



Installation and Operating Instructions

Part Number 33CSSP2-FC


IMPORTANT: Read entire instructions before starting the installation.

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SAFETY CONSIDERATIONS

Read and follow manufacturer instructions carefully. Follow all local electrical codes during installation. All wiring must conform to local and national electrical codes. Improper wiring or installation may damage thermostat.

Recognize safety information. This is the safety alert symbol . When the safety alert symbol is present on equipment or in the instruction manual, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, and CAUTION. These words are used with the safety alert symbol. DANGER identifies the most serious hazards which will result in severe personal injury or death. WARNING signifies a hazard which could result in personal injury or death. CAUTION is used to identify unsafe practices which would result in minor personal injury or property damage.

GENERAL

The fan coil programmable thermostats are wall-mounted or unit-mounted, low-voltage thermostats which maintain room temperature by controlling the operation of a fan coil unit.

Separate heating and cooling set points, auto-changeover capability, 2-pipe or 4-pipe configurability, and single or dual set point options allow for greater flexibility.

The thermostats are normally wall-mounted for 42C and 42D fan coil units. For 42S and 42V fan coil units, the thermostat is mounted on the fan coil unit or inside the fan coil unit on a junction box. For 42S and 42V fan coil units, the thermostat may also be remote wall-mounted, if desired.

All thermostats allow up to 4 time/temperature settings to be programmed per 24-hour period. Each thermostat stores programs for 7 independent days. Batteries are not required. During power interruption, the internal NEVERLOST™ memory stores configuration settings for an unlimited amount of time while the clock continues to run for at least 48 hours.

The thermostat can be configured to accept several different equipment configurations, including 2-pipe or 4-pipe operation.

The temperature display range of the thermostat is 35 to 99 F (2 to 36 C).

NOTE: The thermostat is factory-configured for use in 4-pipe applications. The advanced setup must be performed to configure the thermostat for use with 2-pipe applications.

INSTALLATION

Select Thermostat Location — The thermostat should be mounted:

- approximately 5 ft from the floor
- close to or in a frequently used room, preferably on an inside partitioning wall
- on a section of wall without pipes or ductwork
- where temperature operating limits are within 32 to 122 F (0° to 50 C)
- where humidity operating range is within 0 to 95% relative humidity, non-condensing

The thermostat should **NOT** be mounted:

- close to a window, on an outside wall, or next to a door leading to the outside
- where exposed to direct light and heat from a lamp, the sun, a fireplace, or any other temperature-radiating object which may cause a false reading
- close to or in direct airflow from supply registers or return-air grilles
- in areas with poor air circulation (such as behind a door or in an alcove)

Install Thermostat

WARNING

Before installing thermostat, turn off all power to the unit. There may be more than one power disconnect. Electrical shock can cause injury or death.

1. Turn off all power to fan coil unit.
2. If an existing thermostat is being replaced:
 - a. Remove existing thermostat from the wall or unit.

- b. Disconnect wires from existing thermostat. Do not allow wires to fall back into the wall. As each wire is disconnected, record wire color and terminal connection.
- c. Discard or recycle old thermostat.

NOTE: Mercury is a hazardous waste and must be disposed of properly.

- 3. Thermostat can be mounted directly to the wall or onto the unit when required. See Fig. 1. An accessory wall mounting plate is available when an existing hole in the wall is too large for the thermostat or when mounting to a junction box in the wall (the thermostat will not completely cover a 2 x 4-in. junction box).
- 4. If mounting plate is being used, install mounting plate on wall or junction box. Mounting plate consists of two pieces: the metal mounting plate (see Fig. 2A) and the plastic mounting plate (see Fig. 2B). The standard mounting plate will cover a 2 x 4-in. or 4 x 4-in. junction box. Accessory mounting plates of different sizes are also available. Accessory mounting plate part numbers are P474-0421 (7 x 4 1/4-in.) or P474-0421L (5 1/2 x 6 1/4-in.).
 - a. Install the metal mounting plate to wall or junction box with 2 screws provided. Use the outermost screw holes.
 - b. Place plastic mounting plate over the metal mounting plate. Be sure wiring exits through holes in both mounting plates. Plastic mounting plate is secured to metal mounting plate when the thermostat mounting base is installed (Step 7).
- 5. Remove the thermostat cover from back plate to expose mounting holes and wiring connections. See Fig. 1.
- 6. Route thermostat wires through large hole in thermostat mounting base. Remove outer sheath from wires for added flexibility. Standard solid or multi-conductor thermostat wire should be used from the thermostat to the unit. **Size and length considerations are as follows: for a maximum distance from unit of 36 ft, use 22 AWG (American Wire Gage) wire; for a maximum distance from unit of 100 ft, use 18 AWG wire.**
- 7. *If accessory mounting plate is not used:*

Level back plate against wall and mark wall through the 2 mounting holes in base. Drill two 3/16-in. mounting holes in wall where marked. Mounting holes are provided if installing on unit.

⚠ CAUTION

Improper wiring or installation may cause damage to the thermostat. Check to ensure wiring is correct before proceeding with installation of unit. Do not run thermostat wiring in same conduit as high-voltage power, or HVAC wiring. Interference from other wiring may cause incorrect readings or commands from thermostat.

- 9. Push excess wiring into wall. Seal hole in wall to prevent drafts.
- 10. Re-attach thermostat cover to back plate.
- 11. Turn on power to unit. The thermostat will receive power from the fan coil unit.

NOTE: The thermostat is strictly a low-voltage control. One or two 33ZCRLYBRD relay boards must be installed to isolate any line voltage, fans, or water valves from the fan coil.

