



Installation, Start-Up, and Operating Instructions

Part No. 33CSPTN-02


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IMPORTANT: Read entire instructions before starting the installation

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

Carrier's 7-day, commercial, programmable thermostats are wall-mounted, low-voltage thermostats which maintain room temperature by controlling the operation of an HVAC (heating, cooling and ventilation) system. Separate heating and cooling set points and auto-changeover capability allow occupied and unoccupied programming for energy savings.

All thermostats allow up to 4 time/temperature settings to be programmed per 24-hr period. Each thermostat stores programs for 7 independent days. Batteries are not required. During power interruption the internal memory stores comfort schedules for an unlimited time while the clock continues to run for at least 72 hours.

The thermostat can be configured to accept several different equipment configurations, from single-stage heating and cooling to 3 stages of heating (heat pump only) and 2 stages of cooling. The thermostat comes factory configured for air conditioner operation.

INSTALLATION

Step 1 — 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 41 to 104 F (5 to 40 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)

Step 2 — Set DIP Switches — There are 4 small DIP (Dual In-line Package) switches on the back of the circuit board which must be configured by the installer. The ON position is indicated by small letters on the switch. Ignore the numbers (1-4) on the switch. The switch designation (A-D) is printed on the circuit board above the switch. To change a switch position, use the corner of a small screwdriver to slide the switch ON or OFF. Set the DIP switches before installing the thermostat.

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

AIR CONDITIONER OR HEAT PUMP SELECTION (SWITCH A) — Use switch A to select between air conditioning and heat pump applications. A heat pump application uses a reversing valve. Set switch A to OFF for air-conditioning applications (no reversing valve). Set switch A to ON for heat pump applications (O is used to energize the reversing valve). The factory setting is OFF.

EMERGENCY HEAT SELECTION (SWITCH B) — Switch B is used to configure the thermostat for use with emergency heat. When Switch B is set to the ON position, the Emergency Heat mode is available on the thermostat and can be selected by using the mode button. When Switch B is set to OFF, Emergency Heat mode is not available. The default is OFF.

When the Emergency Heat mode is active, the thermostat will energize the O/W2 output when Switch A is set to OFF (air conditioner applications). The thermostat will energize the W/W1 output when Switch A is set to ON (heat pump applications).

OUTDOOR AIR OR REMOTE ROOM/LEAVING-AIR SENSOR (SWITCH C) — Switch C is used to configure the thermostat to work with either a outdoor air sensor, leaving-air sensor, or a remote room sensor. The sensor for the application must be connected to terminals S1 and S2 of the thermostat. Set switch C to OFF for a outdoor air sensor or leaving-air sensor. Set switch C to ON for a remote room sensor. The factory setting is OFF.

AVERAGING OF SENSORS (SWITCH D) — Switch D is used if a remote room sensor is being used (switch C set to ON). The remote room sensor reading can be averaged with the sensor reading of the thermostat. Set switch D to OFF if averaging is not required. To average the readings of the thermostat and one remote room sensor, set switch D to ON. The factory setting is OFF. See Space Temperature Averaging section for wiring information.

Step 3 — 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 unit.
2. If an existing thermostat is being replaced:
 - a. Remove existing thermostat from the wall.
 - 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. Open thermostat rear door (mounting base) to expose mounting holes. See Fig. 1.
4. Route thermostat wires through large hole in 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 run length of 36 ft, use 22 AWG (American Wire Gage) wire; for a maximum run length of 100 ft, use 18 AWG wire.

NOTE: When a remote room sensor or outdoor-air sensor is used, an additional conductor should be provided for grounding of the shield.

If averaging of sensors is required, see Space Temperature Averaging section for more information.

⚠ CAUTION

Terminals S2 and C are internally connected. Do not ground shield to terminal C of thermostat.

5. Level mounting base against wall and mark wall through the 2 mounting holes in base.
6. Drill two $\frac{3}{16}$ -in. mounting holes in wall where marked.

⚠ CAUTION

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

7. Secure mounting base to wall with 2 screws and anchors 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 $\frac{1}{4}$ -in. to prevent adjacent wires from shorting together. Match and connect wires to terminals on the thermostat. See Fig. 2-9.

⚠ CAUTION

Improper wiring or installation may cause damage to the thermostat. Check to ensure wiring is correct before proceeding with installation of unit.

9. Push excess wiring into wall. Seal hole in wall to prevent drafts.
10. Close thermostat door.
11. Turn on power to unit. The thermostat will receive power from the unit. The thermostat will be powered by 24 v, nominal (18 to 30 vac) through terminal R (+ 24 v) and terminal C (common). Power consumption is 5 va at 24 vac.
12. On power up the thermostat display shows the selected setup mode (A2 — Air Conditioner, H2 — Heat Pump) for a few seconds, depending on DIP switch settings.

Step 4 — Space Temperature Averaging — Applications that require averaging using multiple space temperature sensors can be satisfied using either 4 or 9 sensors as shown in Fig. 10. For single space temperature sensor wiring, refer to the base unit installation instructions. Temperature sensor calibration can be checked by measuring actual resistance at a temperature with an ohmmeter and comparing to the values listed in Table 1.

NOTE: Only Carrier sensors (part no. ZONECCORRS01) may be used for standard space temperature sensor averaging. Sensors must be used singly or in multiples of 4 and 9, with total sensor wiring not to exceed 1000 feet.

Step 5 — Set Thermostat Configuration — Configuration options, like DIP switch settings, are intended to be selected at installation and are not normally modified by the user. These options are not discussed in the owner's manual and must be done as part of the installation. A special procedure for the thermostat allows entry into the Configuration mode. To enter Configuration mode, press and hold the Fan button for approximately 10 seconds. The room temperature display will disappear and the configuration option number will be displayed on the thermostat screen. The configuration option number will be flashing and can be changed with the Up and Down buttons. Once the desired configuration option

is displayed, press the Set Time/Temp button to configure the option. See Table 2. The Option number will stop flashing and the configuration value will flash. Change the configuration value with the Up and Down buttons. Press the Set Time/Temp button again to save the configuration and change a different configuration. Press the End button to exit Configuration mode. The thermostat will automatically exit Configuration

mode if no button is pressed for 3 minutes. Twelve different configurations can be set in Configuration mode.

NOTE: When setting the configuration on the thermostat, the configuration "on" is displayed as ON, and the configuration "off" is displayed as OF.

