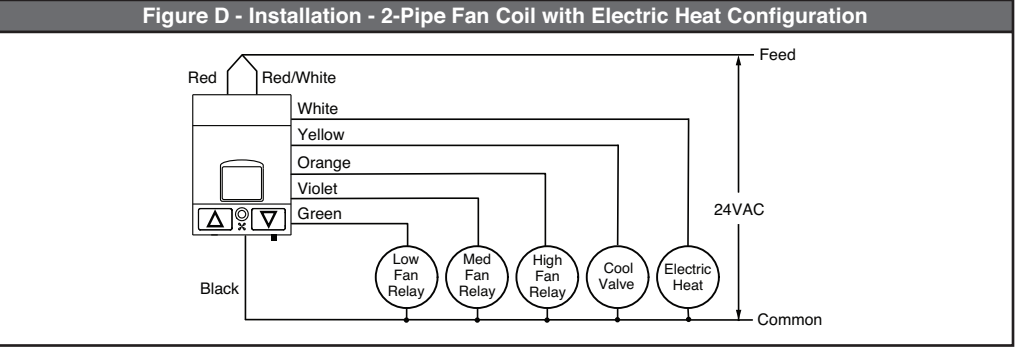
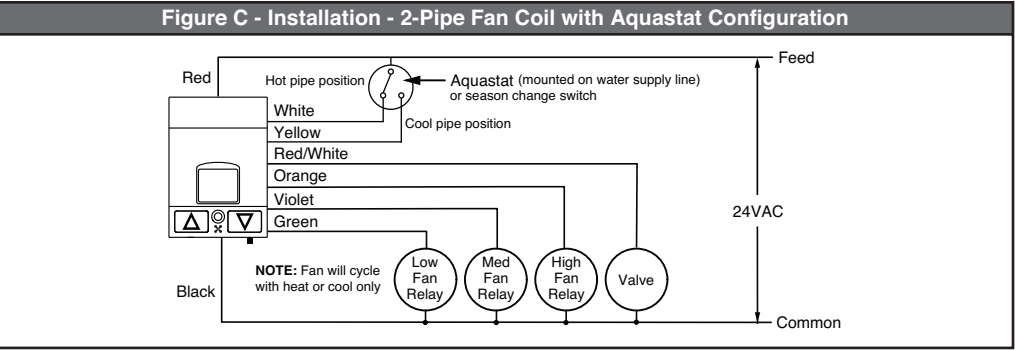
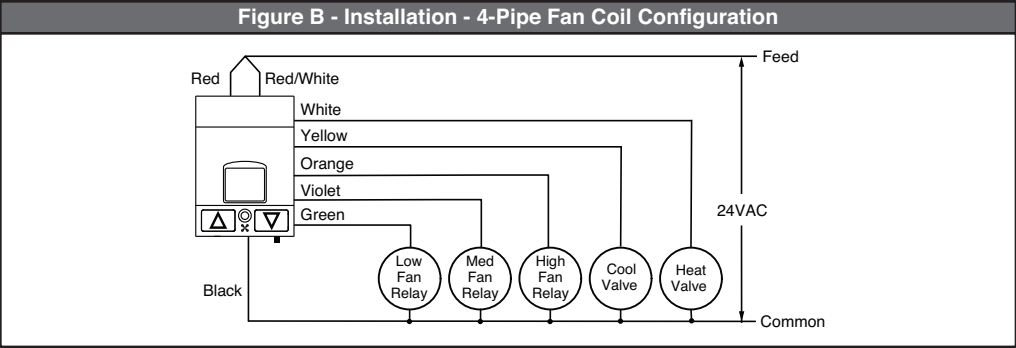
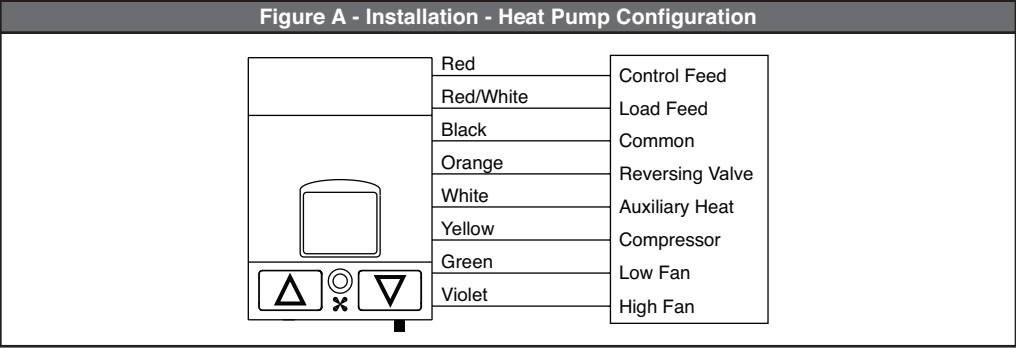
TABLES/WIRING DIAGRAMS:

Table A:

NOTE: This table is provided for reference and is not intended to match every situation. Multiple installation options are available. Wiring connections should be made by a qualified HVAC Contractor. If unsure about wire colors or terminal functions, contact a qualified HVAC contractor. If connections are not made properly, damage to equipment or property could result.