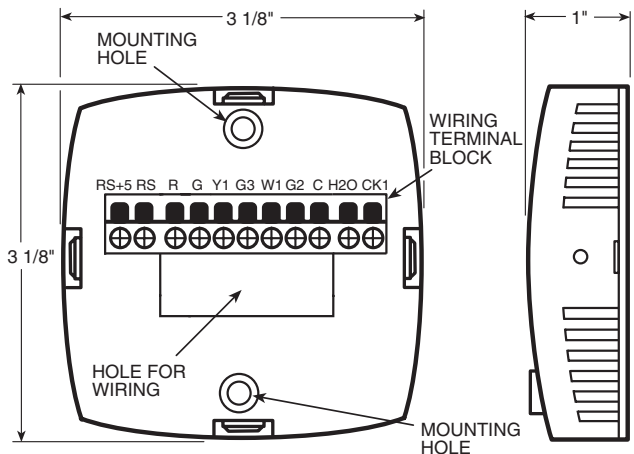


Fig. 1 — Thermostat Back Plate Mounting and Wiring

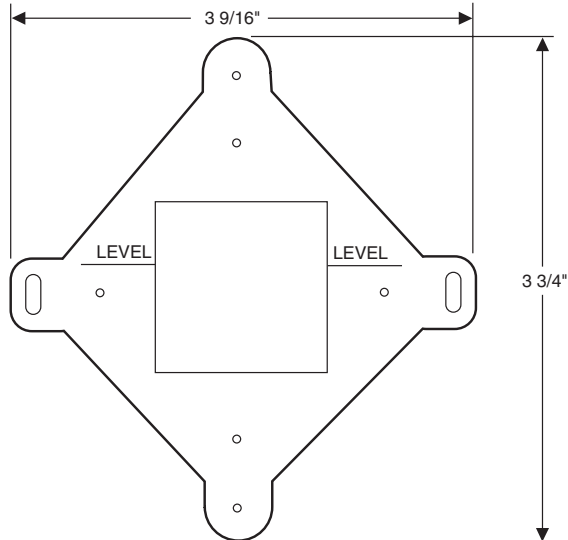


Fig. 2A — Metal Mounting Plate Dimensions

⚠ WARNING

Be careful not to drill into wiring in wall. Electrical shock could result.

Secure back plate to wall or unit with 2 screws and anchors provided. Ensure all wires exit through hole in back plate.

If accessory mounting plate is used:

Secure the metal mounting plate to the wall with two screws provided. Use the outermost screw holes. Place the thermostat back plate securely in the indentation provided in the plastic mounting plate. Place plastic mounting plate and thermostat back plate over metal mounting plate. Secure mounting plates and thermostat back plate to the wall with 2 screws provided. Ensure all wires exit through hole in mounting base.

- 8. Adjust wire length and routing to allow proper closure of the thermostat. Strip each wire at the end no more than 1/4-in. to prevent adjacent wires from shorting together. Match and connect wires to terminals on the thermostat. See Fig. 3-7 and Tables 1 and 2.

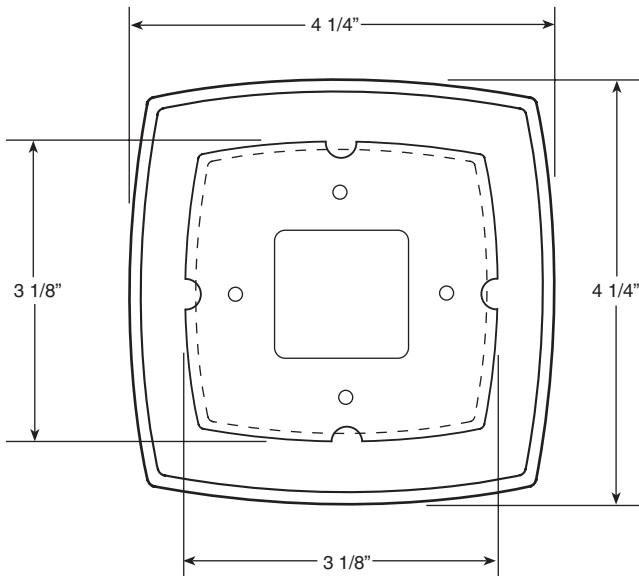


Fig. 2B — Plastic Mounting Plate Dimensions

Table 1 — Thermostat Wiring Terminations (4-Pipe Systems)

EXISTING WIRE DESIGNATION	FUNCTION	TERMINAL CONNECTION
Y1, Y, or C	Cooling	Y1
W1, W, or H	Heating	W1
Rh, R, M, Vr, or A	Power	R
C	Common	C
G, F, or LOW	Low Fan Speed	G
MED	Medium Fan Speed	G2
HIGH	High Fan Speed	G3

Table 2 — Thermostat Wiring Terminations (2-Pipe Systems)

EXISTING WIRE DESIGNATION	FUNCTION	TERMINAL CONNECTION
Y1, Y, or C	Water Valve	Y1
W1, W, or H	Strip Heater	W1
Rh, R, M, Vr, or A	Power	R
C	Common	C
G, F, or LOW	Low Fan Speed	G
MED	Medium Fan Speed	G2
HIGH	High Fan Speed	G3

Changeover Sensor — If the thermostat is being used with a two-pipe system, a changeover sensor (33CSWCO-FC) may be used to provide automatic heat/cool mode changeover.

Set Clock — The Set Clock function allows the user to change the time and day displayed on the thermostat. Press and hold the Mode and Fan buttons at the same time for 2 seconds until the display changes. The display will show the Setup annunciator. The current time will blink on and off. Press the UP ARROW and DOWN ARROW buttons until the correct time is shown. Hold down the buttons to quickly move through the time display. The AM and PM annunciators will automatically change. To scroll through by hours instead of minutes, hold down the Fan button while pressing UP ARROW or DOWN ARROW. To ensure the schedules are properly followed, make sure that AM or PM is correct for the time chosen. When the correct time is shown, press the Mode button to modify the day of the week. The current day will blink on and off. Press the UP ARROW and DOWN ARROW buttons until the correct day is shown. Press and hold the Mode and Fan buttons simultaneously to exit the Set Clock mode.

Configure Advanced Setup — To enter the advanced setup screens of the thermostat, press the Mode and Fan

buttons simultaneously for 10 seconds. Set thermostat mode to OFF before configuring the thermostat.

NOTE: The display will change after 2 seconds. This is a quick configuration to set the clock only. Continue to hold down the Mode and Fan buttons for 10 seconds to enter Advanced Setup mode.

The display will change. If only Advanced Setup Steps 1 and 2 are accessible, then the buttons were not held down long enough. The Advanced Setup Step number is shown in the top right corner of the thermostat screen. Use the Mode button to advance through the steps. There are 15 Advanced Setup Steps. Use the UP and DOWN ARROW buttons to change the settings. See Table 3. Press the Mode and Fan buttons at the same time to exit the Advanced Setup mode.

NOTE: Refer to the Set Clock section for Advanced Setup Steps 1 and 2.

DISPLAY CONFIGURATION (Step 3) — The Display configuration is used to select what the thermostat will display when it is not being used. If the configuration is set to ON, the thermostat will display mode, fan operation, set points, and room temperature. If the configuration is set to OFF, the thermostat will only display the time. If any button is pressed, the thermostat screen will return to full display. The default is ON.

SINGLE OR DUAL SET POINT CONFIGURATION (Step 4) — Step 4 is used to configure the thermostat for single or dual set point operation. The configuration can be set to 1 or 2. The default is 2. When the configuration is set to 1, then there is only one set point which is used for both heating and cooling. When the configuration is set to 2, then there are two set points (one for heating, one for cooling).

TWO OR FOUR PIPE SYSTEM CONFIGURATION (Step 5) — Step 5 is used to configure the thermostat for use in a 2-pipe or 4-pipe system. When the configuration is set to 2, the thermostat will be configured for use with a 2-pipe system. When the configuration is set to 4, the thermostat will be configured for use with a 4-pipe system. The default is 4.