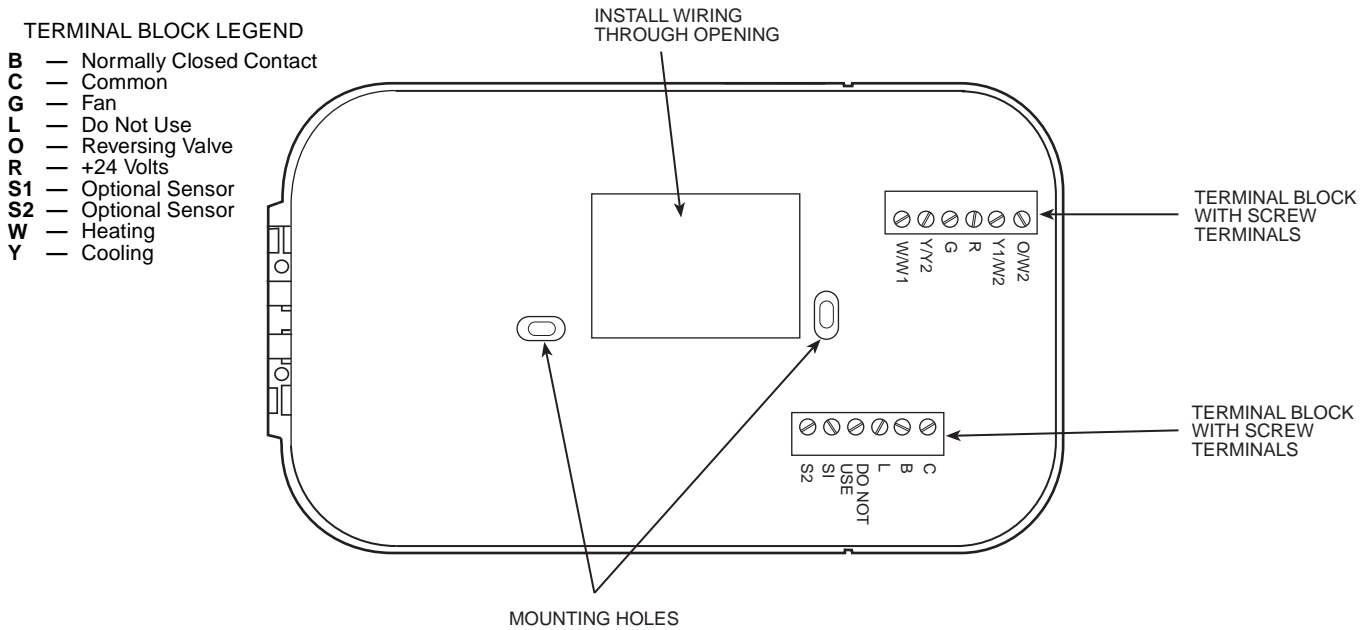


Fig. 1 — Commercial Programmable Thermostat Wiring and Installation

Table 1 — Temperature Sensor Resistance vs Temperature Values

TEMPERATURE		OHMS
F	C	
30	-1	34,480
32	0	32,630
34	1	30,760
36	2	29,220
38	3	27,470
40	4	26,020
42	6	24,680
44	7	23,320
46	8	22,070
48	9	20,910
50	10	19,830
52	11	18,820
54	12	17,870
56	13	16,920
58	14	16,160
60	16	15,260
62	17	14,530
64	18	13,790
66	19	13,090
68	20	12,480
70	21	11,860
72	22	11,270
74	23	10,750

TEMPERATURE		OHMS
F	C	
76	24	10,250
78	26	9,750
80	27	9,300
82	28	8,840
84	29	8,432
86	30	8,042
88	31	7,668
90	32	7,310
92	33	6,993
94	34	6,661
96	36	6,368
98	37	6,085
100	38	5,811
102	39	5,571
104	40	5,313
106	41	5,088
108	42	4,869
110	43	4,660
112	44	4,450
114	46	4,268
116	47	4,091
118	48	3,918
120	49	3,750

Table 2 — Thermostat Configuration Options

CONFIGURATION NUMBER	DESCRIPTION	RANGE	DEFAULT
01	Anticipator Setting	1 to 9	3
02	Clean Filter Setting	OF, 1 to 9	2
03	English/Metric Setting	F, C	F
04	Fan (G Terminal) on with Heat Relay	OF, On	On
05	S1, S2 used for Outdoor Air or LAT Sensor	od, LA	od
06	Cooling Lockout Temperature	OF, 20 to 60 F	OF
08	Auxiliary Heat Lockout Temperature	OF, 5 to 55 F	OF
13	Local Temperature Sensor Calibration	-5 to 5 F	0° F
18	Override Hours	1 to 6 hours	3 hours
19	Remote Temperature Sensor Calibration	-5 to 5 F	0° F
20	Allow Continuous Fan During Unoccupied Periods	OF, On	On
21	Keypad Lockout	OF, On	OF

LEGEND

LAT — Leaving Air Temperature

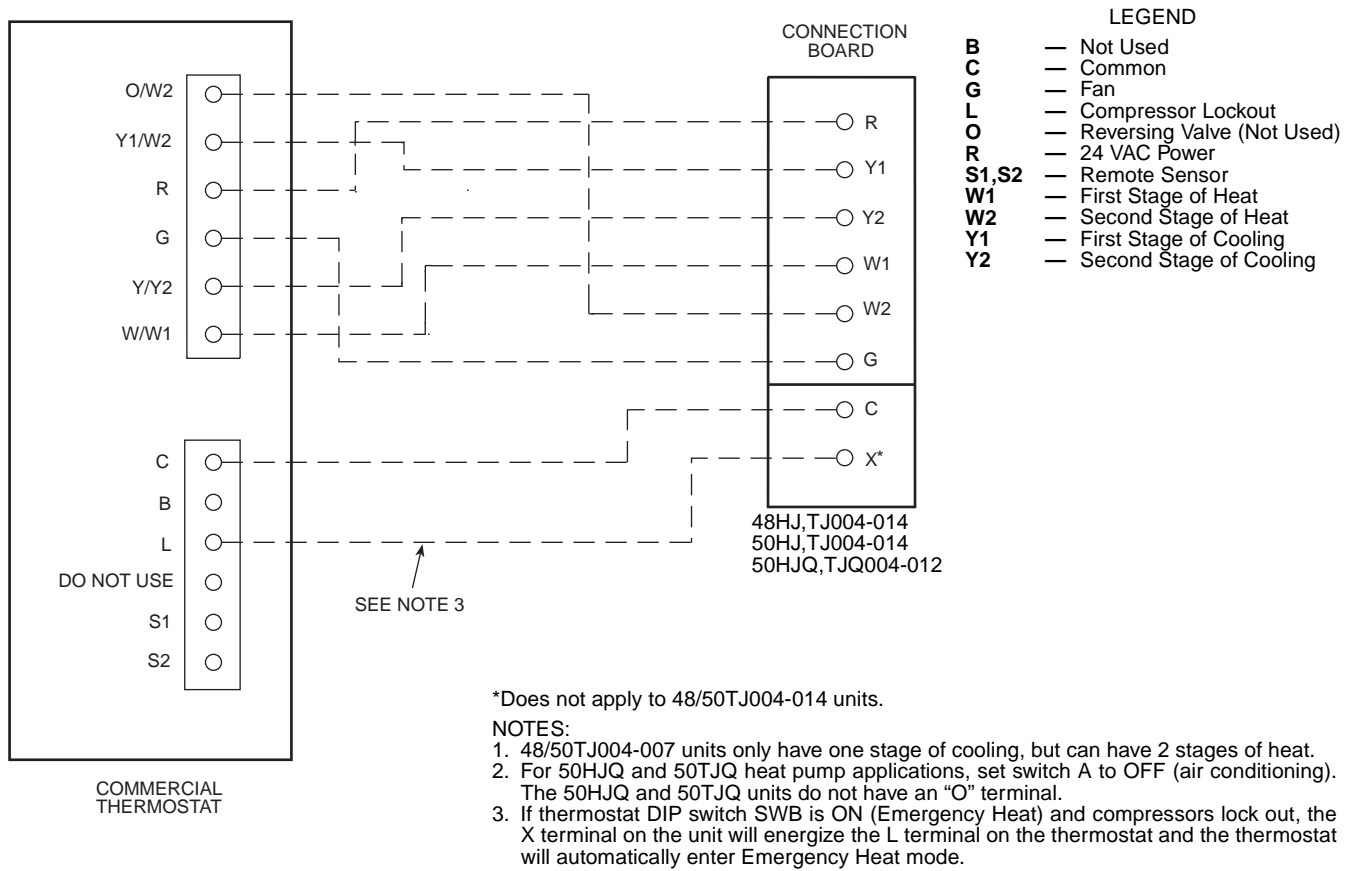


Fig. 2 — Thermostat Wiring (48/50HJ,TJ004-014; 50HJQ004-012; and 50TJQ004-012)

