

Installation Guide Model TZ45R

Z-Wave Thermostat

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 do the following:

1. **Take a picture** of the original wires and terminal connections
2. Label the wires with the terminal markings on the old thermostat
3. Record old thermostat terminals and the wire color connected to them below

Standard HVAC System Wiring

Terminal Marking	Meaning	Typical Wire Color May be different!!! Take a picture!	Record the old thermostat wire color that was connected to the terminal
C	24VAC Common	Blue	
R	24VAC Return	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	

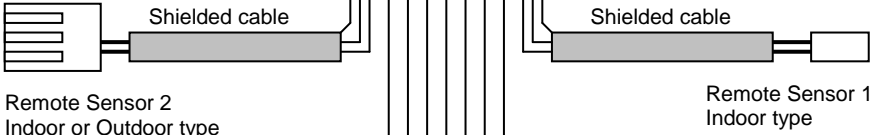
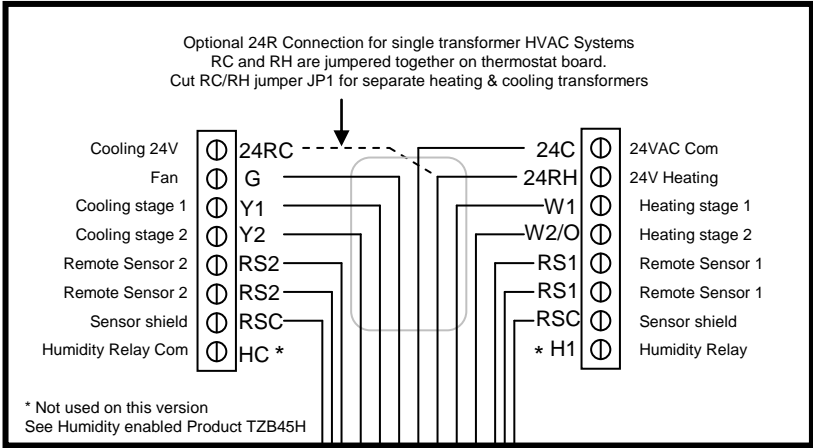
Heat Pump HVAC System Wiring

Terminal Marking	Meaning	Typical Wire Color May be different!!! Take a picture!	Record the old thermostat wire color that was connected to the terminal
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	

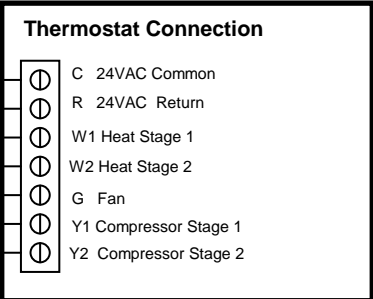
* if you have a terminal marked "B" with a brown wire attached to it, that means you have a changeover (C/O) with heating type heat pump system. Be sure to set the change over type in the **Installer Settings** menu to **C/O Type: w/Heat**. Otherwise leave it set to **w/Cool**.

Standard Gas/Electric HVAC System Wiring

Thermostat back



Standard HVAC System



Thermostat Setup: Standard Gas/Electric HVAC Systems

To set the HVAC system type, go to the *Thermostat Info* screen and press **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)
- C/O type.** Not used for standard systems. Ignore this setting.
- 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).** Not used for standard systems. Ignore this setting
- 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.

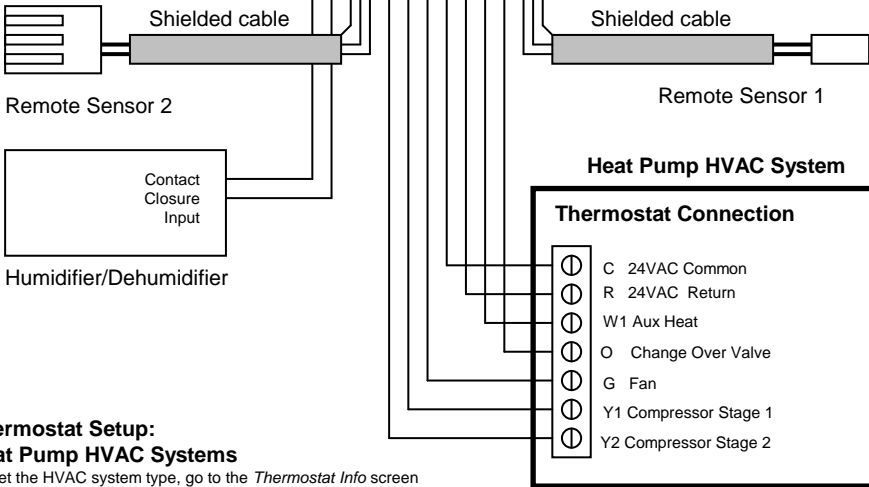
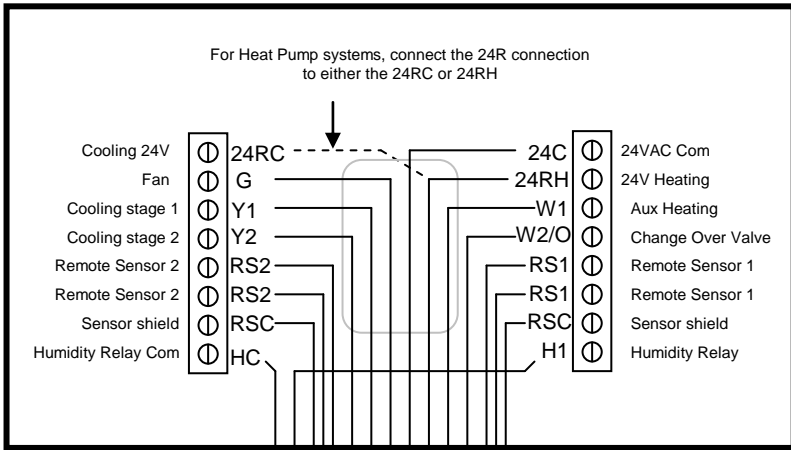
Default Setup:

- Gas/Elec
- Gas Heat
- 1 Stage heating
- 1 Stage cooling

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 *Thermostat Info* screen and press **Setup** button.

1. **Type.** Set the HVAC System Type: set to **Heat Pump**
2. **Fan Type.** Automatically set for heat pump systems. Ignore this setting.
3. **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
4. **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.
5. **Aux Heat (HP).** If you have auxiliary heat strips, set this to **Y** to enable.
6. **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.

INSTALLATION SETUP

Before operating the system, the HVAC System Type must be setup in the Installer Settings/System Settings/Mechanical Settings Menu!

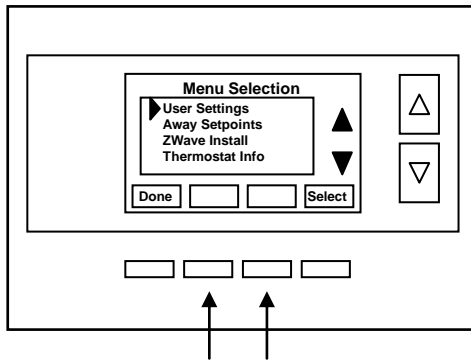
Default Settings: The HVAC System Type is default set for a Gas/Electric system with Gas Heat Fan type. If this matches the HVAC system the thermostat is connected to, then no further setup is required.

If the HVAC system has Electric heat or is a Heat Pump system, then the Mechanical Settings must be changed to match. Go to the Installer Settings Menu to complete the HVAC setup.

Installer Settings Menu

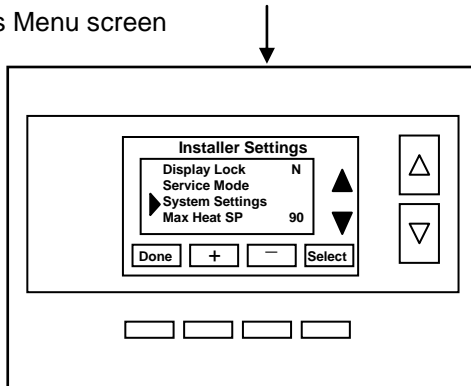
To change the HVAC setup, go to the **Installer Settings Menu**. This is a hidden menu and it can be accessed by pressing the main menu button and when the main Menu Selection screen appears, press and hold the middle two buttons for 5 seconds.

Thermostat Main Menu Selection Screen



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

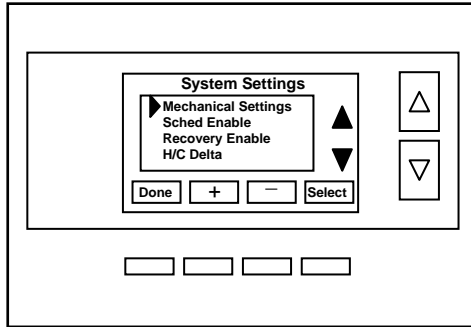
Installer Settings Menu screen



HVAC System Setup

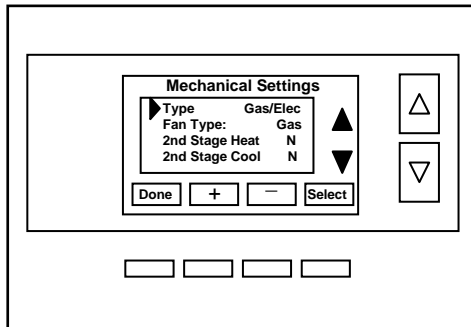
In the Installer Settings main menu, us the down arrow button to scroll down to the System Settings menu item and press Select.

System Settings Menu screen



Select the Mechanical Settings menu item and press Select.

Mechanical Settings Menu Screen



HVAC Setup Settings

Set these settings to match the HVAC system the thermostat is connected to.

Type Selects HVAC type, Gas/Electric or Heat pump (HP)
Options: Gas/Elec or Heat pump Default: Gas/Elec

Fan Type (if Type=Gas/Elec) Selects the heating system Fan type
Options: Gas or Electric (heat) Default: Gas

C/O Type (if Type=HP) Selects the Changeover Valve type for Heat Pump systems
Options: w/Cool or w/Heat Default: w/Cool

For retrofit installations, refer to the existing thermostat connections to help determine correct C/O type setting. If the original system had an orange wire connected to an “O” terminal, then it is a “changeover with cool” system. If there is a brown wire connected to the “B” terminal, then it is a “change over with heat” system. NOTE: if you get cooling when expect heating (or heating when you expect cooling), change the C/O type to the other selection.