Conventional HVAC Systems			
Commonly Used Wiring Terminal Designators	Possible Wire Color	Possible Signal Names/Functions	Comments
C	Black	24VAC Common	From one side of the 24VAC transformer, usually called the common side.
R or V	Red	24VAC Hot	From other side of the 24Vac transformer, usually called the hot side. The thermostat may connect this terminal with W (call for heat) or Y (call for cool), if RH and RC are not used/available. Some thermostats also use this to supply power to themselves.
RH or 4	Red	24VAC hot usually used for call for heat	Functions as the source of power for the W terminal. The thermostat usually connects this terminal with W when it calls for heat.
RC	Red	24VAC hot usually used for call for cool	Functions as the source of power for the Y terminal. The thermostat usually connects this terminal with Y when it calls for heat.
G	Green	Active blower fan	The fan switch on the thermostat usually connects this terminal with R when it is in the ON position.
W or W1 or W2	White	Call for heat	The thermostat usually connects this terminal with R or RH when it calls for heat. The thermostat usually connects this terminal with G when the fan switch is set to AUTO. Some thermostats require a jumper from W to Y if a heat pump is used. Other thermostats might use this as second-stage heating. Sometimes W2 designates auxiliary heating in systems that use heat pumps.
Y	Yellow	Call for cool	The thermostat usually connects this terminal with R or RC when it calls for heat. The thermostat usually connects this terminal with G when the fan switch is set to AUTO. Could also be for cooling of first-stage heating on a heat pump.
S1 and S2	Varies	Outside air temperature display	Used to display the outside air temperature on some digital thermostats.

Systems with Heat Pumps or Staged Heating/Cooling Sub-systems			
Commonly Used Wiring Terminal Designators	Possible Wire Color	Possible Signal Names/Functions	Comments
C	Black	24VAC Common	From one side of the 24VAC transformer, usually called the common side.
R	Red	24VAC Hot	From other side of the 24Vac transformer, usually called the hot side. The thermostat may connect this terminal with W (call for heat) or Y (call for cool), if RH and RC are not used/available. Some thermostats also use this to supply power to themselves.
RH	Red	24VAC hot usually used for call for heat	Functions as the source of power for the W terminal. The thermostat usually connects this terminal with W when it calls for heat.
RC	Red	24VAC hot usually used for call for cool	Functions as the source of power for the Y terminal. The thermostat usually connects this terminal with Y when it calls for heat.
Y	Yellow	Call for cool	The thermostat usually connects this terminal with R or RC when it calls for heat. The thermostat usually connects this terminal with G when the fan switch is set to AUTO. Could also be for cooling of first-stage heating on a heat pump.
Y2	Blue, Orange, Pink	Second-stage cooling	Activates the second stage cooling.
W2 or W	Varies	Second-stage heating	Activates first stage auxiliary heating on a heat pump.
G	Green	Active blower fan	The fan switch on the thermostat usually connects this terminal with R when it is in the ON position.
E	Varies, blue, pink, gray, tan	Emergency heat relay on a heat pump. Active all the time when selected, usually not used	Disables the heat pump and turns on first stage auxiliary heating.
O	Varies, Orange	Reversing valve	Energize to cool. Switches from heat to cool on heat pumps.
B	Varies, blue, black, brown, orange	For GE, York, Trane, and possibly others: 24VAC common	From one side of the 24Vac transformer, usually called the common side.
		For Rheem, Ruud and Weatherking and possibly others: Activate reversing valve	May be needed on some electronic thermostats or may be needed if you have indicator lamps.
X	Varies	24VAC common or emergency heat relay	Check with the manufacturer to be certain.
X2	Varies	Second stage heating or indicator lights on some thermostats	Might be emergency heat relay or miscellaneous contacts.
T	Varies, Tan or Gray	Outdoor anticipator reset	Used on GE/Trane/American Standard and some Carrier Products.
L	Varies	Service light	
S1 and S2	Varies	Outdoor unit shut-off	Can save energy by disabling the outdoor unit when the outdoor air temperature is such that it would cause the unit to operate inefficiently.



FCC COMPLIANCE STATEMENT: Complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (i.) this device may not cause harmful interference and (ii.) this device must accept any interference received, including interference that may cause undesired operation.

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LIMITED 2 YEAR WARRANTY AND EXCLUSIONS

Leviton warrants to the original consumer purchaser and not for the benefit of anyone else that this product at the time of its sale by Leviton is free of defects in materials and workmanship under normal and proper use for two years from the purchase date. Leviton's only obligation is to correct such defects by repair or replacement, at its option, if within such two year period the product is returned prepaid, with proof of purchase date, and a description of the problem to **Leviton Manufacturing Co., Inc., Att: Quality Assurance Department, 201 North Service Road, Melville, New York 11747**. This warranty excludes and there is disclaimed liability for labor for removal of this product or reinstallation. This warranty is void if this product is installed improperly or in an improper environment, overloaded, misused, opened, abused, or altered in any manner, or is not used under normal operating conditions or not in accordance with any labels or instructions. **There are no other or implied warranties of any kind, including merchantability and fitness for a particular purpose**, but if any implied warranty is required by the applicable jurisdiction, the duration of any such implied warranty, including merchantability and fitness for a particular purpose, is limited to two years. **Leviton is not liable for incidental, indirect, special, or consequential damages, including without limitation, damage to, or loss of use of, any equipment, lost sales or profits or delay or failure to perform this warranty obligation.** The remedies provided herein are the exclusive remedies under this warranty, whether based on contract, tort or otherwise.

For Technical Assistance Call: 1-800-824-3005 (U.S.A. Only) www.leviton.com