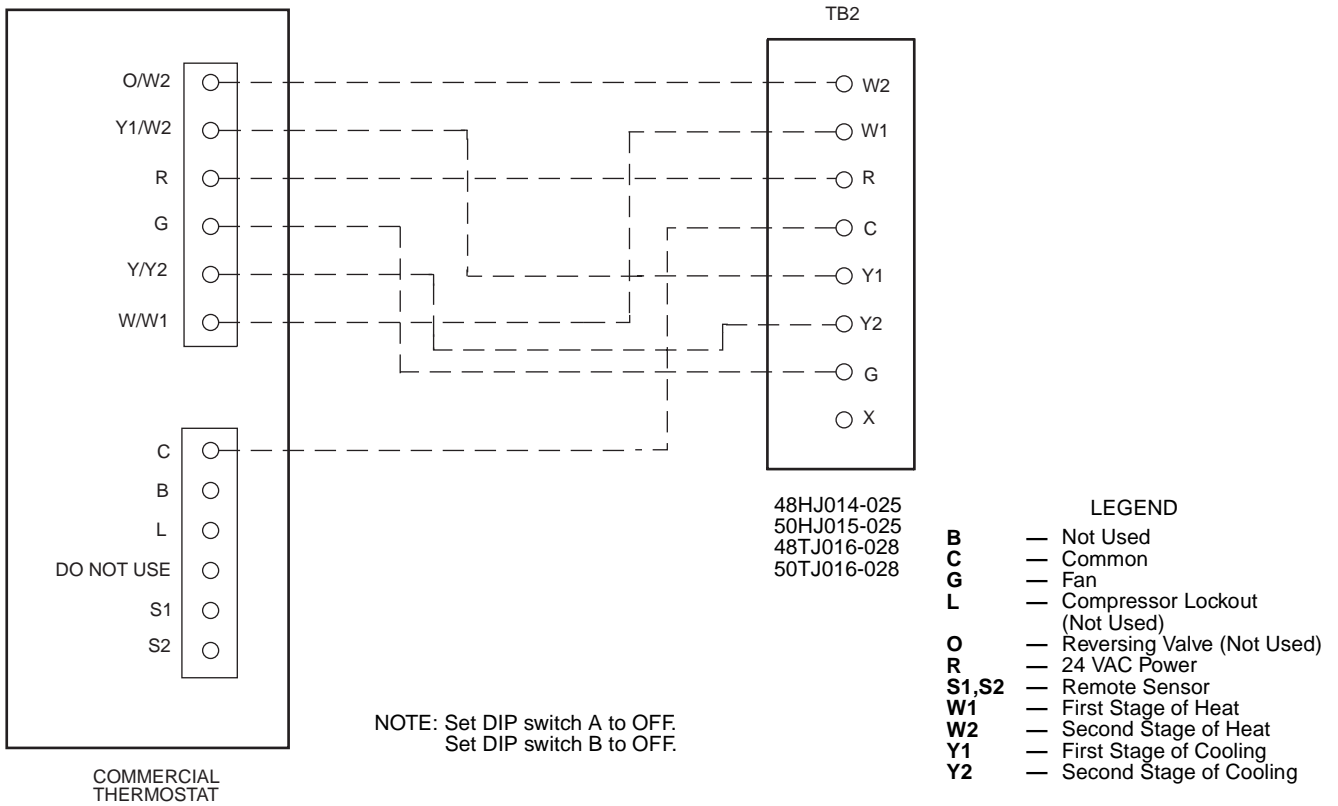


Fig. 3 — Thermostat Wiring (48/50HJ015-025 and 48/50TJ016-028)

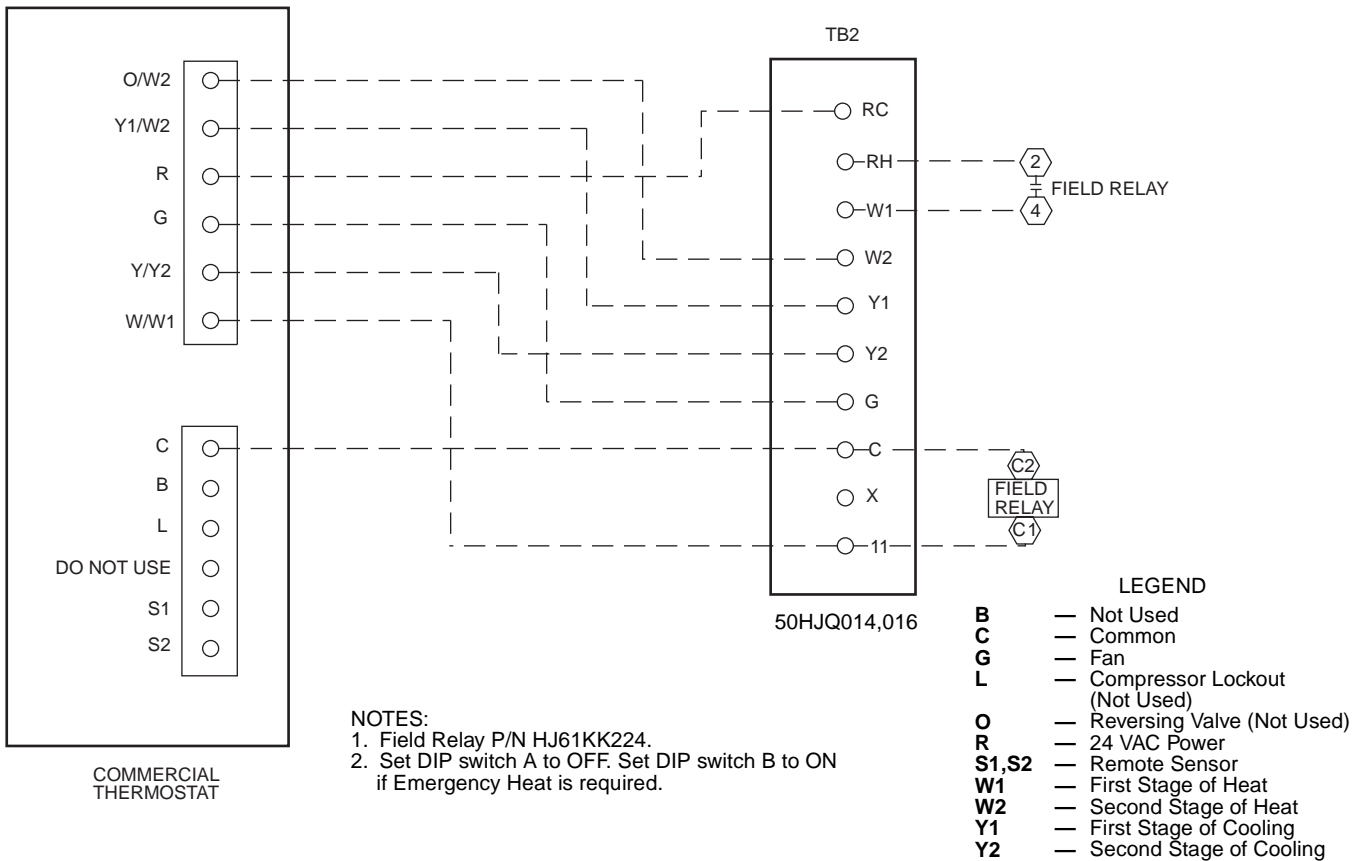


Fig. 4 — Thermostat Wiring (50HJQ014,016)