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

Aux Heat (if Type=HP) Enables Auxiliary Heat (heat strips) operation.
Options: Y or N Default: Y

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

Other Installer Settings

The Installer Settings Menu includes other HVAC operation settings that can customize the thermostat for the installation. CAUTION: these settings affect HVAC system operation and should only be changed by qualified HVAC service technicians.

Installer Settings Menu Items

Display Lock Options: 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 Options: 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 shorten. Do not operate the system compressor in test mode. Disconnect Y1 or Y2 outputs if using test mode on a live system.

System Settings Submenu: Sets the HVAC operational settings below

Mechanical Settings Submenu: Sets HVAC system type and configuration
See HVAC setup instructions above

Schedule Enable When enabled, the local thermostat’s scheduler function is enabled.
Options: Y or N Default: N

Recovery Enable 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. Options: Y or N Default: N

H/C Delta Sets the minimum separation between heating and cooling setpoints.
Options: 3 - 15 degrees Default: 3 deg F (1 deg C)

Attempts to lower the cooling setpoint below the heating setpoint 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: Fan will continue to run after a call for heating or cooling to purge the conditioned air from the ducts.
Options: 0-120 Default: 0 (=off)

Heating Delta Stage 1 ON Sets the delta from setpoint that stage 1 heating starts.

Options: 1 to 8 degrees Default: 1

Heating Delta Stage 1 OFF Sets the delta from setpoint that stage 1 heating stops. Stage 1 turns off at setpoint + Delta Stage 1.
Options: 0 to 8 degrees Default: 0

Heating Delta Stage 2 ON Sets the delta from setpoint that stage 2 heating starts.
Options: 1 to 8 degrees Default: 2

Heating Delta Stage 2 OFF Sets the delta from setpoint that stage 2 heating stops. Stage 2 turns off at setpoint + Delta Stage 2.
Options: 0 to 8 degrees Default: 0

Heating Delta Stage 3 ON Sets the delta from setpoint that stage 3 heating starts.
Option: 1 to 8 degrees Default: 3

Heating Delta Stage 3 OFF Sets the delta from setpoint that stage 3 heating stops. Stage 3 turns off at setpoint + Delta Stage 3.
Option: 0 to 8 degrees Default: 0

Cooling Delta Stage 1 ON Sets the delta from setpoint that stage 1 cooling starts.
Options: 1 to 8 degrees Default: 1

Cooling Delta Stage 1 OFF Sets the delta from setpoint that stage 1 Cooling stops. Stage 1 turns off at setpoint - Delta Stage 1
Options: 0 to 8 degrees Default: 0

Cooling Delta Stage 2 ON Sets the delta from setpoint that stage 2 cooling starts.
Options: 1 to 8 degrees Default: 2

Cooling Delta Stage 2 OFF Sets the delta from setpoint that stage 2 Cooling stops. Stage 2 turns off at setpoint -Delta Stage 2.
Options: 0 to 8 degrees Default: 0

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

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

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

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

Fan Cyclers

The fan cyclers 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 Options: 0-120 minutes Default: 0 (=OFF)
Fan OFF Time Options: 10-120 minutes Default: 10

Remote Sensors

RS1 Type Specifies the thermistor sensor temperature curve type
Options: Curve A, Type 2, Type 3 Default: Type 3

RS2 Type Specifies the thermistor sensor temperature curve type
Options: Curve A, Type 2, Type 3 Default: Type 3

RS2 Location Selects RS2 installed location as indoor sensor or outdoor sensor
Options: IN (indoor) or OUT (outdoor) Default: IN

R1 Node ID Selects the node ID for a remote Z-Wave temp sensor to be used as RS1
Options: 0-252 Default: 0 (=not used)

R2 Node ID Selects the node ID for a remote Z-Wave temp sensor to be used as RS2
Options: 0-252 Default: 0 (=not used)

Restore Defaults Restores all settings to factory defaults.
Options: Yes, No Default: No