NOTE: Advanced Setup Step 6 will only be shown if Step 5 is set to 2.

TWO-PIPE SYSTEM OPERATION (Step 6) — Step 6 is used to configure the thermostat for use in a 2-pipe system. The configuration can be set to 1, 2, 3, 4, or 5. The default is 3. When the Two-Pipe Operation configuration is set to 1, the two-pipe system will function as a Heat-Only system. When the Two-Pipe Operation configuration is set to 2, the two-pipe system will function as a Cool-Only system. When the Two-Pipe Operation configuration is set to 3, the two-pipe system will function as a Heat/Cool Auto-Changeover system. When the Two-Pipe Operation configuration is set to 4, the two-pipe system will function as a Heat/Cool system with auxiliary electric heat (lockout electric heat when hot water is available). When the Two-Pipe Operation configuration is set to 5, the two-pipe system will function as a Heat/Cool system with total electric heat (no hot water heat).

FAN OPERATION (Step 7) — If the fan operation is set to ON, the fan will operate at continuous low speed. If the fan operation is set to OFF, the fan will cycle off and will only be energized during a heating or cooling cycle (AUTO mode). The default is ON.

NOTE: When a remote temperature sensor is used, the choice should be Fan ON.

DEADBAND (Step 8) — The deadband is the difference in temperature above the cooling set point or below the heating set point that the thermostat will wait before turning on the first stage of heating or cooling. For example, if the cooling set point is 82 F (28 C) and the deadband is 2 degrees, the first stage of cooling will not be energized until the temperature reaches 84 F (29 C). The range of values is 1 to 6 degrees. The default is 2 degrees.

NOTE: If single set point operation is used, the deadband will be above and below the single set point.

SET POINT MINIMUM DIFFERENCE (Step 9) — The minimum difference between heating and cooling set points can be user-configured. The range is from 0 to 6 degrees. The default is 2 degrees. The minimum difference is enforced during Autochangeover and Program On operation.

BACKLIGHT DISPLAY (Step 10) — The display backlight can be set to ON (always on) or OFF (turn off 8 seconds after usage). The default is OFF.

FAHRENHEIT/CELSIUS OPERATION (Step 11) — The thermostat can be set to operate in Fahrenheit or Celsius degrees. Set the variable to “F” for Fahrenheit operation. Set the variable to “C” for Celsius operation. The default is “F.”

REMOTE SENSOR (Step 12) — The Remote Sensor configuration is used to configure the operation of a remote sensor (if used). If the configuration is set to YES, then the remote sensor will function as an outdoor air temperature sensor (read only). The thermostat will not control to the temperature. If the configuration is set to NO, then the remote sensor will function as a remote temperature sensor. The thermostat will control to the temperature reading from the sensor. The default is YES.

OVERRIDE TIME DURATION (Step 13) — Step 13 is used to adjust the amount of time that the override will activate Occupied 1 set points during a programmed Unoccupied time period. The range is 0 to 6 hours. The default is 2 hours.

DRY CONTACT SWITCH (Step 14) — Step 14 is used to configure the dry contact switch as normally open (NO) or normally closed (NC). The default is NO.

DRY CONTACT SWITCH OPERATION (Step 15) — Step 15 is used to configure the operation of the dry contact switch. When the dry contact switch is active, the thermostat can enter Occupied or Unoccupied mode. If the configuration is set to Occupied, then the thermostat will enter Occupied mode when the dry contact switch is active. If the configuration is set to Unoccupied, then the thermostat will enter Unoccupied mode when the dry contact switch is active. The default is Occupied.

NOTE: Step 16 will only be displayed if Step 15 is set to Unoccupied.

DRY CONTACT SWITCH UNOCCUPIED OPERATION (Step 16) — If the Step 15 configuration is set to Unoccupied, then the thermostat will enter Unoccupied mode when the dry contact switch is energized. Step 16 determines what the thermostat will do when it enters Unoccupied mode. If the configuration is set to Unoccupied Set Points, then the thermostat will control to the unoccupied set points. If the configuration is set to Off, the thermostat will turn off the fan coil during Unoccupied mode. The default is to control to the unoccupied set points.

The dry contact switch configuration allows for the dry contact switch input to be used for a condensate overflow switch when correctly configured. For example, when the drain pan is full, a condensate switch would trip the dry contact, causing the fan coil unit to shut off.

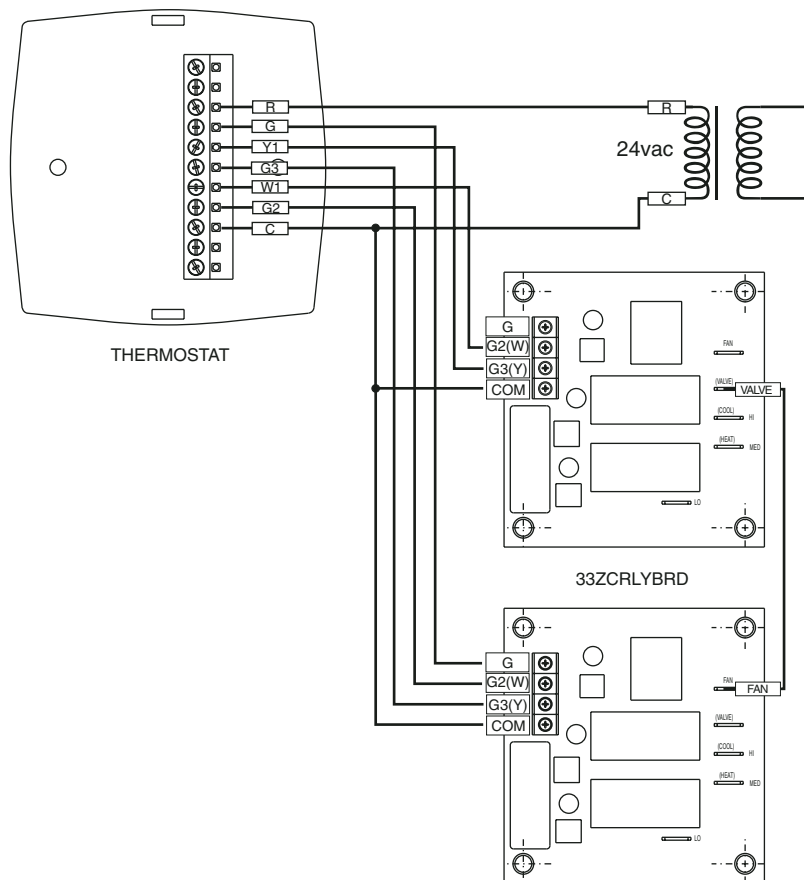


Fig. 3 — Typical Wiring Diagram — 4-Pipe, 2-Relay Boards, Line Voltage Water Valves