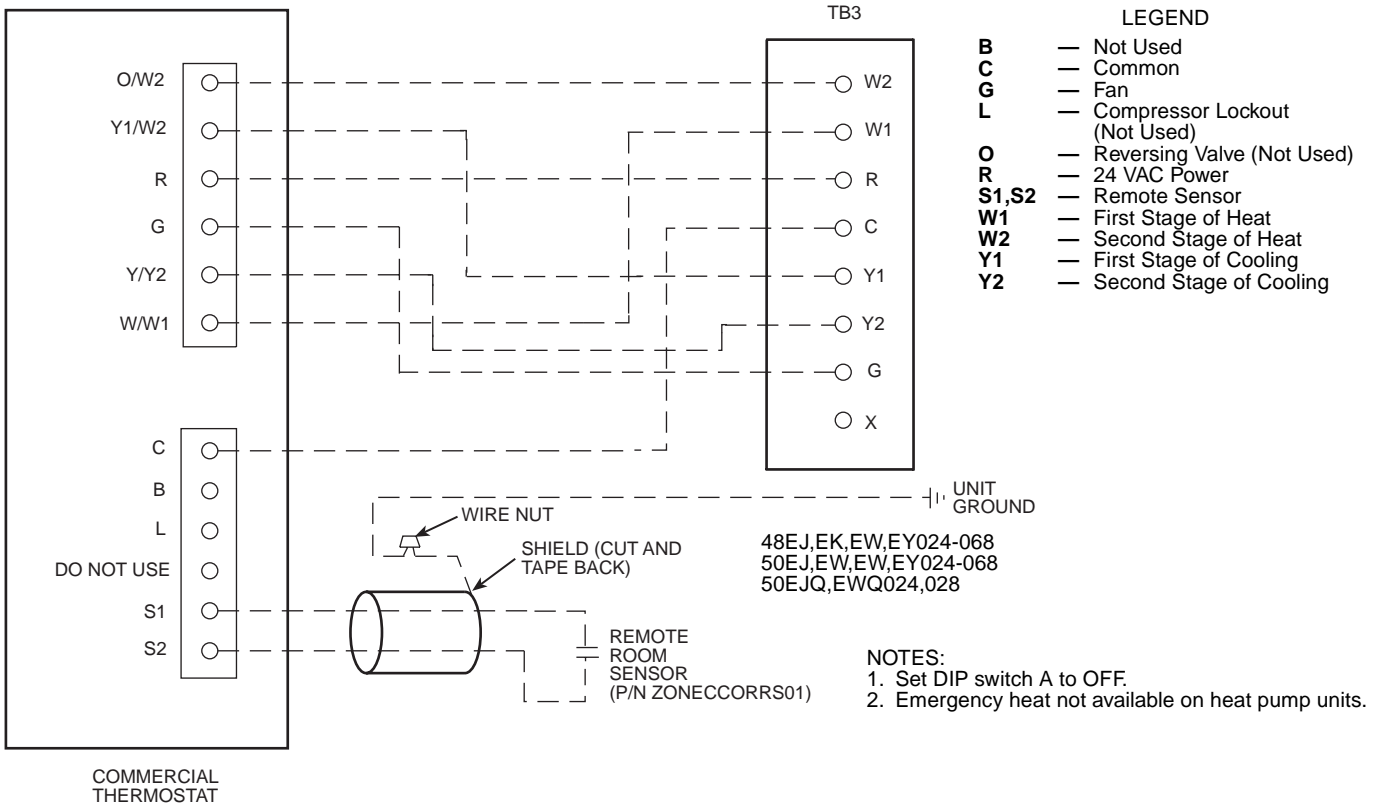


Fig. 5 — Thermostat Wiring (48/50EJ,EK,EW,EY024-068 and 50EJQ,EWQ024,028)

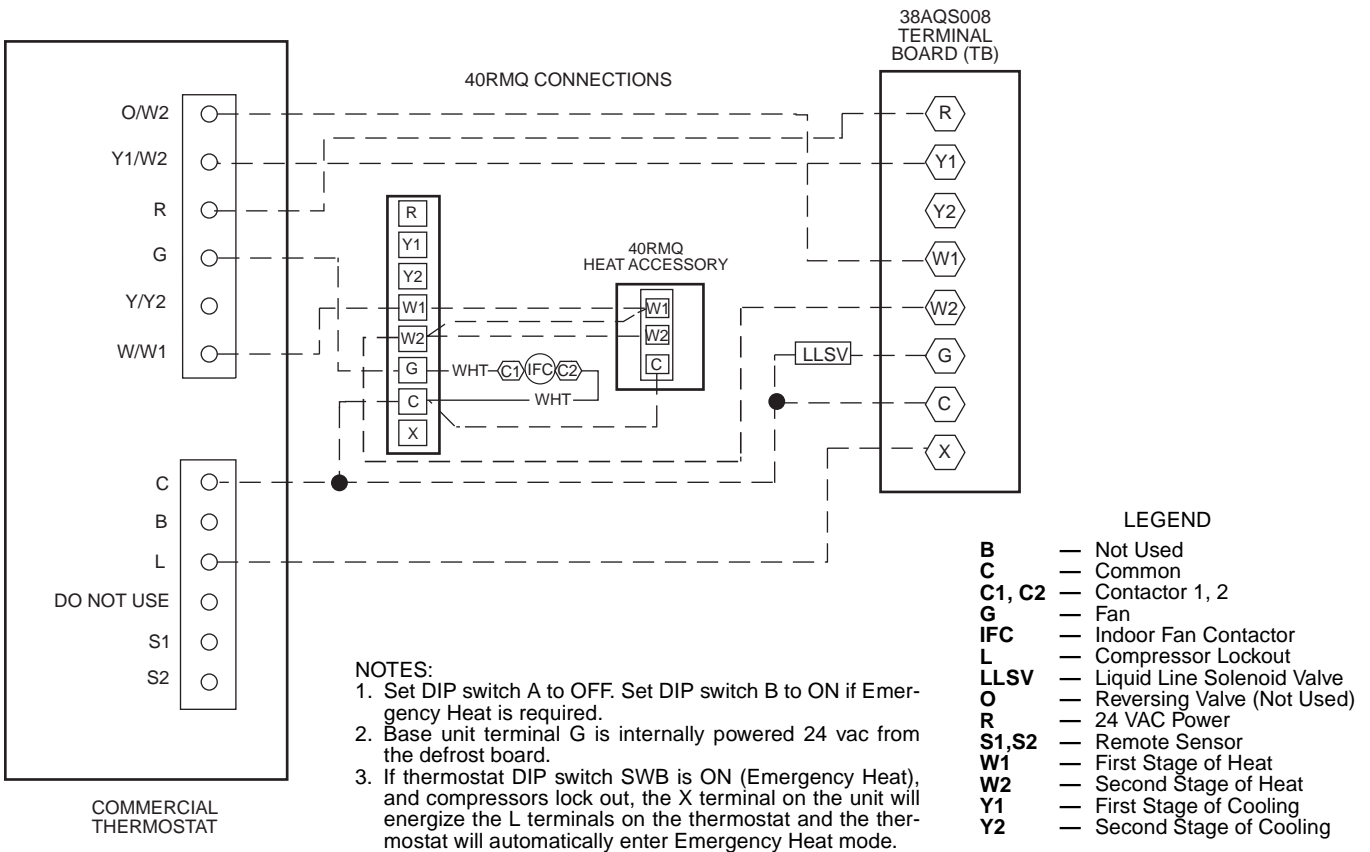


Fig. 6 — Thermostat Wiring (38AQS008)