Press Yes to restore defaults,
Press No to exit and not restore defaults

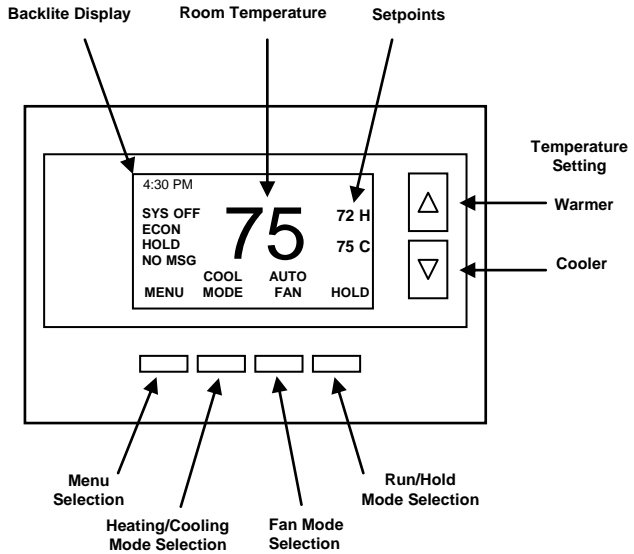
Installer Settings Summary

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	
Remote Sensors Submenu			
RS1 Type (curve type)	Curve A, Type 2, Type 3	Type 3	
RS2 Type (curve type)	Curve A, Type 2, Type 3	Type 3	
RS2 Location (Indoors or Outdoors)	In, Out	In	
R1 Node ID (Zwave node address)	0-252	0	
R2 Node ID (Zwave node address)	0-252	0	
Restore Defaults (factory 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	

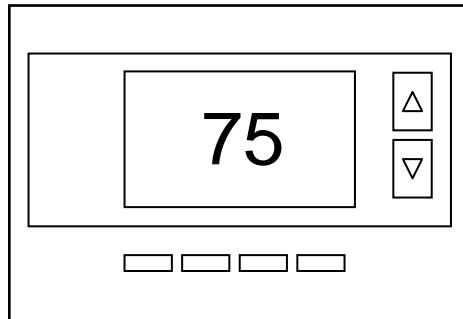
Operation Guide Model TZ45R

Z-Wave Thermostat

Main Thermostat Screen

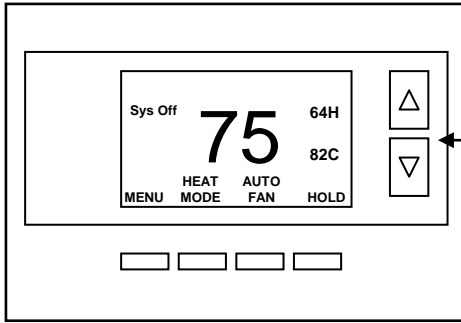


Minimized Display



Press any button to return to the main thermostat screen

Setting the heating or cooling temperature setpoint

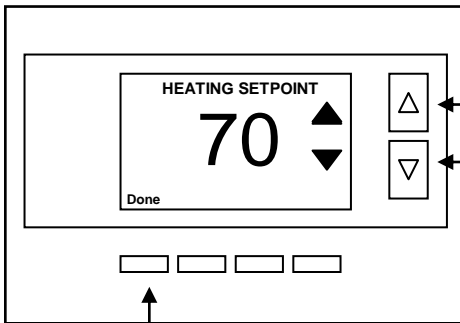


Press a button to go to the setpoint change screen

Setpoint change screen



Press the up or down arrow buttons to set the desired temperature setpoint



Raise Temperature

Lower Temperature

Pressing the up or down buttons will increment the setpoint 1 degree. Press and hold the button to ramp the setpoint.

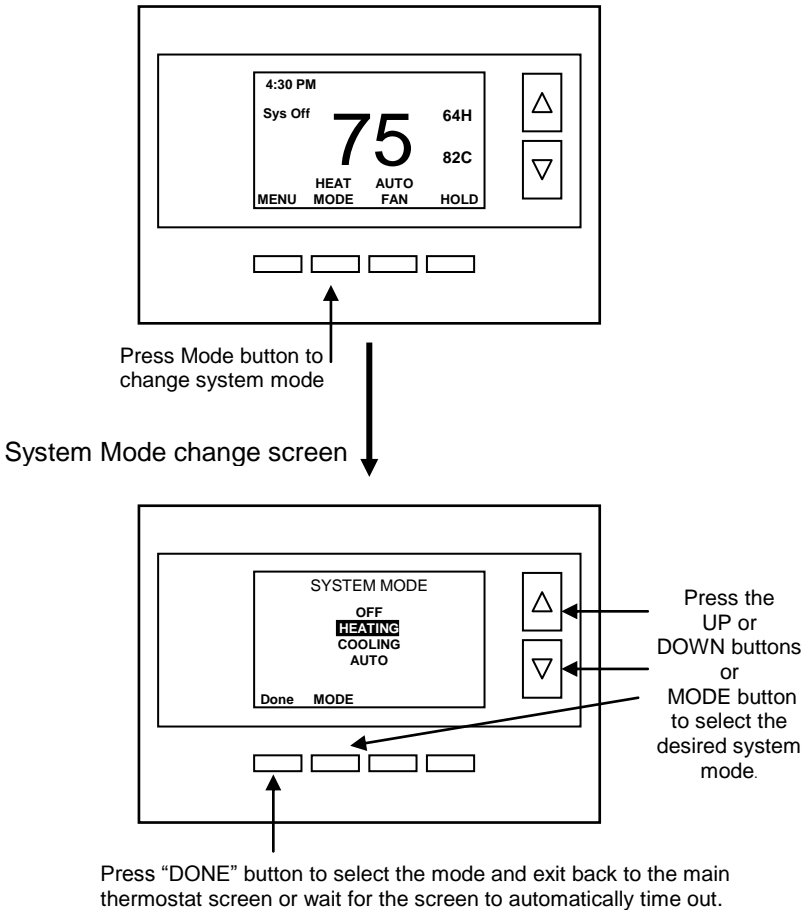
Press "DONE" button to set the setpoint and exit back to the main thermostat screen or wait for the screen to automatically time out.

