

Installation Guide

Model CH-THSTAT-W

This thermostat is compatible with most HVAC systems, including the following:

- 24VAC systems **Note: requires both the 24R and 24C (common) wires**
- Standard gas/oil/electric heating systems
 - 1 stage heating and cooling
 - 2 stage heating and cooling
- Heat Pump systems:
 - 1 stage heating and cooling
 - 2 stage heating and cooling
 - 2nd or 3rd stage Auxiliary heating (heat strips)
- **Do NOT use for line voltage controls (120/240VAC)**

Stop! Before removing your existing thermostat be sure to label the wires with the wiring labels included. Label the wires as they were **connected to the old thermostat terminals** and record them below.

We strongly recommend you **take a picture of your existing thermostat wiring** connections. This will enable you to reconnect your old thermostat if you encounter a problem installing the CH-THSTAT-W and will assist in trouble shooting the installation, if needed.

CAUTION: The typical wire colors noted below may be different from your installation.

Standard HVAC System Wiring

Thermostat Terminal Marking	Meaning	Typical Wire Color	Record the old thermostat wire color connected to this terminal here
C	24VAC Common	Blue	
R (or RH)	24VAC Return (heating system)	Red	
G	Fan	Green	
W or W1	Heat stage 1	White	
Y or Y1	Cool stage 1	Yellow	
W2	Heat stage 2	Orange	
Y2	Cool stage 2	Black	

Heat Pump HVAC System Wiring

Thermostat Terminal Marking	Meaning	Typical Wire Color	Record the old thermostat wire color connected to this terminal here
C	24VAC Common	Blue	
R	24VAC Return	Red	
G	Fan	Green	
W or W1	Aux Heat	White	
Y or Y1	Compressor stage 1	Yellow	
O (or B*)	Change Over Valve	Orange (brown*)	
Y2	Compressor stage 2	Black	

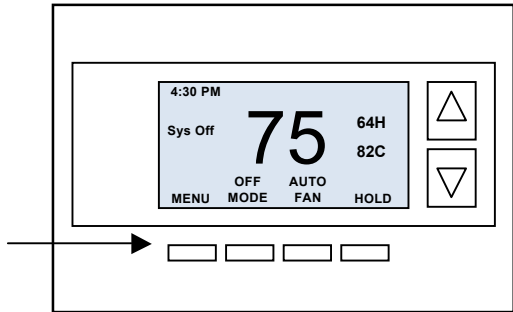
* if you have a terminal marked "B" with a brown wire attached to it, that means you have a changeover (C/O) with heating type heat pump system. Be sure to set the change over type in the **Installer Settings** menu to **C/O Type: w/Heat**. Otherwise leave it set to **w/Cool**.

INSTALLATION

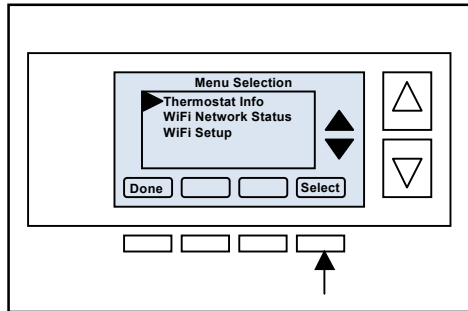
IMPORTANT! You must set the HVAC System type before operating the thermostat.

After the thermostat is installed and powered up, check and set the HVAC system configuration setup as needed. Follow the steps below to select the correct HVAC system setup.