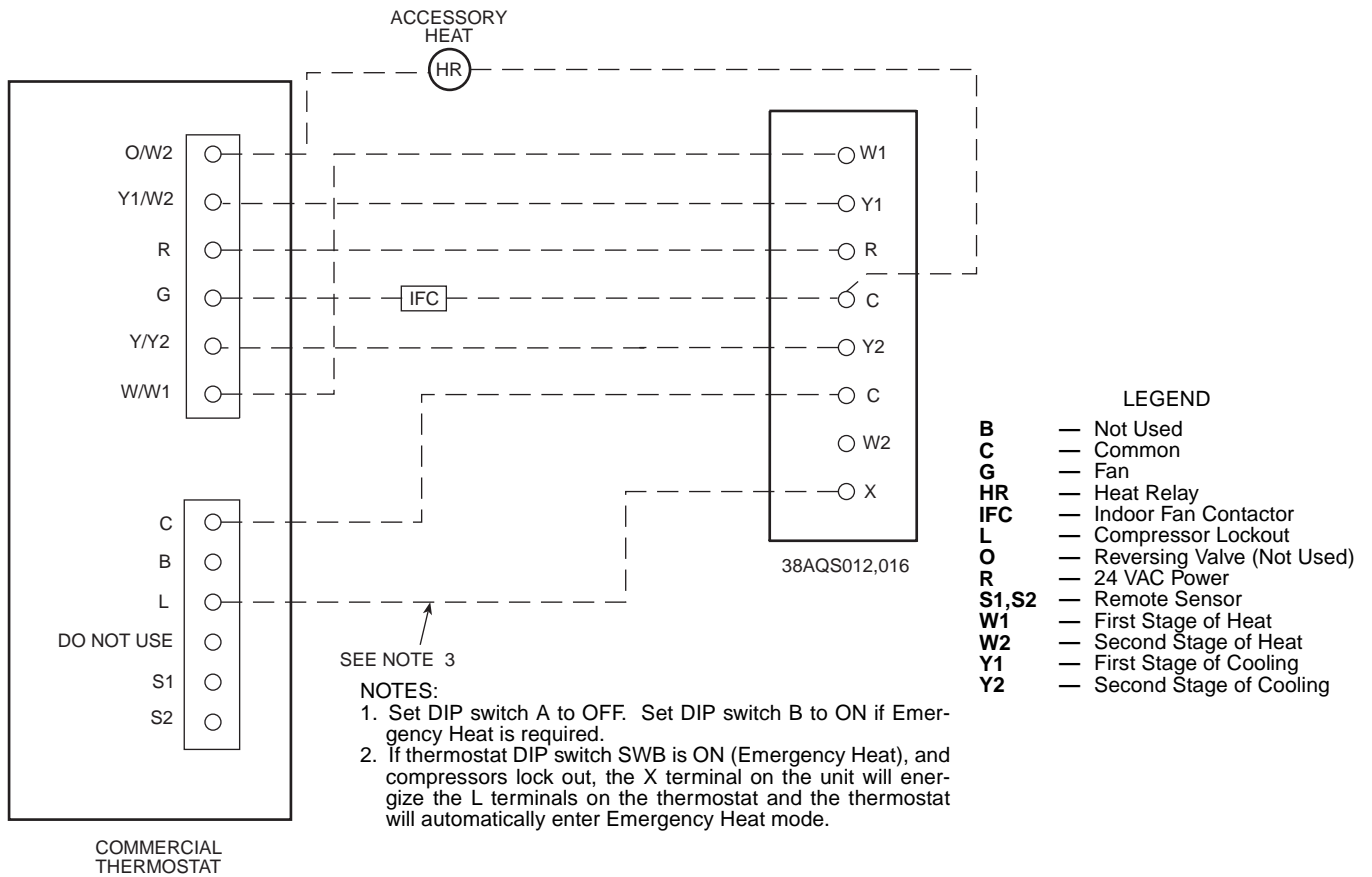


Fig. 7 — Thermostat Wiring (38AQS012,016)

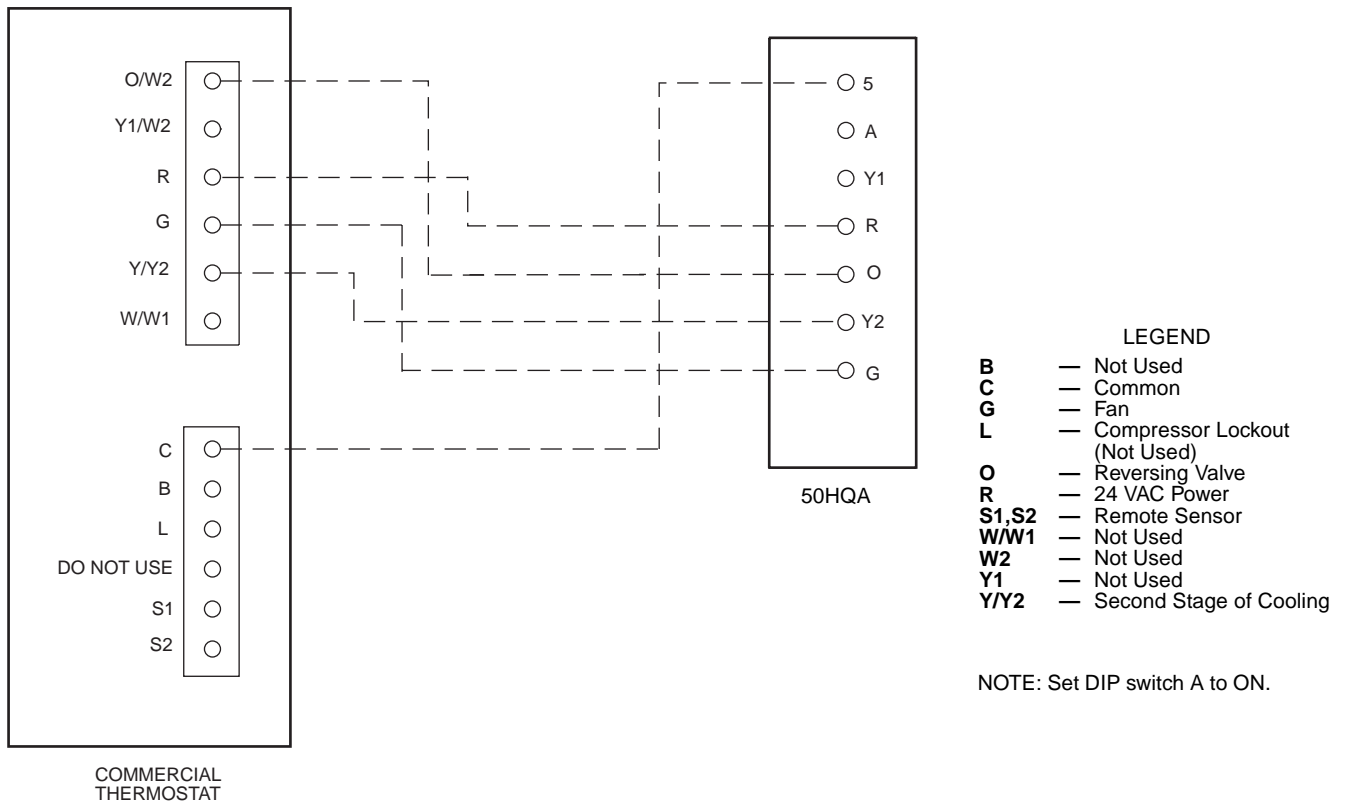


Fig. 8 — Thermostat Wiring (50HQA)

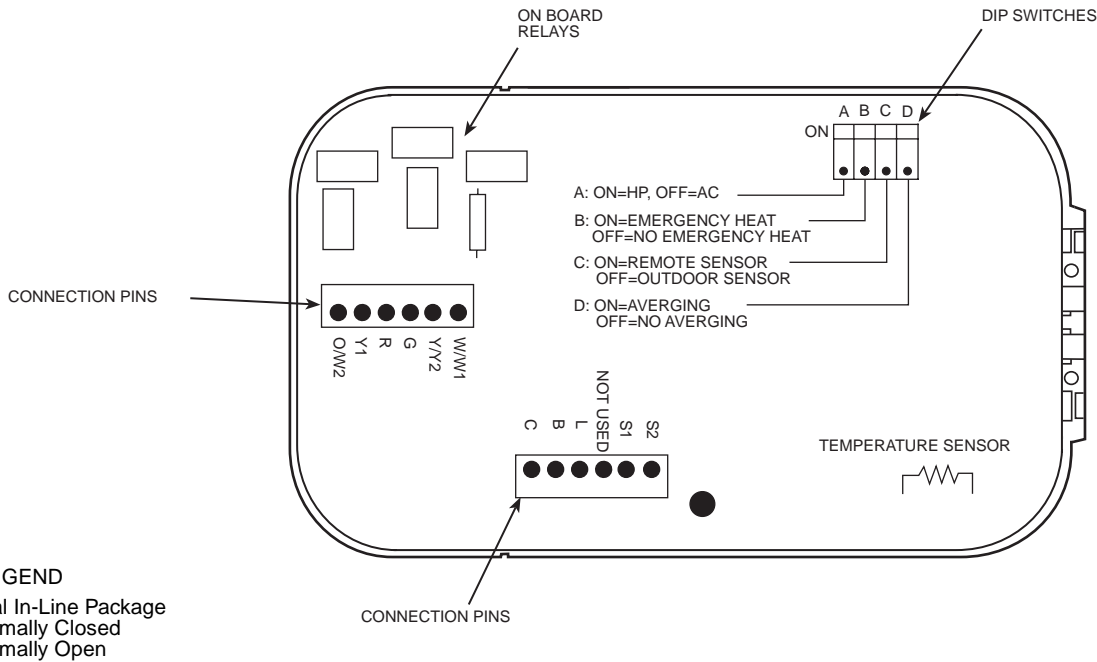


Fig. 9 — Commercial Programmable Thermostat Circuit Board Component Layout

ANTICIPATOR ADJUSTMENT SELECTION (01) — The anticipator adjustment controls the sensitivity and cycle rate of the thermostat. Higher numbers decrease the sensitivity and slow the cycle rate (longer cycle times). Lower numbers increase sensitivity and speed up the cycle rate (shorter cycle times). Values can range from 1 to 9. The default is 3. The default selection will provide optimum performance in nearly all installations. Do not change the setting unless there is a need to do so. Use the Up and Down buttons to increase or decrease the value.