! *If the System Mode is OFF, pressing either the Up or Down buttons will take you to the System Mode screen. You must first set an operating mode before you can set or change the setpoint.*

! *To change the Heat Setpoint you must be in the Heating mode, to change the Cool Setpoint you must be in the Cooling mode. If you are in Auto mode, the mode of the last system call will be the setpoint screen displayed.*

Setpoint Push: Note that you cannot lower the cooling setpoint below the heating setpoint. The thermostat will "push" the heating setpoint lower if you try to lower the cooling setpoint below the heating setpoint. It maintains a 3 degree separation between the heating and cooling setpoint. The same is true for raising the heating setpoint above the cooling setpoint. Again the thermostat will "push" the cooling setpoint up to maintain the 3 degree separation.

Setting the System Mode: Off, Heat, Cool, Auto



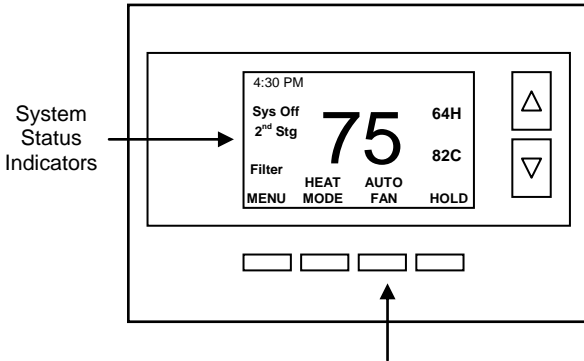
System Modes

- **OFF:** System is off. No heating or cooling will come on. If system was on, it will turn off immediately.
- **HEATING:** Only heating will occur.
- **COOLING:** Only cooling will occur.
- **AUTO:** Heating or cooling will come on according to the heating and cooling setpoints. The system will automatically switch between heating and cooling modes as needed to maintain the setpoints.

Special Heat Pump Mode: Emergency Heat

- **EHEAT:** An additional system mode, "EHEAT" for Emergency Heat will be displayed if the HVAC system type is set to Heat Pump. If there is a compressor failure with the Heat Pump system, setting the mode to EHEAT will allow the supplemental Aux heat to come on first whenever there is a call for heating. It also disables the compressor output to prevent further damage to the HVAC system.

Setting Fan Mode and System Status Indicators



Press the Fan button to change the Fan mode

- AUTO FAN: Fan automatically operated by the HVAC system.
- FAN ON: Manual Fan mode. Fan stays on until mode is changed back to Auto.

Optional Fan Mode

Fan Cycler. If the Fan Cycler feature is enabled in the Installer Setup, the additional fan mode "Cycle" will be shown in the Fan Mode menu. This mode cycles the fan on and off continuously for fresh air ventilation according to the settings in the Installer Setup.

System Status Indicators

When the main thermostat screen is displayed, the on-screen labels indicate the following.

System Operation mode indicator

"SYS OFF"¹ displayed > System is OFF

"SYS MOT"¹ displayed > System is OFF and Minimum Off Time (MOT) delay On is active

"HEAT ON" displayed > System is ON and heating

"COOL ON" displayed > System is ON and cooling

"HEAT MRT"² displayed > System is ON and heating. Minimum Run Time (MRT) delay off is active.

"COOL MRT" displayed > System is ON and cooling. Minimum Run Time (MRT) delay off is active.

Staging display

"2nd Stg" displayed > Stage 2 heating or cooling is ON

"Aux Heat" displayed > Stage 3 heating is ON

For Heat Pump systems only: "EHEAT" > emergency heat mode active

Home/Away display

Home mode is active (current setpoints are being used)

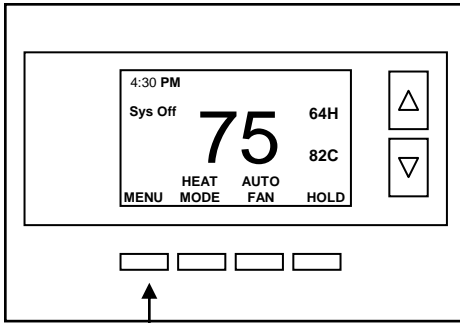
Away setback mode is active (setback setpoints are being used)

System Alerts

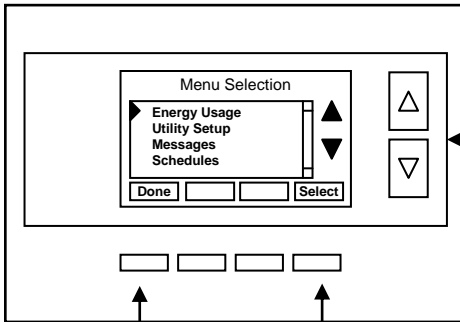
Alert Text displayed > Specific alert text (Filter or Maintenance Timer)