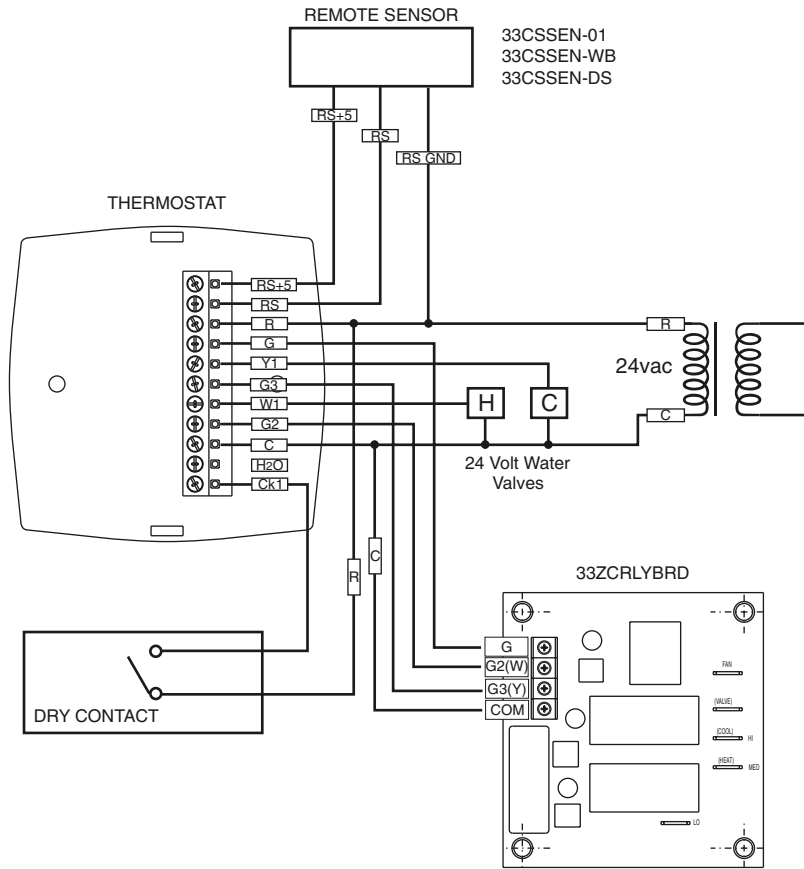


Fig. 4 — Typical Wiring Diagram — 4-Pipe, Low Voltage Valves, Remote Temperature Sensor and Dry Contact

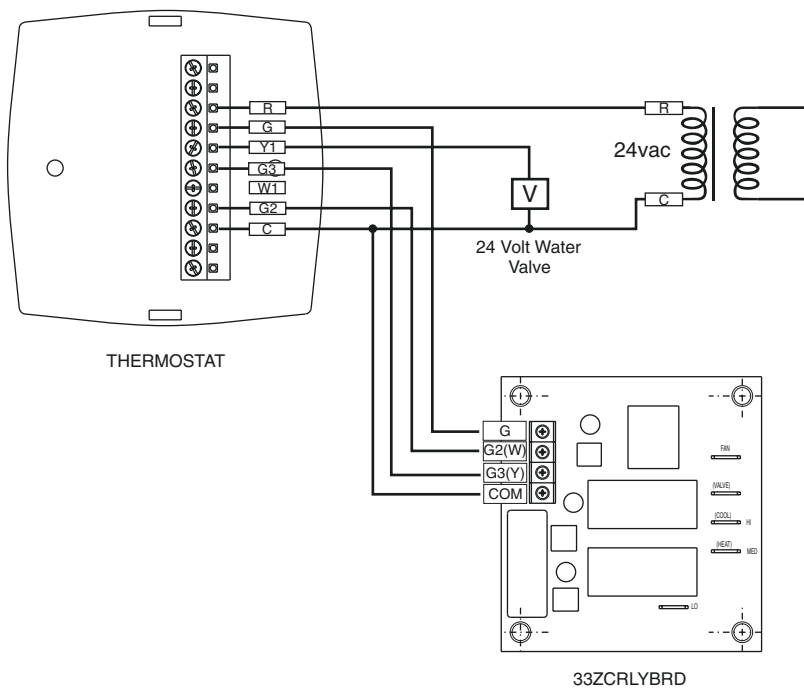


Fig. 5 — Typical Wiring Diagram — 2-Pipe, Low Voltage Valve, Heat Only or Cool Only

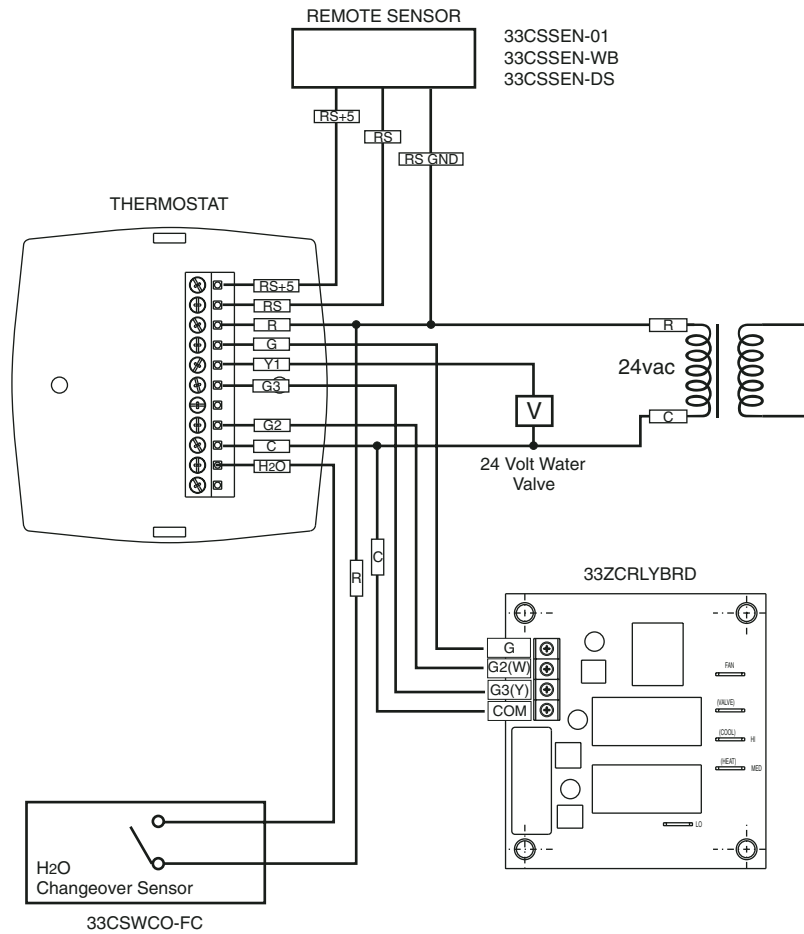


Fig. 6 — Typical Wiring Diagram — 2-Pipe, Low Voltage Valve, Water Changeover Sensor

