



INSTALLATION AND OPERATING INSTRUCTIONS

Residential Programmable Thermostats

Part No. P274-1100, 1200, 1300


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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 the 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

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

All programmable 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.

INSTALLATION CONSIDERATIONS

Models — There are 3 different models. Ensure the proper thermostat is selected for the intended application. Refer to Fig. 1 for thermostat dimensions. Select from the following models:

1. P274-1100 (air conditioner [AC]) — 1-stage cool, 1-stage heat for air-conditioning systems only
2. P274-1200 (heat pump [HP]) — 1-stage cool, 2-stage heat for either heat pump or air conditioner systems with 2-stage heat
3. P274-1300 (2-speed) — 2-stage cool, 2-stage heat for 2-speed AC systems, or 2-stage cool, 3-stage heat for 2-speed HP systems, or 1-stage cool, 4-stage heat for 1-speed HP with special 3-stage electric heat

Outdoor Temperature Sensing — All programmable thermostats can be equipped with an optional outdoor temperature sensor, part no. TSTATXXSEN01-B. If this option is to be installed, plan thermostat installation so that 2 wires can be run from the thermostat to an outdoor location. Refer to the installation instructions provided with the outdoor temperature sensor for necessary connections.

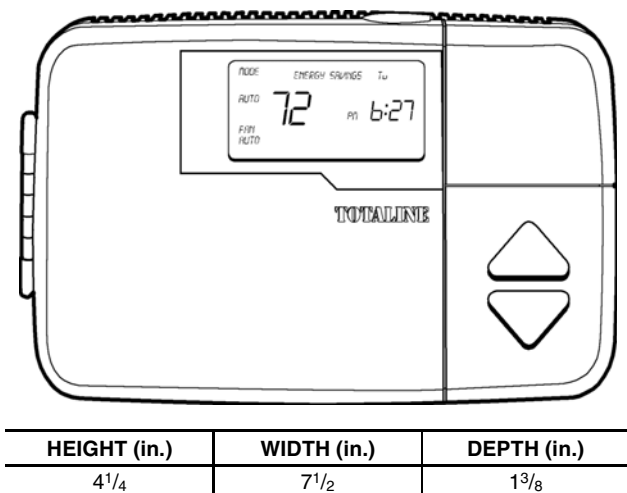


Fig. 1 — Totaline® Residential Programmable Thermostat

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

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 — To access the dual in-line package (DIP) switches, remove the thermostat door from the front and unhinge the back half of the thermostat from the front half.

There are 4 small DIP switches in the upper right 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 switches. The switch designation (A-D) is printed on the circuit board above the switches. 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 and record the settings on page 16. Once switches are set, do NOT reassemble the halves of the thermostat. The back half will be mounted to the wall.

ZONING SELECT — SWITCH A (Active on All Models) — Switch A controls the 4 cycles per hour limit and 5-minute compressor timeguard that **MUST** be enabled for normal operation. For zoning applications, turn the switch to ON and cancel the timers as the zone control center performs these timing functions.

TO SET:

- OFF — Normal operation, factory default
- ON — Zoned installations only

SETBACK RECOVERY — SWITCH B (Active on All Models) — Use Switch B to select either normal or smart recovery from setback. Normal recovery changes to the new set point at the programmed time. Smart recovery, which is active in heating mode only, starts earlier and adjusts the set point slowly so that room temperature will arrive at the programmed temperature at the programmed time.

TO SET:

- OFF — Smart recovery, factory default
- ON — Normal recovery

HP/AC SELECT — SWITCH C (Active on 1200 and 1300 Models Only) — Use Switch C to select between AC and HP installations. The 1200 and 1300 models have an extra relay to control the HP reversing valve. When a 1200 model thermostat is placed in AC mode, this extra relay is converted to a second stage heat output. This allows thermostat control of 2-stage furnaces or 2-stage strip heat with AC systems (AC mode wiring also uses W rather than Y for first-stage heat).