Notes 1 and 2: See MOT and MRT descriptions on page 18

Menu Selection



Press Menu button to go to the main menu screen



Use the UP/DOWN buttons to select the desired menu item

Press DONE to go back to the main thermostat screen

Press SELECT to go to the menu item screen

Main Menu Items

- Energy Usage > Enabled for In-Home Display versions
- Utility Setup > Enabled for In-Home Display versions
- Messages > Enabled for In-Home Display versions
- Schedules > Optional, used to view and set programmable schedules
- User Settings > set various user preferences
- Away Setpoints > show and set the heating and cooling setback setpoints
- ZWave Install > ZWave installation
- Thermostat Info > displays thermostat setup info

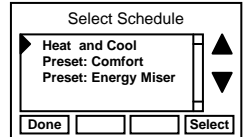
Schedules is an optional menu item. It will only show up in the menu list if "Schedules" is enabled in the Installer settings for the thermostat. Provides for local schedule control. The Schedules Screen allows you to review and set the setback schedule for the thermostat. The thermostat has a 4 x 7 schedule. Four times a day can be selected for changes to the heating and cooling setpoints. Each day of the week can have a different schedule. Groups of days can be copied with the same schedule. When the thermostat is set to "Run" mode, the schedule will be executed daily, with the setpoints being changed

as per that days schedule stored in the thermostat. "Hold" mode stops schedule operation and holds the current setpoints until changed manually or by network commands.

The Schedules Screen gives you the option of setting a custom setback schedule or to load one of two preset schedules.

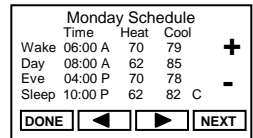
Menu Options

- **Heat and Cool:** You can change the individual day/hour and setpoints for the Heating and Cooling schedule by selecting this menu item.
- **Preset: Comfort:** This is a preset schedule with mild setbacks. Select this menu item to load the Comfort schedule into the thermostat. Confirmation screen will be displayed for Yes/No entry.
- **Preset: EnergyMiser:** This is a preset schedule with deeper setbacks. Select this menu item to load the EnergyMiser schedule into the thermostat. Confirmation screen will be displayed for Yes/No entry.



Day Schedule Screen

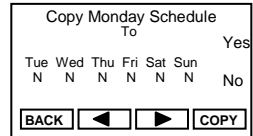
When you select the Heat and Cool Schedule menu item, the "day" schedule programming screen opens and the schedule for current day will be displayed. Use the scroll buttons to highlight the data to be modified. Once the data has been highlighted, use the +/- buttons to change the value of the data.



To copy a days schedule to another day or group of days, move the cursor to "C" on the bottom right of the schedule screen. When you highlight the "c", the button below will become "Copy". Press this button to change to the Copy Schedule Screen.

Copy Schedule Screen

The Copy Schedule screen is a sub screen of the Schedule screen. The Copy Schedule screen allows you to copy a day's schedule to another day or group of days.



First select the day to be copied in the Schedule screen. Scroll to the "c" at the bottom of the Schedule screen to highlight it. The "Next" button will change to the "Copy" button. Press the "Copy" button to open the Copy Schedule screen.

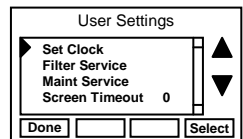
Scroll through the days and select the days you want to copy the schedule to by setting the "N" under each day to "Y" by using the Yes/No buttons.

After selecting all the days desired, press the "COPY" button.

Exit the Copy Schedule screen with the "DONE" button.

User Settings Menu Items

- Set Clock > go to the clock setting screen
- Filter Service > go to the filter timer setup screen
- Maint Service > go to the maintenance timer setup screen
- Screen Timeout > sets the time in seconds to switch to the minimized screen
- F/C Settings > go to the F/C mode selection screen
- Sensor Calibration > go to the sensor calibration screen
- Backlight/Display > go to the backlight and display setup screen



Set Clock: The Set Clock screen allows you to set the Thermostat's internal clock.

To set the Time and Date, move the cursor with the navigation arrows until the data you want to change is highlighted.

Set Clock		
Time	08:00 AM	+
Date	01/01/11	
Day	Mon	-
[Back] [Left Arrow] [Right Arrow] [Set]		

Using the + and – buttons to increment or decrement the data to the desired setting.

When finished, press the **SET** button to return to the Main Menu screen or wait for screen to timeout.

! *If the clock has been reset by an extended power outage, the Clock display on the thermostat screen will be blinking. Pressing the MENU button will take you directly to this screen to set the clock.*

Filter Service: Go to the Filter Service Screen. Sets/resets the filter timer/alert. Shows filter runtime in hours and the service interval alert in hours (typically 300 hrs) Change the service interval with the +/- buttons. Reset the service alert after you have changed the filter.

Maint Service: Go to the Maintenance Service Screen. Sets/resets the maintenance timer/alert.

The Maintenance Service screen will show the accumulated Heat and Cool runtime hours as well as the Service Interval that will be used to trigger a Maintenance alert.