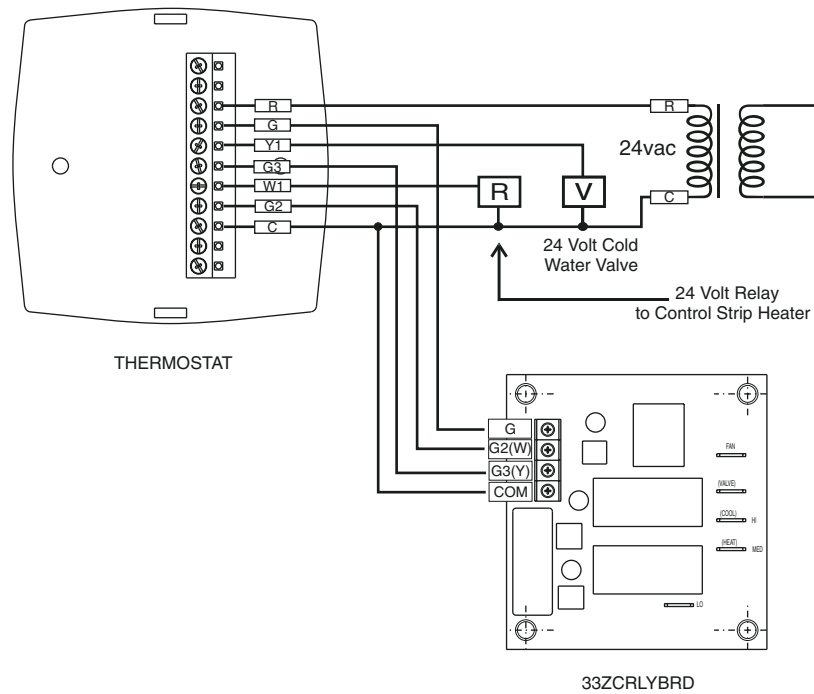


Fig. 7 — Typical Wiring Diagram — 2-Pipe, Low Voltage Valve, Chilled Water with Electric Strip Heat

Table 3 — Advanced Setup Configuration

STEP	DESCRIPTION	RANGE	DEFAULT
1	Time of Day (Clock)	24 Hour	12:00 AM
2	Day of Week	Su - Sa	Mo
3	Display Blanking	OFF/ON	ON
4	Single/Dual Set Point	1, 2	2
5	2 or 4 Pipe System	2, 4	4
6	2-Pipe System Operation	1-5	3
7	Fan Operation	OFF/ON	ON
8	Deadband	1-6 degrees	2
9	Set Point Minimum Temperature Difference	0 - 6 degrees	2
10	Thermoglow™ Backlight	OFF/ON	OFF
11	Temperature Units	F/C	F
12	Remote Sensor Setup	YES/NO	YES
13	Override Time Duration	0-6 hours	2 hours
14	Dry Contact Switch	NO/NC	NO
15	Dry Contact Switch Operation	Occupied, Unoccupied	Occupied
16	Dry Contact Switch Unoccupied Operation	Off, Set Points	Set Points

Install Accessories — The Add-A-Wire™ accessory can be used with this thermostat. The remote temperature sensor (33CSSEN-WB), outdoor-rated temperature sensor (33CSSEN-01), and the duct sensor (33CSSEN-DS) can be used with this thermostat.

Refer to the individual accessory installation instructions for more information.

Program Thermostat Schedules — Before programming the thermostat, plan the thermostat daily schedule. The schedule is divided into 7 days (Monday through Sunday). Each day has from 2 to 4 time periods (Occupied 1, Occupied 2, Occupied 3, Unoccupied) depending on the configuration of the thermostat. Each occupied time period has a start time, stop time, heating set point, and cooling set point. The unoccupied time period has a heating set point and a cooling set point. The unoccupied time period is active whenever an occupied time period is not active. Fill in Table 4 as an aid to programming the daily schedules.

PROGRAMMING MODE — To program the daily schedules, perform the following procedure:

1. Enter Programming mode by pressing and holding the Mode and UP ARROW buttons. The Occupied 1 annunciator will appear on the thermostat display. Use the UP ARROW and DOWN ARROW buttons to set the

maximum number of Occupied periods for each day. The thermostat can be set to 1, 2, or 3. After the number of Occupied periods has been selected, press the Mode button. See Fig. 8.

2. The cooling set point for Occupied 1 will be displayed. Use the UP ARROW and DOWN ARROW buttons to raise or lower the cooling set point until the desired temperature is shown. The range of acceptable values is 35 to 99 F (2 to 36 C). Press the Mode button to continue. See Fig. 8.
3. The heating set point for Occupied 1 will be displayed. Use the UP ARROW and DOWN ARROW buttons to raise or lower the heating set point until the desired temperature is shown. The range of acceptable values is 35 to 99 F (2 to 36 C). Press the Mode button to continue. See Fig. 8.
4. The cooling set point for Unoccupied will be displayed. Use the UP ARROW and DOWN ARROW buttons to raise or lower the cooling set point until the desired temperature is shown. The range of acceptable values is 35 to 99 F (2 to 36 C) or “OF” (no unoccupied cooling). To configure the Unoccupied Cooling set point to OF, press the DOWN ARROW button until 35 F (2 C) is displayed. Press the DOWN ARROW button again to display OF. Press the Mode button to continue.
5. The heating set point for Unoccupied will be displayed. Use the UP ARROW and DOWN ARROW buttons to raise or lower the heating set point until the desired temperature is shown. The range of acceptable values is 35 to 99 F (2 to 36 C). Press the Mode button to continue.
6. The day of the week will be shown. Use the UP ARROW and DOWN ARROW buttons to change the day of the week until the desired starting day is shown. Possible choices are Mo (Monday) through Su (Sunday). Press the Mode button when the desired day is shown.
7. The Start Time for Occupied 1 will be displayed. Use the UP ARROW and DOWN ARROW buttons to raise or lower the time until the desired Start Time is shown. Press the Mode button to continue. See Fig. 9.
8. The Stop Time for Occupied 1 will be displayed. Use the UP ARROW and DOWN ARROW buttons to raise or lower the time until the desired Stop Time is shown. Press the Mode button to continue.
9. The ON/OFF icon will be displayed. Use the UP ARROW to turn the Occupied 1 period ON for this day. Use the DOWN ARROW to turn the Occupied 1 period OFF for this day.
10. Repeat Steps 2 through 9 to program the remaining schedule for Occupied periods 2 and 3.