Unlike conventional thermostat anticipators, the setting is not determined by current draw. There is no need to measure, know, or compensate for the current. There is no need to “droop” with this thermostat, regardless of the anticipator setting.

CLEAN FILTER TIMER SELECTION (02) — The clean filter selection determines how many hours of fan operation will pass before the Clean Filter icon is displayed. A timer in the thermostat accumulates the total fan operation hours. The range of values is 400 to 3600 hours (in 400-hour increments).

- a “1” will be displayed for 400 hours of operation
- a “2” will be displayed for 800 hours of operation
- a “3” will be displayed for 1200 hours of operation
- a “4” will be displayed for 1600 hours of operation
- a “5” will be displayed for 2000 hours of operation
- a “6” will be displayed for 2400 hours of operation
- a “7” will be displayed for 2800 hours of operation
- a “8” will be displayed for 3200 hours of operation
- a “9” will be displayed for 3600 hours of operation

The selection can also be set to OF (disabled). Use the Up and Down buttons to change the setting. The default is 2 (800 hours).

NOTE: During the selection procedure, the Clean Filter icon will be displayed, even if OF (disabled) is chosen.

FAHRENHEIT OR CELSIUS SELECTION (03) — The thermostat can be set to use a Celsius or Fahrenheit temperature display. Use the Up and Down buttons on the thermostat to change the setting between F (Fahrenheit) and C (Celsius). The default value is F.

FAN ON OR OFF WHEN HEAT IS ENERGIZED SELECTION (04) — The thermostat can be set to turn the fan (G output) on or off when the heat input (terminal W) is energized. Use the Up and Down buttons to toggle between OF (fan off during heating) and ON (fan on during heating). The default value is ON. The W relay option only cycles the fan when the fan is in the Auto Mode and the “Fan ON When Heat Energized” option is configured to ON.

THERMOSTAT SENSOR CONNECTIONS USAGE (05) — The thermostat provides a sensor wiring connection (terminals S1 and S2). The thermostat sensor connections usage configuration is only available if the thermostat Outdoor Air or Remote Room Sensor Switch (Switch C) is set to OFF (outdoor air sensor).

The configuration can be set either to “od” or “LA”. The default is “od.”

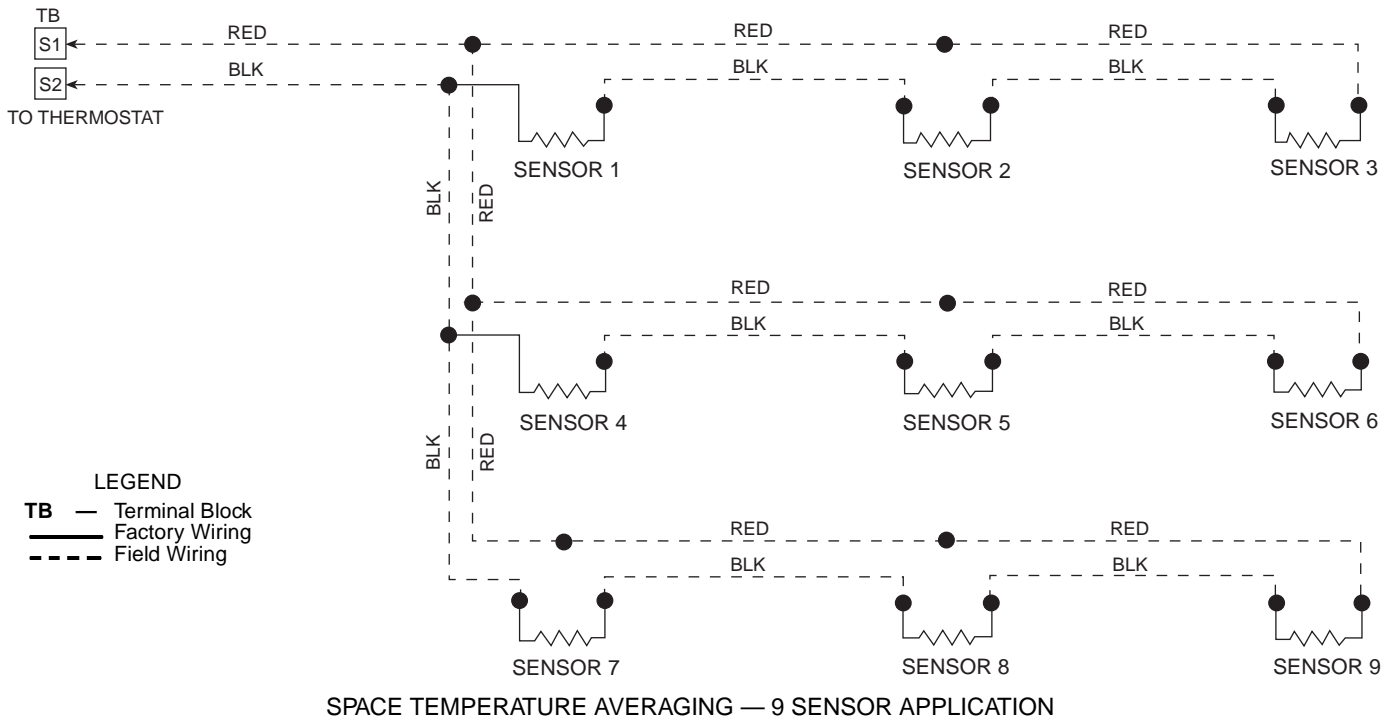
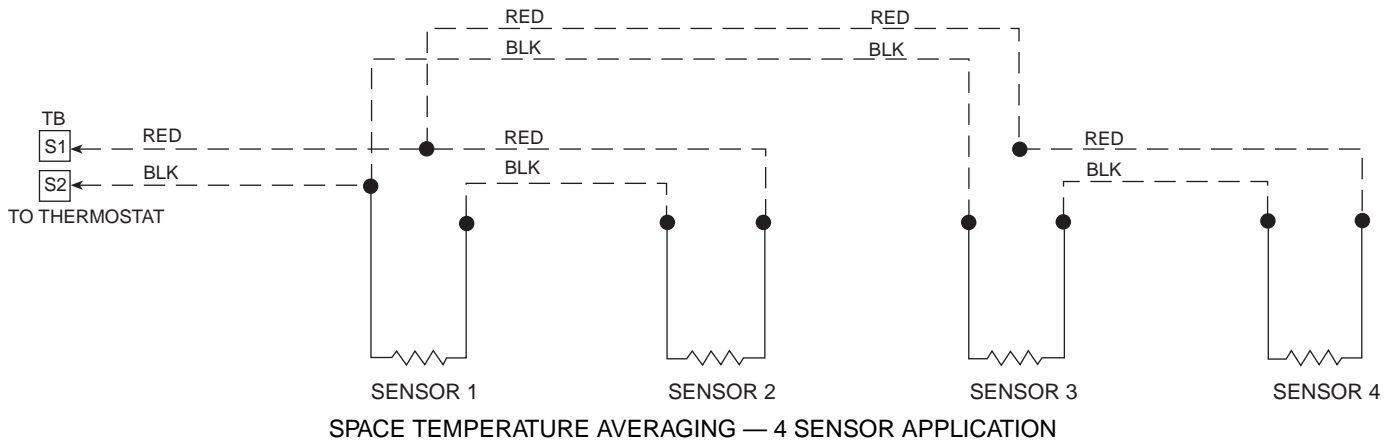
When the configuration is set to “od” and an outdoor-air temperature sensor is present (wired to S1 and S2), the thermostat will display outdoor-air temperature when the Up and Down buttons are pressed simultaneously. The letters “od” will be displayed at the same time. The display will return to normal after 4 seconds.