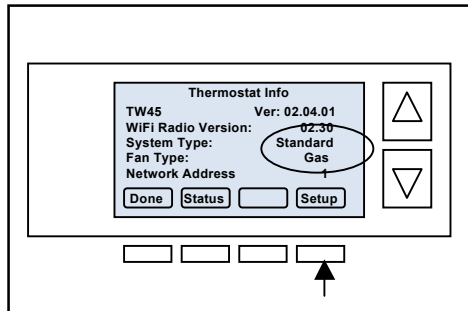
Press the MENU button to go to the main menu screen



Scroll down to the Thermostat Info using down arrow button. Press the SELECT button



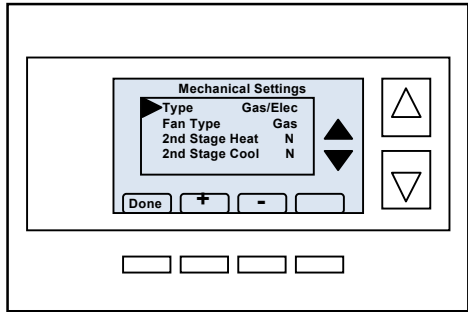
Thermostat Info Screen



Note the System Type displayed here.
The default HVAC type is Standard Gas (single stage)
If this is the correct system type, no further setup is required.
Press Done to exit.

If this is not the correct system type, **press and HOLD** the SETUP button to go to the Mechanical Settings screen.

Mechanical Settings Screen



If HVAC system is a Standard Gas or Electric heat system:

- Set the Type: Standard Gas/Electric systems or HP systems
- Set the Fan Type: Gas or Electric Heat
- Set 2nd Stage Heat: Yes or No (does the system have 2 stage heating)
- Set 2nd Stage Cool: Yes or No (does the system have 2 stage cooling)

If HVAC system is a Heatpump system:

- Set the Type to Heatpump
- Set the C/O Type: Changeover or reversing valve
 - w/Cool = changeover with Cool (default/typical)
 - w/Heat = changeover with Heat
- Set 2nd Stage Heat: Yes or No (does the system have 2 stage heating)
- Set Aux Heat: Yes or No (does the system have auxiliary heating – heat strips)
- Set 2nd Stage Cool: Yes or No (does the system have 2 stage cooling)

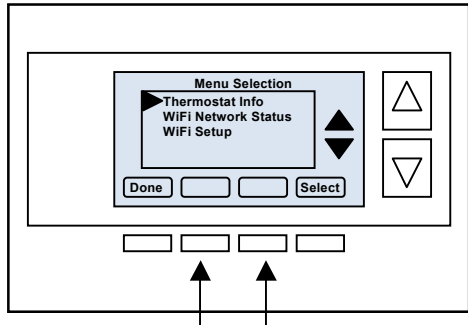
INSTALLER SETTINGS

In addition to the HVAC System Setup, there are other settings of the thermostat that can be configured. These settings are intended for use by certified HVAC installation technicians and are not intended for user changes.

Installer Settings Menu

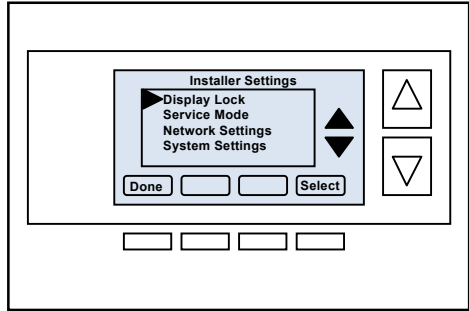
To access the Installer Settings Menu,
Press the Menu button on the main thermostat page.

In the **Main Menu screen**,
Press and hold the two middle buttons
until the Installer Settings Menu appears.



Press and hold two middle buttons to enter
the Installer Settings screen

Installer Settings screen



Installer Settings Menu items

Display Lock

Range: Y or N

Default: N

Y = Display LOCKED

N = Display unlocked

Allows you to lock or unlock the thermostat buttons.

When the buttons are locked, you can still access the main menu, but you will not be allowed to select any menu options.

The Installer Settings hidden button operation is always operational, allowing you to return to this screen and turn Display Lock off.

Service Mode

Test Mode

Range: Y or N

Default: N

Y= Test mode on. Reduces all delays to 10 sec for quicker system testing

N= Test mode off. Normal system delays

CAUTION: in test mode all system safety delays are shortened. Disconnect Y1 or Y2 compressor outputs if using test mode on a live system.