Table 4 — Daily Schedule Planner

DAY OF THE WEEK	SCHEDULE			
	Occupied 1	Occupied 2	Occupied 3	Unoccupied
	Start / Stop / Heat / Cool	Start / Stop / Heat / Cool	Start / Stop / Heat / Cool	Heat / Cool
Monday	/ / /	/ / /	/ / /	/
Tuesday	/ / /	/ / /	/ / /	/
Wednesday	/ / /	/ / /	/ / /	/
Thursday	/ / /	/ / /	/ / /	/
Friday	/ / /	/ / /	/ / /	/
Saturday	/ / /	/ / /	/ / /	/
Sunday	/ / /	/ / /	/ / /	/

NOTE: The cooling temperature set point must be higher than the heating temperature set point. (The temperature difference may be changed in the advanced set up configuration.)

- The Copy command can be used to copy the previous day's schedule if the schedules are the same. The copy command becomes available after all the occupied periods are programmed in a day. Use the UP ARROW to change the copy command to YES. Use the DOWN ARROW to change the copy command to NO. Press the Mode button when the choice has been made. See Fig. 10. If NO was selected, the schedule will automatically change to the next day and the user must enter the occupied and unoccupied schedules for that day.

NOTE: Occupied 1 schedule heating and cooling set points are the same for each day. Occupied 2 and 3 set points may be set to different values for each day of the week.

If YES was selected, the schedule will be copied to the next day. The schedule copy may be repeated until Sunday is reached. The Sunday schedule cannot be copied to Monday.

- After all the times and set points for each day have been entered, press and hold the Mode and UP ARROW buttons to exit Programming mode.

NOTE: The thermostat will continue to follow the schedule until a new one is entered.

If only one occupied schedule is selected, the Occupied 2 and 3 schedules are skipped. If the start time is set later in the day than the stop time, the program will run from midnight of that day to the stop time and then from the start time to midnight. If the same start and stop times are programmed for an occupancy schedule, the thermostat will be in Occupied mode for 24 hours. If one occupied period starts or stops within another occupied period, the lower numbered schedule has priority. For example, if schedule Occupied 3 is running for 24 hours and Occupied 2 schedule comes on from 1 to 3 PM, the set points from Occupied 2 are in effect from 1 to 3 PM.

OVERRIDING THE SCHEDULE — The normal time schedule can be overridden by pressing and holding the FAN button for 5 seconds during programmed, unoccupied periods. The override feature may only be used when the thermostat is running the time schedule in Program On mode. Pressing and holding the FAN button for 5 seconds will temporarily force the thermostat into Occupied 1 comfort settings for 1 to 6 hours. The Override icon will be illuminated during this time. Pressing and holding the FAN button, while the thermostat is currently overriding the daily schedule, will reset the timer. The thermostat will then return to the correct time period for the day.

Factory Defaults — If the thermostat needs to be reset to factory default settings, perform the following procedure:

- Set thermostat mode to OFF.
- Hold down the Mode button and press the DOWN ARROW button simultaneously for 5 seconds. All of the icons on the display screen will appear.
- Press and hold the Fan button until Fd (factory defaults) appears on the screen.
- Press the Mode button twice to return to normal display.

NOTE: The occupied and unoccupied schedules will be reset. The schedule will need to be re-entered.

Calibrate Sensor — Every thermostat is factory-calibrated. Under normal circumstances there will never be a need to re-calibrate the thermostat. If re-calibration must be done, perform the following procedure:

- Set thermostat mode to OFF.
- Hold down the Mode and DOWN ARROW buttons for 5 seconds. All of the icons on the display screen will appear. Release the buttons.

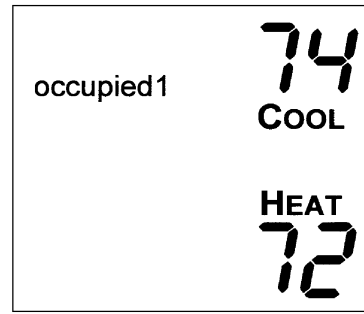


Fig. 8 — Setting Occupied 1 Set Points

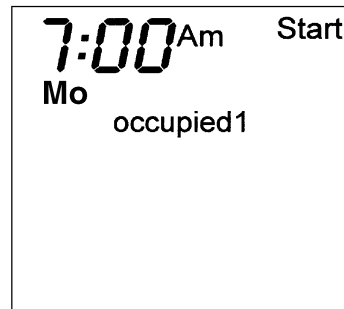


Fig. 9 — Start Time Display

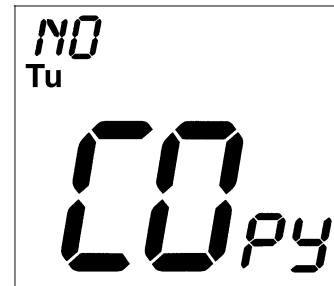


Fig. 10 — Copy Command Display

- Press the Mode button. The current temperature will be displayed.
- Use an accurate thermometer to measure room temperature. Press the UP or DOWN ARROW buttons until the number equals room temperature.
- Press the Mode button to return to normal operation.

Check Thermostat Operation

FOUR-PIPE OPERATION — To check thermostat operation with a 4-pipe system, perform the following procedure:

- Turn on power to the fan coil unit.
- Press the Mode button repeatedly until the Heat icon appears on the display. The thermostat is now in Heating mode.
- Press the UP ARROW button until the heating set point is 10 F (6 C) higher than the current room temperature. The hot water valve will open and the fan should be energized.

4. Press the Fan button repeatedly until the Fan icon appears with a single bar next to it. Confirm that the fan is running at low speed. Press the Fan button again. The Fan icon appears with two bars next to it. Confirm that the fan is running at medium speed. Press the Fan button again. The Fan icon appears with three bars next to it. Confirm that the fan is running at high speed. Press the Fan button again. The bars next to the Fan icon should disappear.
5. Press the Mode button repeatedly until the Cool icon appears on the display. The thermostat is now in Cooling mode.
6. Press the DOWN ARROW button until the cooling set point is 10 F (6 C) lower than the current room temperature. The cold water valve will open and the fan should be energized.
7. Press the Mode button repeatedly until the OFF icon appears. Both valves should be closed and the fan should be off.
8. If heating, cooling, or fan do not operate properly, check wiring and consult Table 5.