When the configuration is set to “LA” and a leaving-air temperature sensor is present (wired to S1 and S2), the thermostat will display leaving-air temperature when the Up and Down buttons are pressed simultaneously. The letters “LA” will be displayed at the same time. The display will return to normal after 4 seconds.

LOW AMBIENT COOLING LOCKOUT SELECTION (06) — The Low Ambient Cooling Lockout Feature will lock out Cooling mode if the outdoor-air temperature is below the lockout cooling temperature (user-configured).

NOTE: This configuration is not available if DIP switch C (Remote Room Sensor) is set to ON or if the outdoor air sensor is in error. Also configuration 05 (Thermostat Sensor Connection Usage) must be set to “od”.

The default is OF (disabled). The lockout temperature can be set to OF (disabled) or 20 to 60 F in 5-degree increments



LEGEND
TB — Terminal Block
 ——— Factory Wiring
 - - - Field Wiring

Fig. 10 — Space Temperature Averaging

(enabled). Use the Up and Down buttons to increase or decrease the setting.

HIGH AMBIENT ELECTRIC HEAT LOCKOUT SELECTION (08) — If DIP switch A is set to ON (heat pump) and DIP switch C is set to OFF (an outdoor temperature sensor is present), electric heat can be locked out if the outdoor ambient temperature rises above the user-defined value. Also, Configuration 05 (Thermostat Sensor Connection Usage) must be set to “od.” Temperatures of 15 to 55 F (in 5-degree increments) can be selected. The lockout can also be disabled. The default is OF (disabled). Emergency Heat mode disables this function. Use the Up and Down buttons to increase or decrease the setting.

LOCAL TEMPERATURE SENSOR CALIBRATION (13) — The local Temperature Sensor Calibration is an offset which is added or subtracted from the local temperature sensor reading. The range of acceptable values is -5 to 5 F. The default is 0° F (no offset).

To determine if an offset is required, compare the temperature reading on the thermostat to an accurate thermometer.

Adjust the offset (+ or -) until the thermostat temperature matches room temperature.

OVERRIDE HOURS (18) — The Override Hours configuration determines the number of hours that set point override will last. The range of acceptable values is 1 to 6. The default is 3. Set point override is activated by pressing the Occupied button or by changing the set point with the Up or Down buttons. If the schedule changes while the override time is still active, the override is cancelled.

REMOTE TEMPERATURE SENSOR CALIBRATION (19) — The Remote Temperature Sensor Calibration is an offset which is added or subtracted from the remote temperature sensor reading. The range of acceptable values is -5 to 5 F. The default is 0° F (no offset).

To determine if an offset is required, compare the remote temperature reading on the thermostat to an accurate thermometer placed near the remote sensor. Adjust the offset (+ or -) until the thermostat temperature matches the measured temperature.

ALLOW CONTINUOUS FAN DURING UNOCCUPIED HOURS (20) — The fan can be configured by the user to run continuously (set to ON) or only during heating or cooling (set to AUTO). When the fan is set to ON (run continuously), the Allow Continuous Fan During Unoccupied Hours configuration determines whether the fan will run during unoccupied periods when heating or cooling is not active.

When the configuration is set to ON and the fan is set to ON, the fan will run continuously during unoccupied periods, even when heating or cooling is not active.

When the configuration is set to OF, the fan will run during unoccupied periods only when heating or cooling is active.

The default is On.

KEYPAD LOCKOUT SELECTION (21) — The thermostat has a lockout feature which will not acknowledge configuration buttons until the lockout code is entered. After the lockout code has been entered, the keypad will remain unlocked until the user has stopped pressing keys for 2 minutes. The Lockout selection can be set to ON or OF (disabled). Use the Up or Down buttons to toggle between off and on. The default is OF.

NOTE: If the Lockout is enabled, the lockout code is as follows, in sequence, within a 10-second time period: Mode button, Copy Previous Day button, Set Time/Temp button, and Hold button.

Step 6 — Check Thermostat Operation — Perform the following procedure to check thermostat operation:

1. Press the Hold button. This will prevent the set point from changing until the desired time and temperature schedule is entered.
2. Press the Fan button to switch the fan annunciator from AUTO to ON. The fan should run continuously. Check fan operation. Press the fan button again to switch back to AUTO.

NOTE: If fan does not run check set up option 20 configuration. Fan may not run during unoccupied times in schedule.

3. Press the Mode button repeatedly until HEAT is displayed in the mode annunciator. Press the Set Time/Temp button until the heat set point annunciator is flashing. Press the Up button until the set point reads 10 degrees above room temperature. The heating system should begin to operate within 5 minutes.
4. Press the Mode button repeatedly until COOL is displayed in the mode annunciator. Press the Set Time/Temp button until the heat set point annunciator is flashing. Press the Down button until the set point reads 10 degrees below room temperature. The cooling system should begin to operate within 5 minutes.

Step 7 — Select Thermostat Operation Settings — Thermostat operation should be configured. Set the Fan and Mode configurations to their desired settings.

Press the Up and Down buttons to select the desired comfort temperature.

Step 8 — Set Current Time — The Set Time/Temp button allows the user to change the time displayed on the thermostat. Press the Set Time/Temp button. The display will show the blinking TIME annunciator. Press the Up and Down 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 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 End button to exit the Set Time mode.

Step 9 — Set Current Day — The Change Day button will change the day shown on the thermostat display to the next day. If a schedule has been entered, the thermostat will follow the schedule of the new selected day.

Step 10 — Programming Thermostat Schedules — Before programming the thermostat, plan the thermostat daily schedule. The schedule is divided into 7 days (Monday through Sunday). Each day has 4 time periods (OC1, UN1, OC2, UN2). Each time period has a start time, heating set point, and cooling set point. Fill in Table 3 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 the Program button. The PROGRAMMING annunciator will appear on the thermostat display. The current day of the schedule will be displayed and the current programming time period of that day will be displayed. The TIME annunciator will flash.

NOTE: If a programming button is not pushed for 3 minutes, the thermostat will exit programming mode and any changes made will be saved.

2. Press the Up and Down buttons to set the start time for the schedule day and period shown.
3. Press the Set Time/Temp button once the correct time is shown. The TIME annunciator will stop flashing and the HEAT annunciator will start flashing.
4. The heating and cooling set points can now be programmed. The HEAT and COOL annunciators are displayed for the heating and cooling set points respectively. The Set Time/Temp button is used to toggle between the heating and cooling set points and the time. Use the Up and Down buttons to raise and lower the temperature set points.

NOTE: There must be at least 3 degrees difference between the cooling and heating set points. The thermostat will automatically change any set points closer than 3 degrees.

Table 3 — Daily Schedule Planner

DAY OF WEEK	SCHEDULE			
	OC1	UN1	OC2	UN2
	Time / Heat / Cool	Time / Heat / Cool	Time / Heat / Cool	Time / Heat / Cool
Monday	/ / /	/ / /	/ / /	/ / /
Tuesday	/ / /	/ / /	/ / /	/ / /
Wednesday	/ / /	/ / /	/ / /	/ / /
Thursday	/ / /	/ / /	/ / /	/ / /
Friday	/ / /	/ / /	/ / /	/ / /
Saturday	/ / /	/ / /	/ / /	/ / /
Sunday	/ / /	/ / /	/ / /	/ / /

NOTE: The cooling temperature set point must be at least 3 degrees higher than the heating temperature set point.