Network Settings Submenu: Shows WiFi settings. Same as in the Main Menu selection. See Operations Manual

System Settings Submenu: Sets the HVAC operational settings below

Mechanical Settings Submenu: Sets HVAC system type and configuration. Same as SETUP menu.

Type Range: Gas/Elec or Heat pump Default: Gas/Elec
Selects HVAC type, Gas/Electric or Heat pump

Fan Type Range: Gas or Elec Default: Gas
Selects the Fan type if system is Gas or Electric

C/O Type Range: w/Cool or w/Heat Default: w/Cool
Selects the Heat Pump Changeover Valve type

2nd Stage Heat Range: Y or N Default: N
Enables the 2nd Stage Heat operation

Aux Heat (HP) Range: Y or N Default: Y
Enables the Auxiliary Heat operation.
Typically the Aux Heat will be heat-strips in a Heat Pump system

2nd Stage Cool Range: Y or N Default: N
Enables the 2nd Stage Cool operation

Schedule Enable Range: Y or N Default: Y

When enabled, the local thermostats scheduler function is enabled.

Recovery enable Range: Y or N Default: N

For Heat Pump Systems. Intelligent setback recovery is an automatic advance start of heating to allow the system to be at setpoint by the schedule time, without the use of Aux heating.

Delta Settings : The Delta T Setting is the delta, or difference between, the setpoint and current temp for determining when a heat or cool call comes on.

The "delta" is the number of degrees away from setpoint.

H/C Delta Range: 3 - 15 degrees. Default: 3F (1C)

Sets the minimum separation between heating and cooling setpoints.

Attempts to lower the cooling below the heating setpoint by this amount will PUSH the heating setpoint down to maintain this separation.

Same for setting the heating setpoint above the cooling setpoint, it will PUSH the cooling setpoint up to maintain this separation.

Fan Purge Range: 0, 30-120 seconds Default: 0 (off)

Heating Delta Stage 1 ON Range: 1 to 8 degrees Default: 1

Sets the delta from setpoint that stage 1 heating starts.

Heating Delta Stage 1 OFF Range: 0 to 8 degrees Default: 0

Sets the delta from setpoint that stage 1 heating stops.

Stage 1 turns off at setpoint + Delta Stage 1.

Heating Delta Stage 2 ON Range: 1 to 8 degrees Default: 2

Sets the delta from setpoint that stage 2 heating starts.

Heating Delta Stage 2 OFF Range: 0 to 8 degrees Default: 0

Sets the delta from setpoint that stage 2 heating stops.

Stage 2 turns off at setpoint + Delta Stage 2.

Heating Delta Stage 3 ON Range: 1 to 8 degrees Default: 3

Sets the delta from setpoint that stage 3 heating starts.

Heating Delta Stage 3 OFF Range: 0 to 8 degrees Default: 0

Sets the delta from setpoint that stage 3 heating stops.

Stage 3 turns off at setpoint + Delta Stage 3.

Cooling Delta Stage 1 ON Range: 1 to 8 degrees Default: 1

Sets the delta from setpoint that stage 1 cooling starts.

Cooling Delta Stage 1 OFF Range: 0 to 8 degrees Default: 0

Sets the delta from setpoint that stage 1 Cooling stops.

Stage 1 turns off at setpoint - Delta Stage 1

Cooling Delta Stage 2 ON Range: 1 to 8 degrees Default: 2

Sets the delta from setpoint that stage 2 cooling starts.

Cooling Delta Stage 2 OFF Range: 0 to 8 degrees Default: 0

Sets the delta from setpoint that stage 2 Cooling stops.

Stage 2 turns off at setpoint -Delta Stage 2.

Max Heat SP Range: 40F to 109F (4C-43C) Default: 90F (32C)
Sets the maximum heating setpoint value.
Will not ramp or accept setpoints higher than this maximum.

Min Cool SP Range: 44F to 113F (6C-45C) Default: 60F (15C)
Sets the minimum cooling setpoint value.
Will not ramp or accept setpoints lower than this minimum.