Service interval is 3000 hours. Use the +/- buttons to adjust service interval. Press reset to clear the service alert and reset the runtimes to zero.

When the combined HEAT and COOL Runtime hours equals the Service Interval hours, a "Maint" message will be displayed as a reminder that the HVAC system may require periodic maintenance. Pressing the Menu button will take you to the Filter Service screen. The Reset button can be pressed and the HEAT and COOL Runtime values will be reset to zero.

Screen Timeout: Minimized Screen. Set the display timeout time in seconds. Options are 0 or 15 to 120 (default set to 0 seconds). This is the time before the main thermostat screen reverts to the minimized temperature only display screen, after the last button press. The Minimized Screen feature is disabled by setting this time to "0".

! *Any button press will restore the main thermostat screen display.*

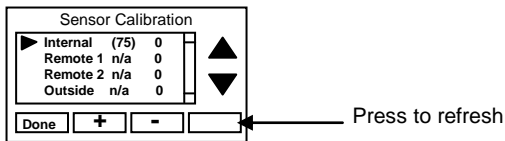
F/C Settings: Go to the F/C Settings Screen. Select which temperature display mode you desire, Fahrenheit (F) or Celsius (C).

Sensor Calibration: Go to the Sensor Calibration Screen. This screen allows you to adjust the calibration of the internal and external sensors. You can change the temperature calibration by +/- 7 degrees using the + and – buttons

When the Sensor Calibration screen is selected it will show the current temperature being displayed on screen and the current number of degrees of offset being applied (typically 0). If the sensor's actual temp is (75) with 0 degrees of offset and you want it to display 76, then press "+" to add 1 deg and it will indicate (76) in the display with 1 deg offset.

! *You can refresh the info on this screen by pressing the right hand (blank) button.*

When you close this screen, it may take a few seconds for the temperature displayed on the main thermostat screen to update to the new temperature selected.



Backlite/Display: Go to the Backlite/Display settings screen. This menu allows you to set the backlight timeout period and adjust the display contrast.

Backlite Timeout: Sets the time from last button press that the backlite will timeout and turn off. The timeout value is adjustable from 0 or 20 to 120 seconds. If set to "0", the Backlite will always be ON. If set in the range of 20 to 120 seconds, the Backlite will turn OFF after the selected time expires.

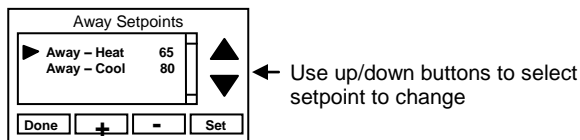
ON Level: Sets the backlight brightness when it is on. Adjustable from 0 to 100% in 5% steps. Screen will change brightness as you adjust setting.

OFF Level: Sets the backlight brightness when it is off. Adjustable from 0 to 100% in 5% steps. Can be 0% = off or a low level for night viewing.

Contrast: Sets the contrast level of the LCD display, adjustable from 0 to 20. Use this control to adjust the sharpness of the display. Too light and the display looks faded, too dark and dark lines will appear in the display. Typically 10-15 is a good setting. Adjust as needed.

Away Setpoints

Away setpoints are used when the thermostat is set to the setback or away mode.



↑
Press DONE to store the setting and exit back to the main menu

↑ Use +/- buttons to increase or decrease the temperature

ZWave Install

This menu item allows you to install or uninstall the thermostat into the ZWave network. Follow the instructions in the ZWave Installation section.

Thermostat Info

The Thermostat Info screen displays the current configuration of the thermostat. This information is useful for quick check of firmware versions and HVAC system setup. It also shows the ZWave network settings.

Thermostat information displayed is:

- **Thermostat** - Model and firmware version number.
- **Z-Wave Settings** – ZWave Firmware version, ZWave Node ID, ZWave Home ID
- **System Type** - Standard or Heat Pump HVAC system
- **Fan Type** – if HVAC type = Standard: Gas or Elect
OR
- **Changeover** – if HVAC type = Heat Pump: Changeover with cool or changeover with heat.

Thermostat Info Screen

Thermostat Info			
TZ45R	Ver 02.02.29		
ZVER: 2.16	ZNID: 001		
ZHID: 00.00.07.76			
System Type:	Standard		
Fan Type:	Gas		
Done	Status		Setup

Press and Hold **Setup** button to go to the HVAC system setup screen



Setup Button (not labeled on screen)

To setup the thermostat to work with your HVAC system, press and hold the “Setup” button. This will take you to the installation setup screen. See installation instructions for proper settings.

Status Button (not labeled on screen)

Press and hold this button. A system status screen will show the output status of the thermostat relays.

Done Button

Press Done to exit the thermostat Info screen back to the main menu.

Thermostat Operation

Minimum Run Time (MRT)

The thermostat has a Minimum Run Time after the start of any heating or cooling call. This minimum run time assures even heating and cooling cycles. The MRT delay will keep the system on even if reaches setpoint or you change the setpoint to a temperature that would satisfy the call, until the MRT expires. Changing the Mode to OFF will cancel the MRT and the system will turn off immediately. The MRT can be adjusted in the Installer Settings menu of the thermostat.