TO SET:

- OFF — HP applications (extra relay controls reversing valve), factory default
- ON — AC applications (extra output can be used for 2-stage heat)

INTELLIGENT HEAT STAGING SELECT — SWITCH D (Active on 1300 Models Only) — Use Switch D to convert a 2-speed heat pump thermostat with 1 stage of auxiliary heat into a 1-speed heat pump thermostat with 3 stages of auxiliary heat for additional heating capacity. It requires selected heaters with 2:1 ratio element sizes plus a variable-speed fan coil. Refer to fan coil literature for details.

TO SET:

- OFF — Normal 2-speed operation, factory default
- ON — Intelligent 3-stage heat with a variable-speed fan coil

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.

4. Turn off all power to unit.
5. If an existing thermostat is being replaced:
 - a. Remove the existing thermostat from the wall.
 - b. Disconnect wires from the existing thermostat. Do not allow the wires to fall back into the wall. As each wire is disconnected, record wire color and terminal connection.
 - c. Discard or recycle the old thermostat.

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

6. Locate the 2 mounting holes (1 on each side of the large hole) in the back half of the thermostat, which are already exposed from unhinging the front and back halves to set the DIP switches.
7. Route thermostat wires through the large hole in the back half of the thermostat. Remove the outer sheath from the wires for added flexibility. Standard solid or multi-conductor thermostat wire should be used from the thermostat to the base 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 space temperature sensor or outdoor-air sensor is used, an additional conductor should be provided for grounding of the shield.

⚠ CAUTION

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

8. Level the back half of the thermostat against the wall and mark the wall through the 2 mounting holes.
9. If needed, drill two $\frac{3}{16}$ -in. mounting holes in the wall where marked. Otherwise, use the previous thermostat's mounting holes already drilled.

⚠ CAUTION

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

10. Secure the back half of the thermostat to the wall with 2 screws and anchors provided. Ensure all wires exit through the large hole.
11. 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. Refer to Table 1 for correct model usage depending on intended application. Table 1 references

Fig. 2-24 for proper wiring depending on model no. and intended application.

⚠ CAUTION

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

12. Push excess wiring into the wall. Seal the hole in the wall to prevent drafts.
13. Snap the front and rear halves of the thermostat back together and snap the thermostat door back onto the front.
14. Turn on power to the 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.
15. On power up, the thermostat display shows the selected setup mode for a few seconds, depending on DIP switch settings:
 - AC — 1-speed air conditioner
 - HP — 1-speed heat pump
 - A2 — 2-speed air conditioner
 - H2 — 2-speed heat pump
 - HS — Intelligent heat staging with a variable-speed fan coil and 1-speed heat pump

Table 1 — Model No. and Proper Wiring for Intended Applications

MODEL NO.	APPLICATION	FIG. NO.
1100	Single-Speed AC with Single-Stage Furnace	2
	Single-Speed AC with 2-Stage or Variable-Speed Furnace	3
	Single-Speed AC with Typical Fan Coil (Single-Stage Heat Control)	4
	Single-Speed AC with Variable-Speed Fan Coil	5
	Single-Speed Packaged AC with Single-Stage Gas Furnace	6
	Single-Speed Packaged AC with Single-Stage Electric Heat	7
1200	Single-Speed AC with 2-Stage or Variable-Speed Furnace	8
	Single-Speed AC with Typical Fan Coil (Dual-Stage Heat Control)	9
	Single-Speed HP with Typical Fan Coil	10
	Single-Speed AC with Variable-Speed Fan Coil	11
	Single-Speed Packaged AC with 2-Stage Electric Heat	12
	Single-Speed Packaged HP with Single-Stage Electric Heat	13
	Single-Speed Packaged Heat Pump with 2-Stage Electric Heat	14
1300	Single-Speed Packaged HP with Single-Stage Gas Furnace	15
	2-Speed AC with Single-Stage Furnace	16
	2-Speed AC with 2-Stage or Variable Speed Furnace	17
	2-Speed AC with Typical Fan Coil	18
	2-Speed HP with Single-Stage Furnace	19
	2-speed HP with 2-Stage or Variable-Speed Furnace	20
	2-Speed HP with Typical Fan Coil	21
	2-Speed AC with Variable-Speed Fan Coil	22
	2-Speed HP with Variable-Speed Fan Coil	23
Single-Speed HP with Variable-Speed Fan Coil and Special 3-Stage Electric Heat	24	