Minimum Run Time (MRT) Range: 1- 9 Minutes Default: 3
Sets the minimum run time before a heating/cooling cycle can turn off.
Sets heating/cooling cycle time. Prevents rapid cycling.

Minimum Off Time (MOT) Range: 5-9 Minutes Default: 5
Sets the minimum off time before another heating/cooling cycle can begin.
Provides compressor short cycle protection.

Fan Cyclers

The fan cycler function cycles the HVAC system fan for an ON period followed by an Off period continuously. Used to provide minimum air ventilation requirements.

When the Fan ON time is set to a value greater than 0, an additional "Cycler" FAN mode is present when pressing the FAN button.

Fan ON Time	Range: 0-120 minutes	Default: 0 (=OFF)
Fan OFF Time	Range: 10-120 minutes	Default: 10

Remote Sensors Submenu Sensor Setup

RS1 Type	A curve, Type 2, Type 3	Default: Type 3
RS2 Type	Range: A curve, Type 2, Type 3	Default: Type 3
RS2 Location	Range: IN (indoors), OUT (outdoors)	Default: IN

Restore Defaults Range: Yes, No Default: No
Restores all settings to factory defaults.
Press Yes to restore defaults,
Press No to exit and not restore defaults

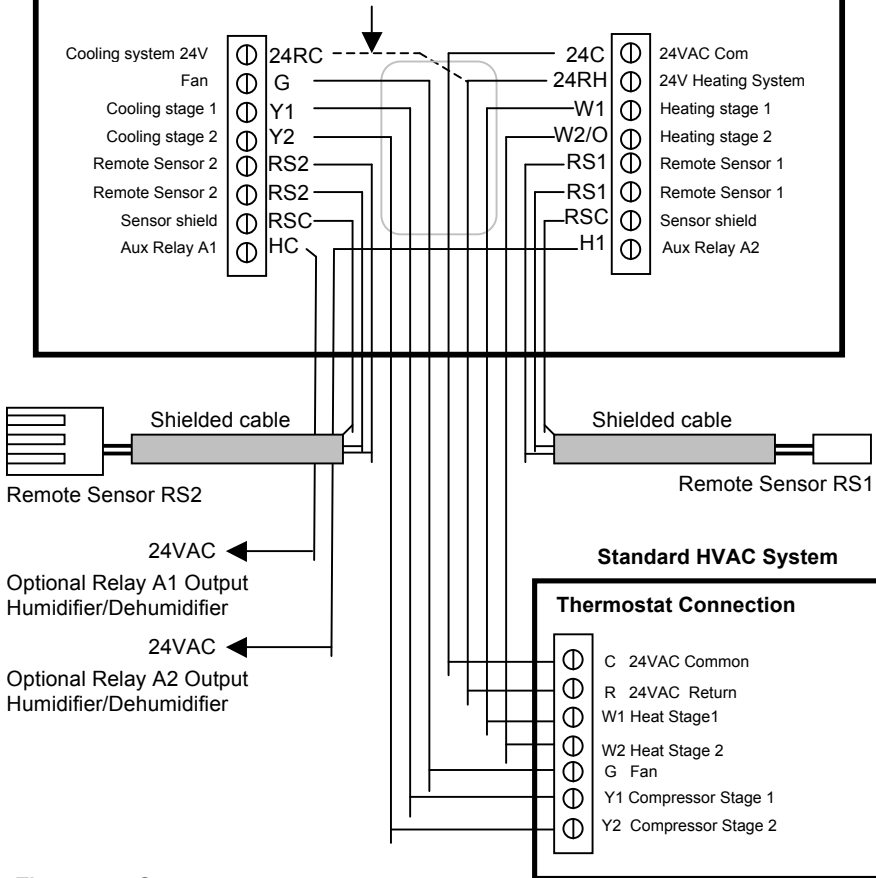
Installer Settings Summary

Setting	Range	Default	
Display Lock	Y or N	N	Locks out front buttons
Service Mode Submenu			
Test Mode	Y or N	N	Reduces delays for testing
System Settings Submenu			
Mechanical Settings Submenu			
Sys Type	Std or HP	Std	
Fan Type	Gas or Elec	Gas	
C/O Type	w/Heat or w/Cool	w/Cool	
2 nd Stage Heat	Y or N	N	
Aux Heat	Y or N	Y	
2 nd Stage Cool	Y or N	N	
H/C Delta	3 – 15 deg	3	
Heat Delta Stage 1 On	1 – 8	1	
Heat Delta Stage 1 Off	0 – 8	0	
Heat Delta Stage 2 On	1 – 8	2	
Heat Delta Stage 2 Off	0 – 8	0	
Heat Delta Stage 3 On	1 – 8	3	
Heat Delta Stage 3 Off	0 – 8	0	
Cool Delta Stage 1 On	1 – 8	1	
Cool Delta Stage 1 Off	0 – 8	0	