Note: The MRT status is shown in the thermostat System Status on-screen labels.

Minimum Off Time (MOT)

The thermostat has a Minimum Off Time after any heating or cooling call is finished. This delay prevents rapid heating/cooling cycles and also provides “short cycle protection” for compressor calls. This delay may be noticeable when you change a setpoint and it does not respond immediately due to another call that has recently completed and the MOT delay timer is preventing the system from restarting. The MOT delay time can be adjusted in the Installer Settings menu of the thermostat. There is a minimum of 5 minutes delay to assure compressor protection.

Note: The MOT status is shown in the thermostat System Status on-screen labels.

Remote Sensors

The thermostat has two remote temperature sensor inputs.

Remote Sensor RS1. When connected, the thermostat will use the RS1 remote sensor instead of the internal sensor. Temperature displayed will be the RS1 temperature.

Remote Sensor RS2. Selectable Indoor or Outdoor Sensor type. RS2 can be selected to be an indoor remote sensor or an outdoor remote sensor in the Installer Settings Remote Sensors menu item.

RS2 set to Indoor (default setting). When set to Indoor sensor type, RS2 is an averaging sensor that is averaged with the internal thermostat temperature sensor. If RS1 is also attached, RS2 will be averaged with the RS1 sensor instead (since it replaces the internal sensor).

RS2 set to Outdoor. When set to Outdoor sensor type, RS2 will be used to display outdoor temperature on the thermostat.

Remote sensor configurations

Remote Sensors attached	Sensors Used				Sensor Function
	Internal	RS1	RS2 Type IN	RS2 Type OUT	
None	X				Use internal sensor for room temperature
RS1		X			Use RS1 sensor for room temperature. Internal sensor not used
RS2	X		X		Average internal sensor with RS2 sensor and use the average for room temperature
RS1 and RS2		X	X		Average RS1 and RS2 sensors and use the average for room temperature
RS2	X			X	Internal sensor used for room temperature RS2 sensor used for outside temperature
RS1 and RS2		X		X	RS1 sensor used for room temperature RS2 sensor used for outside temp temperature

Z-Wave Remote Sensors

Z-Wave remote sensors can also be used for remote thermostat sensors. When Z-Wave remote sensors are installed on the same Z-Wave network as the thermostat, their node IDs can be linked to the thermostat as either RS1 or RS2 remote sensors. Note: Do not attach both hardwired remote sensors and Z-Wave remote sensors at the same time.

In the Installer Settings Remote Sensor menu, set the Z-Wave network node ID for the Z-Wave remote sensor that is to be used for either the RS1 or RS2 remote sensor. The thermostat will use the Z-Wave remote sensor temperatures the same as if it was hardwired to the RS1 or RS2 terminals. The function of the thermostat with a Z-Wave remote sensor is identical to the RS1/RS2 usage shown above.

Z-Wave® Installation

Z-Wave controllers from various manufacturers may support the Z-Wave Thermostat General V2 Device class used by the RCS Z-WAVE Thermostat. The following procedure will allow the thermostat to be added to a Z-Wave network.

General Programming Procedure (for controllers supporting the thermostat device class):

1. **Set your primary controller to Include, Add or Install mode**, to add the thermostat as a node on your network (see your controller's user manual for detailed instructions).
2. **In the Thermostat's Main Menu, scroll down to the ZWave Install item.** Select the item.
3. **When prompted by your Z-Wave controller, Press the YES button** in the ZWave Install screen.

Your controller will indicate the thermostat was successfully added to its network (see your controller's user manual for details). Also you can check if the thermostat was successfully added to the network by checking the ZHID (Home ID) and ZNID (Node ID) located in the **Thermostat Info** screen.

For other specific tasks such as adding the thermostat to Scenes or Groups, or deleting the thermostat from an existing network, use the Z-Wave Install procedure.

Note: Before adding the thermostat to a Z-Wave Network, check that it does not already belong to one by viewing the Node ID (ZNID) located in the **Thermostat Info** screen. An un-installed thermostat should show zeros for the Node ID (000). Consult your controller's user manual for details on removing a device from a Z-Wave network.

Setback Mode Operation

If your controller does not support full thermostat device class functions, it may still be able to control the energy saving AWAY mode of the thermostat through BASIC_SET commands.

Sending the BASIC_SET (Value = 0x00), the thermostat will go into the AWAY mode and use the predefined AWAY setback setpoints. These setpoints are set in the Main Menu Away Setpoints item.

Sending the BASIC_SET (Value = 0xFF), the thermostat will revert back to the Home mode it was in before the BASIC_SET (Value = 0x00) command was sent.

Note that when the BASIC_SET commands are sent, the TZ45 will momentarily display the new mode.

Inclusion and Exclusion

Inclusion or exclusion is started by putting the controller into add node or remove node state and performing the General Programming Procedure outlined above. As part of the process, the thermostat sends a node information frame at normal power.

Low power inclusion or low power exclusion is not possible.

FCC/IC

INFORMATION TO USER

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.

This equipment has been tested and found to comply with the limits for 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 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

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

This device complies with Industry Canada licence-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