5. Press the Program button to advance to the next time period.
6. Perform Steps 2 through 5 until the times and temperature set points have been entered for the entire day. Press the Change Day button to move to the schedule for the next day.
7. Repeat Steps 2 through 6 to program the remaining schedule days. The Copy Previous Day button can be used to copy the previous day's schedule if the schedules are the same.
8. After all the times and set points for each day have been entered, press the End button to finish entering the schedule.

NOTE: The thermostat will continue to follow the schedule until a new one is entered. The schedule may need to be updated for different seasons or prolonged changes in temperature.

OVERRIDING THE SCHEDULE — The schedule can be overridden in three ways, the Hold button can be pressed to lock in the current temperature setting, the Up or Down buttons can be pressed to change the desired temperature or the Occupied button can be pressed. The thermostat will use the new set point until the next scheduled time period starts. Hold is indefinite and will remain in effect until the Hold button is pressed again.

The Occupied button is only active during unoccupied time periods. When the Occupied button is pressed, the heating and cooling set points change to the OC1 settings and remain active until the next time period or until the number of override hours expires, whichever ever happens first.

Step 11 — Final Checklist

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

OPERATION

Hold, Fan, and Mode Button Operation —

Pressing the Hold button disables the time and temperature schedule and holds the current desired temperature set point. When a Hold is active, the HOLD annunciator is displayed on the thermostat screen. To release the Hold, press the Hold button a second time.

The Fan button selects fan operation. When the fan is set to ON, the fan will run continuously. When the fan is set to AUTO, the fan will run during heating and cooling operation only.

If the fan is set to ON, but the Allow Continuous Fan During Unoccupied Hours configuration is set to OF, the fan will not run during unoccupied hours when heating or cooling is not active. A small triangle will be displayed next to the Fan On icon to show the user that the fan is not running because of the unoccupied time period.

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. Heat pumps also have an EHEAT selection. When DIP Switch B (Emergency Heat Selection) is set to ON, the EHEAT mode is available on the thermostat. If EHEAT is selected and there is a heating demand, the thermostat will turn on the O/W2 output when the AC/HP DIP

Switch (A) is set to the AC position or O/W2 output when the AC/HP DIP Switch (A) is set to the HP position. The annunciator for each selection will be displayed on the thermostat when selected.

Display Outdoor-Air or Leaving-Air Temperature —

When the Up and Down buttons are pressed at the same time, the display will show the temperature of the sensor wired to the thermostat at S1 and S2. The temperature is displayed for 4 seconds with the letters "od" or "LA." The display then returns to normal. If a sensor is not connected, DIP Switch C (Remote Room Sensor) is set to ON, or the reading is out of range, then "--" is displayed.

The valid temperature range for the outdoor-air sensor is -38 to 145 F. The valid temperature range for the leaving-air sensor is -38 to 145 F.

Thermostat Output Assignments — The thermostat output assignments, based on configuration, are shown in Table 4.

Five-Minute Compressor Short-Cycle Protection —

The timer prevents the compressor from starting until it has been off for at least 5 minutes. The 5-minute timer can be disabled (for one cycle only) by simultaneously pressing the Fan button and the Up button.

Fifteen-Minute Staging Timer —

When multi-stage heating or cooling is used, the staging timer prevents any higher stage from energizing until at least 15 minutes has passed from the start of the previous stage. The timer is disabled if the temperature demand is greater than 5 degrees.

Three-Minute Minimum On Time — In normal operation, when a stage is energized, it must remain on for at least 3 minutes.

Heating/Cooling Set Point Minimum Difference —

A minimum difference of 3 degrees is enforced between the heating and cooling set points. The thermostat will not allow the set points to be set within 3 degrees of each other.

Auto-Changeover Timer —

When the auto-changeover mode is selected, the thermostat will not change from heating to cooling or cooling to heating until an opposite demand has existed for a minimum of 10 minutes. The timer is disabled if the heating or cooling set point is changed.

Power-On Thermostat Check —

When power is applied to the thermostat, all possible display annunciators are turned on for a few seconds. The thermostat then indicates the current mode and configuration information with a 2-digit code. The following codes can be displayed: A2 — two-stage air conditioner, and H2 — two-stage heat pump.

Error Codes — The thermostat will display the following error codes if errors are detected:

-- — If the thermostat cannot properly read room temperature, the thermostat will display an "--" and all outputs (except the fan if on), will be deenergized.

E2 — If the AC line voltage drops below the minimum level, all outputs are deenergized and the thermostat will display an E2. The E2 error will remain until proper line voltage has been restored for at least 15 seconds. If the line voltage is completely interrupted, the thermostat display will immediately go blank

E3 — If the outdoor temperature sensor is in error, an E3 error will be displayed.

E7 — If the L terminal on the thermostat is energized, the compressor on the HVAC unit is locked out. An E7 error will be displayed whenever the compressor is locked out.

Smart Recovery (Heating Mode Only) — The thermostat has 2 programmed schedule modes, Normal Occupied mode and Setback mode (a time when the space is unoccupied). The Smart Recovery function begins 1.5 hours before the Scheduled Occupied mode and gradually adjusts room temperature so the temperature is at the Occupied mode set point when the occupied time period begins.

The Smart Recovery Function operates any time the next programmed heating set point is more than 2 degrees above the current heating set point.

Smart Recovery will not occur if Hold is active. Smart Recovery will also be cancelled if the heating set point or time of day are changed.

Table 4 — Thermostat Output Assignments

DIP SWITCH CONFIGURATION	COOLING STAGE 1	COOLING STAGE 2	HEATING STAGE 1	HEATING STAGE 2	HEATING STAGE 3	EMERGENCY HEAT
Unit Type						
AC	Y1/W2	Y1/W2, Y/Y2	W/W1	W/W1, O/W2	N/A	O/W2
HP	Y1/W2, O/W2	Y1/W2, Y/Y2, O/W2	Y1/W2	Y1/W2, Y/Y2	W/W1, Y1/W2, Y/Y2	W/W1

LEGEND

- AC — Air Conditioner
- DIP — Dual In-Line Package
- HP — Heat Pump
- N/A — Not Available
- N/C — Normally Closed
- N/O — Normally Open

NOTES:

1. Heating stage 3 is only for heat pump applications.
2. All relays except where noted are N/O, dry contacts.

TROUBLESHOOTING

PROBLEM	SOLUTION
LCD display on thermostat not illuminated	Check for 24 vac between R and C at terminal connections. Both R and C must be connected for proper thermostat operation.
“E2” displayed on thermostat	Brownout condition or voltage is too low to thermostat. Check wiring and check for 24 vac at R and C. The E2 error will clear 15 seconds after acceptable power levels are restored.
“--” displayed on thermostat	Temperature sensor reading is out of range. Check the sensor for damage. Check sensor wiring. Cycle power to thermostat. If display is not cleared, replace the thermostat
“Clean Filter” is displayed on thermostat	After the configured number of blower operating hours, the Clean Filter message will be displayed. This reminds the owner to replace the filter. Press the Reset Filter button to reset the blower operation timer to 0 hours.
“E3” displayed on thermostat	If the outdoor thermostat is in error, not connected, or shorted, “E3” will be displayed. Check outdoor thermostat wiring and replace if necessary.
“E7” displayed on thermostat	L signal is present, locking out compressor operation.
Cooling will not energize	Select COOL mode. Decrease cooling set point to 10 degrees below room temperature. Simultaneously press Fan and Up buttons to disable timers. Check for 24 vac at Y/Y2 terminal. If present, thermostat is operating correctly and problem is with wiring or equipment. If 24 vac is not present, replace the thermostat.
Heating will not energize	Select HEAT mode. Increase heating set point to 10 degrees above room temperature. Simultaneously press Fan and Up buttons to disable timers. Check for 24 vac at Y/Y2 terminal (for heat pump) or W/W1 terminal (for gas/electric heat unit). If present, thermostat is operating correctly and problem is with wiring or equipment. If 24 vac is not present, replace the thermostat.

LEGEND

LCD — Liquid Crystal Display

NOTE: Unoccupied Override may be entered by shorting the remote room sensor for 3 to 10 seconds.