Cool Delta Stage 2 On	1 – 8	2	
Cool Delta Stage 2 Off	0 – 8	0	
Max Heat SP	40-109F (4-42C)	90F	
Min Cool SP	44-113F (6-45C)	60F	
Min Run Time	1-9 min	3	
Min Off Time	1-9 min	5	
Temp Response	1-6	2	
Fan Cyclers Submenu			
Fan Cyclers ON time	0 – 120 min	0	0 = Fan Cyclers OFF
Fan Cyclers Off Time	10 – 120 min	10	
Restore Defaults	Yes or No	No	Exit = no
USER SETTINGS			
Filter Service Submenu			
Service Interval	Disabled, 100-4000 hrs	300	
Maint Service Submenu			
Maint Interval	Disabled, 100-4000 hrs	3000	
Screen Timeout (to minimized screen)	0, 20-120 sec	0	0 = off , will not timeout
F/C Mode	F or C	F	
Sensor Calibration Submenu	Internal -7 to +7	0	
Backlite/Display Submenu			
Backlight Timeout	0, 20-120	0	0 = backlight off
Backlight On Brightness	0-100%	100%	
Backlight Off Brightness	0-100%	0%	
Contrast	0-20	14	

Standard Gas/Electric HVAC System Wiring

Thermostat back

Optional 24R Connection for single transformer HVAC Systems
RC and RH are jumpered together on thermostat board.
Cut RC/RH jumper JP1 for separate heating & cooling transformers



Thermostat Setup:

Standard Gas/Electric HVAC Systems

To set the HVAC system type, go to the Main Menu *Thermostat Info* screen and *press and hold* the **Setup** button.

- Type.** Set the HVAC System Type: set to **Gas/Elec**
- Fan Type.** Set the HVAC Fan Type:
Set to **Gas** for typical gas furnace (fan is controlled by the furnace)
Set to **Elec** for electric heat (fan call with heat call)
- 2nd Stage Heat.** Enable second stage heating outputs
If you have a single stage heating system, leave this set to **N**
If you have a 2 stage heating system, set to **Y** to enable.
- 2nd Stage Cool.** Enable second stage cooling outputs
If you have a single stage cooling system, leave this set to **N**.
If you have a two stage cooling system, set to **Y** to enable.