LEGEND

- AC — Air Conditioner
- HP — Heat Pump

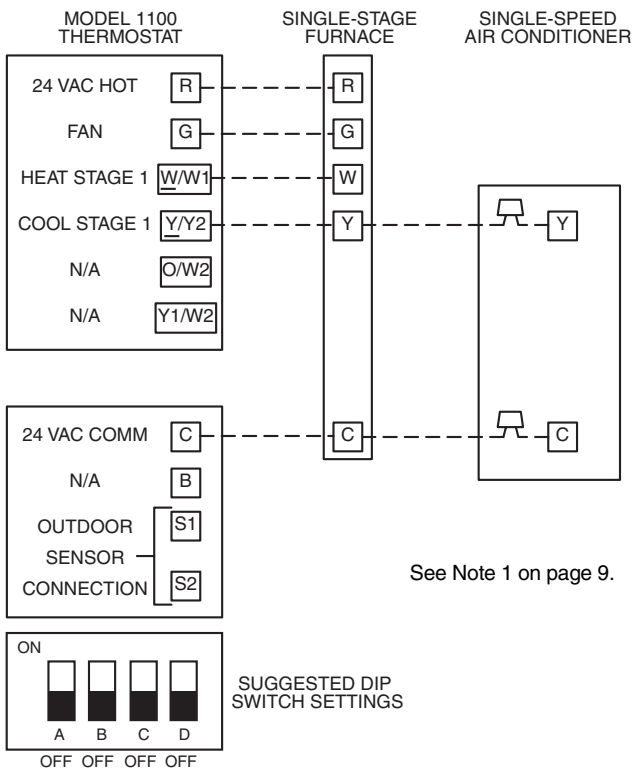


Fig. 2 — Single-Speed Air Conditioner with Single-Stage Furnace — Model 1100 Thermostat

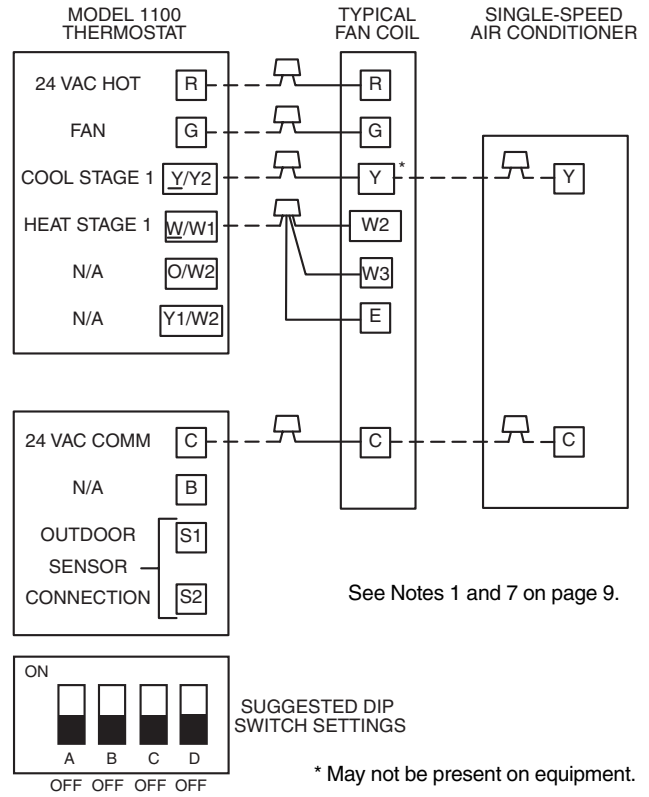


Fig. 4 — Single-Speed Air Conditioner with Typical Fan Coil — Model 1100 Thermostat (Single-Stage Heat Control)