TWO-PIPE OPERATION WITH CHANGEOVER SENSOR AND NO STRIP HEAT — To check thermostat operation of a 2-pipe system with changeover sensor, perform the following procedure:

1. Turn on power to the fan coil unit.
2. Make sure the thermostat is correctly configured for use in two-pipe applications. Advanced setup Step 5 should be set to 2 (two-pipe applications). Advanced setup Step 6 should be set to 3 (heat/cool changeover system without electric heat).
3. Press the Fan button repeatedly until the Fan icon appears with a single bar next to it. Confirm that the fan is running at low speed. Press the Fan button again. The Fan icon appears with two bars next to it. Confirm that the fan is running at medium speed. Press the Fan button again. The Fan icon appears with three bars next to it. Confirm that the fan is running at high speed. Press the Fan button again. The bars next to the Fan icon should disappear. When no bars are shown, the fan will run in AUTO mode. The fan speed will automatically change based on load requirements.
4. If hot water heat is available, press the Mode button repeatedly until the Heat icon appears on the display. The thermostat is now in Heating mode.
5. Press the UP ARROW button until the heating set point is 10 F (6 C) higher than the current room temperature. The hot water valve will open and the fan should be energized.
6. If cold water cooling is available, press the Mode button repeatedly until the Cool icon appears on the display. The thermostat is now in Cooling mode.
7. Press the DOWN ARROW button until the cooling set point is 10 F (6 C) lower than the current room temperature. The cold water valve will open and the fan should be energized.
8. Press the Mode button repeatedly until the OFF icon appears. Both valves should be closed and the fan should be off.
9. If heating, cooling, or fan do not operate properly, check wiring and consult Table 5.

TWO-PIPE OPERATION WITHOUT CHANGEOVER SENSOR — To check thermostat operation with a 2-pipe system without changeover sensor, perform the following procedure:

1. Turn on power to the fan coil unit.
2. Make sure the thermostat is correctly configured for use in two-pipe applications. Advanced Setup Step 5 should

be set to 2 (two-pipe applications). Advanced setup Step 6 should be set to 1 (heat only), 2 (cool only), or 5 (cooling with strip heat).

3. Press the Fan button repeatedly until the Fan icon appears with a single bar next to it. Confirm that the fan is running at low speed. Press the Fan button again. The Fan icon appears with two bars next to it. Confirm that the fan is running at medium speed. Press the Fan button again. The Fan icon appears with three bars next to it. Confirm that the fan is running at high speed. Press the Fan button again. The bars next to the Fan icon should disappear. When no bars are shown, the fan will run in AUTO mode. The fan speed will automatically change based on load requirements.
4. If heating is available, press the Mode button repeatedly until the Heat icon appears on the display. The thermostat is now in Heating mode. Press the UP ARROW button until the heating set point is 10 F (6 C) higher than the current room temperature. Heating will energize (the hot water valve will open or the strip heat will energize) and the fan will run.
5. If cooling only or cooling only with strip heat system, press the Mode button repeatedly until the Cool icon appears on the display. The thermostat is now in Cooling mode. Press the DOWN ARROW button until the cooling set point is 10 F (6 C) lower than the current room temperature. The cold water valve will open and the fan will run.
6. Press the Mode button repeatedly until the OFF icon appears. All valves should be closed and the strip heater and fan should be off.
7. If heating, cooling, or fan do not operate properly, check wiring and consult Table 5.

TWO-PIPE OPERATION WITH CHANGEOVER SENSOR AND STRIP HEAT — To check thermostat operation of a 2-pipe system with changeover sensor and strip heat, perform the following procedure:

1. Turn on power to the fan coil unit.
2. Make sure the thermostat is correctly configured for use in two-pipe applications. Advanced setup Step 5 should be set to 2 (two-pipe applications). Advanced setup Step 6 should be set to 4 (heat/cool changeover system with electric heat).
3. Press the Fan button repeatedly until the Fan icon appears with a single bar next to it. Confirm that the fan is running at low speed. Press the Fan button again. The Fan icon appears with two bars next to it. Confirm that the fan is running at medium speed. Press the Fan button again. The Fan icon appears with three bars next to it. Confirm that the fan is running at high speed. Press the Fan button again. The bars next to the Fan icon should disappear.
4. If hot water heat is available, press the Mode button repeatedly until the Heat icon appears on the display. The thermostat is now in Heating mode.
NOTE: The strip electric heat and cooling will be locked out if hot water heat is available.
5. Press the UP ARROW button until the heating set point is 10 F (6 C) higher than the current room temperature. The hot water valve will open or the strip heat will energize and the fan should be energized.
6. If cold water cooling is available, press the Mode button repeatedly until the Cool icon appears on the display. The thermostat is now in Cooling mode.
7. Press the DOWN ARROW button until the cooling set point is 10 F (6 C) lower than the current room temperature. The cold water valve will open and the fan should be energized.

8. Press the UP ARROW button until the heating set point is 10 F (6 C) higher than the current room temperature. Electric strip heating will be available if cold water is sensed by the changeover sensor. The strip heater will energize and the fan will run.
9. Press the Mode button repeatedly until the OFF icon appears. Both valves should be closed and the strip heat and fan should be off.
10. If heating, cooling, or fan do not operate properly, check wiring and consult Table 5.

Final Checklist

1. Put away tools and instruments. Clean up debris and packaging.
2. Review Owner's Guide with occupant or owner.
3. Leave the manuals with owner.

OPERATION

Select Desired Temperature — The UP and DOWN ARROW buttons are used to adjust the heating and cooling set points. Pressing the UP and DOWN ARROW buttons in Auto mode will adjust both the heating and cooling set points. Pressing the UP and DOWN ARROW buttons in either Heat or Cool mode will adjust only the heating or cooling set point.

NOTE: If the Single Set Point mode is configured, there will be only one set point for both heating and cooling.

Four-Pipe Operation — The Mode button selects the operating mode of the thermostat. If OFF is selected, the thermostat will not enter Heating or Cooling mode. If HEAT is selected, the thermostat will only enter Heating mode (if the room temperature is below the heating set point). If COOL is selected, the thermostat will only enter Cooling mode (if the room temperature is above the cooling set point). If AUTO is selected, the thermostat will enter Heating or Cooling mode based on the room temperature and the heating and cooling set points. If Program On is selected, the thermostat will follow the Occupied schedule.

Two-Pipe Operation

HEAT ONLY — When the thermostat is configured for Heat Only operation, only Heat, Program On and Off modes can be selected.

COOL ONLY — When the thermostat is configured for Cool Only operation, only Cool, Program On and Off modes can be selected.

HEAT/COOL WITH CHANGEOVER SENSOR — When the thermostat is configured for operation with a changeover sensor, all modes are available for operation. If the water temperature is changed during the year, the thermostat will automatically lock out the incorrect mode. Heat or Cool modes may not be available, depending on water temperature.

TOTAL OR AUXILIARY ELECTRIC HEAT — The Mode button selects the operating mode of the thermostat. If OFF is selected, the thermostat will not enter Heating or Cooling mode.