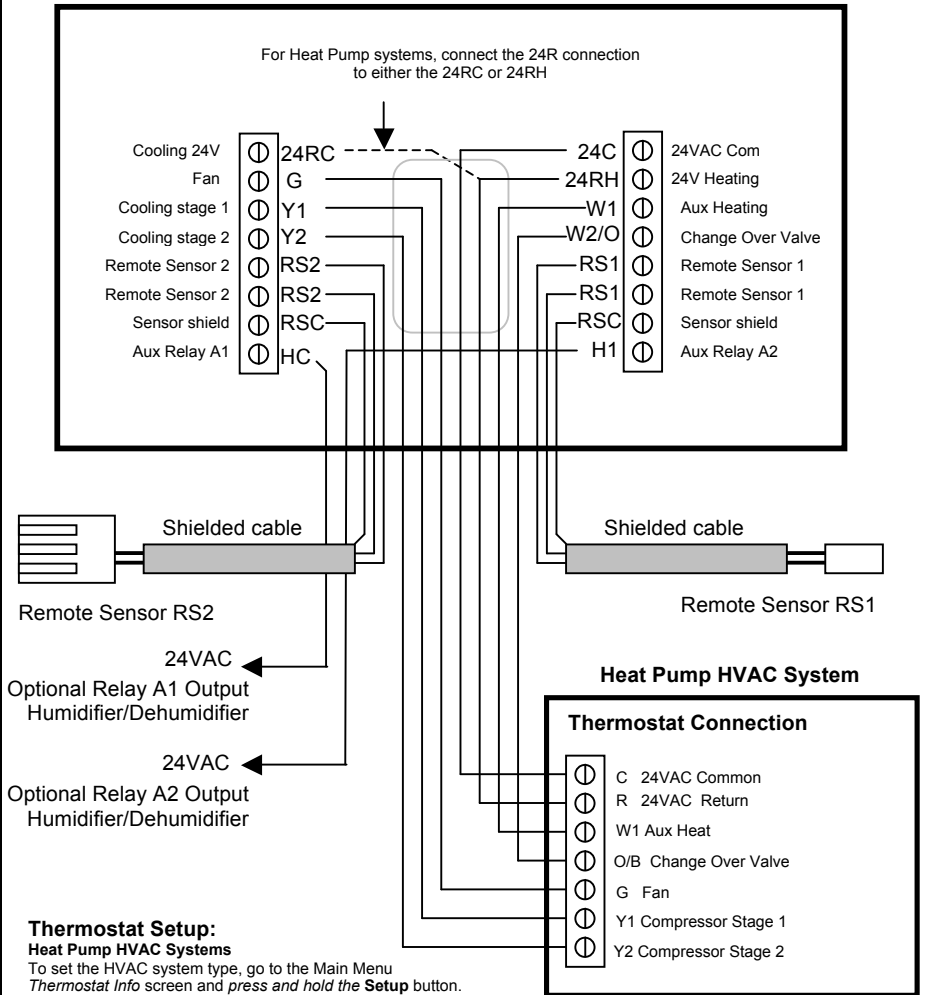
Default Setup:

- HVAC Type: Gas/Elec
- Fan Type: Gas
- 2nd Stage Heat: No
- 2nd Stage Cool: No

No setup required for this configuration

Heat Pump HVAC System Wiring

Thermostat back



Thermostat Setup:

Heat Pump HVAC Systems

To set the HVAC system type, go to the Main Menu *Thermostat Info* screen and *press and hold the Setup* button.

- Type.** Set the HVAC System Type: set to **Heat Pump**
- C/O type.** Change Over (reversing) Valve Type. Heat pumps change from heating to cooling by reversing operation. You must configure the thermostat's changeover valve setting to work correctly with your HVAC system. Check your system information to be sure and note the color of original thermostat wire and the terminal it was connected to. No matter what the old stat connection was (O or B), connect the wire to the thermostat's W2/O terminal. The setting of the C/O Type will set the correct system operation.
For change over with cool systems (Orange wire, O terminal): set **C/O type** to w/cool (most common and default setting)
For change over with heat systems (Brown wire, B terminal): set **C/O type** to w/heat
- 2nd Stage Heat.** Enable second stage heating outputs
If you have a single stage heating system, leave this set to **N**
If you have a 2 stage heating system, set to **Y** to enable.
- Aux Heat (HP).** If you have auxiliary heat strips, set this to **Y** to enable.
- 2nd Stage Cool.** Enable second stage cooling outputs
If you have a single stage cooling system, leave this set to **N**.
If you have a two stage cooling system, set to **Y** to enable.

Note! If you get heating when you expected cooling, change the C/O type to the opposite setting.