If HEAT is selected, the thermostat will only enter Heating mode (if room temperature is below the heating set point). For total electric heat, a call for heat will activate the electric heater. For auxiliary electric heat, a call for heat will either activate the electric heater (if chilled water is in the coil), or open the coil valve (if hot water is in the coil).

If COOL is selected, the thermostat will only enter Cooling mode (if room temperature is above the cooling set point and chilled water is in the coil).

If AUTO is selected, the thermostat will enter Heating or Cooling mode based on the room temperature and the heating and cooling set points.

Fan Operation — The Fan button is used to select fan operation. When only the Fan icon is shown, the fan is in "Auto" mode and will run continuously (unless thermostat mode is set to OFF or thermostat is in unoccupied mode and heating or cooling are not active). The thermostat will increase or decrease the fan speed based on temperature demand.

Fan operation can also be set to always run at Low, Medium, or High speeds. To set fan operation at Low speed, press the Fan button until one bar is shown next to the Fan icon. The fan will run continuously at Low speed (unless thermostat mode is set to OFF or thermostat is in unoccupied mode and heating or cooling are not active).

To set fan operation at Medium speed, press the Fan button until two bars are shown next to the Fan icon. The fan will run continuously at Medium speed (unless thermostat mode is set to OFF or thermostat is in unoccupied mode and heating or cooling are not active).

To set fan operation at High speed, press the Fan button until three bars are shown next to the Fan icon. The fan will run continuously at High speed (unless thermostat mode is set to OFF or thermostat is in unoccupied mode and heating or cooling are not active).

Keypad Lock — To prevent unauthorized use of the thermostat, the front panel buttons can be disabled. To disable or lock the keypad, press and hold the Mode button. While holding down the Mode button, press the UP and DOWN ARROW buttons simultaneously. The "Locked" icon will appear on the display.

The thermostat is unlocked by performing the same procedure. Press and hold the Mode button. While holding down the Mode button, press the UP and DOWN ARROW buttons simultaneously. The "Locked" icon will be removed from the display.

Clock Backup — In the event of a power loss, the thermostat internal clock will continue to keep proper time for a minimum of 48 hours without external power or batteries.

Minimum Heat/Cool Temperature Difference — The heating and cooling set points will not be allowed to be set any closer to each other than the value set in Advanced setup Step 9. The minimum temperature difference is enforced during Auto mode and Program On operation.

Single Set Point Operation — When the thermostat is configured for single set point operation, the display on the thermostat will change. Instead of displaying current room temperature, the large number shown will be the user set point. This set point is used for both heating and cooling.

To prevent short cycling in single set point mode, it is recommended that the deadband be set to a minimum of 2.

Press and hold the Mode button for 2 seconds to display the room temperature. Press any button to return to the normal display.

Dual Set Point Operation — When the thermostat is configured for dual set point operation, there are separate heat and cool set points. The adjustable set point range is 35 to 99 F (2 to 36 C). When the thermostat is in Heat or Cool mode, the set points can be adjusted to any temperature within the operating range.

When the thermostat is in Auto mode, the thermostat will not allow the Cool set point to be lower than the Heat set point. The thermostat will also use the programmed Deadband value (Advanced Setup Step 8) to determine the minimum difference between the Heat and Cool set points. If the Deadband is set for 6 degrees, the Cool set point cannot be set within 6 F of the Heat set point.

When entering Auto mode from Heat or Cool modes, the Heat and Cool set points will remain spread apart by the same amount when the set points are adjusted. For example, if the

Cool set point is 80 F (adjusted in Cool mode) and the Heat set point is 70 F (adjusted in Heat mode), when entering Auto mode, both set points would be adjusted by the same amount when the UP and DOWN ARROW buttons are pressed. Therefore, if the DOWN ARROW was pressed 5 times, the Cool set point would be 75 F and the Heat set point would be 65 F. To adjust the set points individually, enter the Heat or Cool modes first.

Outside Air Temperature Sensor — Press and hold the Fan button for 2 seconds to display outside temperature (if optional outdoor sensor is wired to thermostat). Press any button to return to normal operation.

Locking Cover — A locking cover with tamper-proof screws is provided with the thermostat. The locking cover can be

used to keep the thermostat set points and configurations from being changed. A special tool is required to remove the cover.

Dry Contact Switch/External Control — A dry contact switch is provided to allow an external device to force the thermostat into Occupied 1, Unoccupied, or shut down the fan coil unit. If the thermostat is forced into Unoccupied set points via the dry contact closure, the Occupied 1 via the dry contact closure, the Occupied 1 icon will blink each second. The external device is wired to contacts CK1 and R.

NOTE: More than one thermostat is not required. All thermostats wired to the external device will enter Occupied 1 and Unoccupied modes at the same time.

TROUBLESHOOTING

Table 5 — Troubleshooting

PROBLEM	SOLUTION
The fan always runs in Low speed, even with no temperature demand.	This is normal operation of the thermostat. If the fan needs to be shut off, switch mode to Off. The fan will also not run in the unoccupied mode when there is no call for heating or cooling.
The fan will not run in all three speeds or switches speeds in improper order.	Wiring between the thermostat and the relay board or between the relay board and the fan is incorrect. Check the wiring for proper connection.
Cold water valve opens for both a cool or heat demand in a 4-pipe system.	Check the configuration of Advanced Setup Step 5. Configuration should be set for 4-pipe system.
Valve does not open in 2-pipe system.	Wiring or configuration is incorrect. Check the configuration of Advanced Setup Step 5. Configuration should be set for 2-pipe system. Make sure water valve is wired to the Y1 terminal.
Thermostat display only shows clock.	This is configured in Advanced Setup Step 3. Change Display Blanking configuration to Off.
Thermostat displays large set point instead of room temperature.	This is the normal display when the thermostat is set to single set point instead of dual set point (Advanced Setup Step 4).
The thermostat flashes “Occupied 1” when in Program Mode.	The sensor connected to the dry contact switch of the thermostat is active, forcing the thermostat into Occupied mode. If no sensor is connected, set the Advanced Setup Step 14 configuration to NO (normally open).
The thermostat will only allow Heat or Off modes in 2-pipe installations, even though chilled water is available.	Changeover sensor is faulty, improperly wired or improperly installed. Confirm proper wiring of the changeover sensor. Confirm proper placement of the sensor. If wiring and placement are proper, check the changeover sensor with an ohmmeter as follows: <ol style="list-style-type: none"> 1. Remove power from the fan coil system. 2. Disconnect wiring between the sensor and the thermostat. 3. Place an ohmmeter between R and the wire just disconnected from the thermostat. 4. The sensor should show continuity whenever the water temperature is confirmed to be at or below 65 F. If the sensor is open when the water temperature is at or below 65 F, replace the sensor.