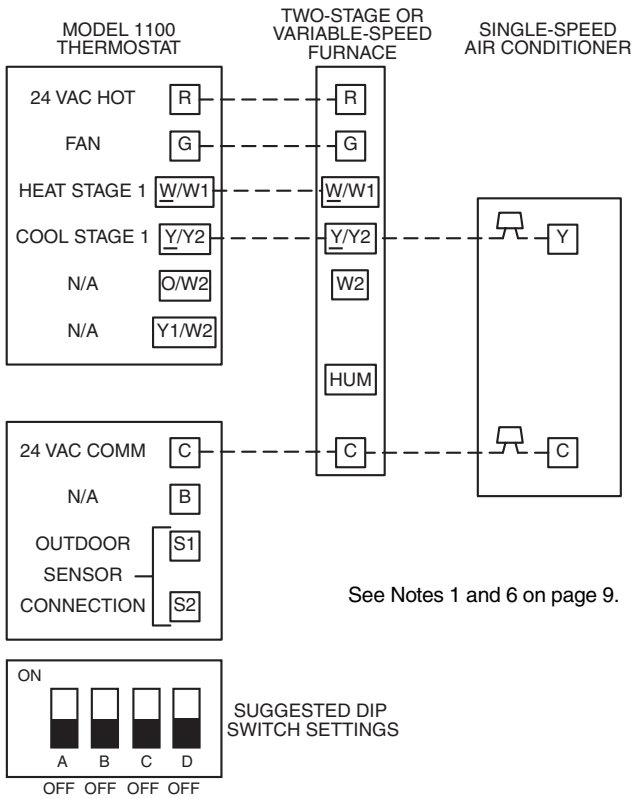


Fig. 3 — Single-Speed Air Conditioner with 2-Stage or Variable-Speed Furnace — Model 1100 Thermostat

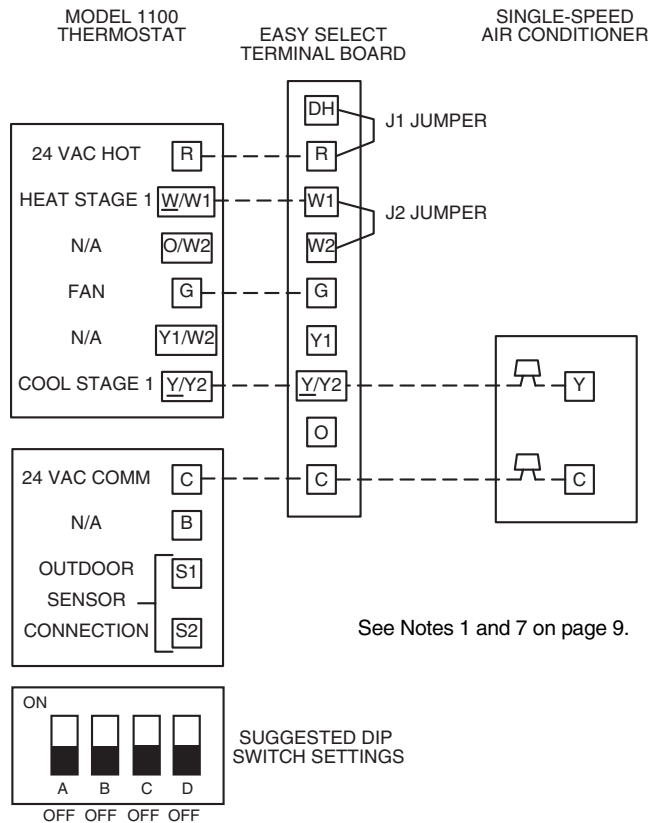


Fig. 5 — Single-Speed Air Conditioner with Variable-Speed Fan Coil — Model 1100 Thermostat

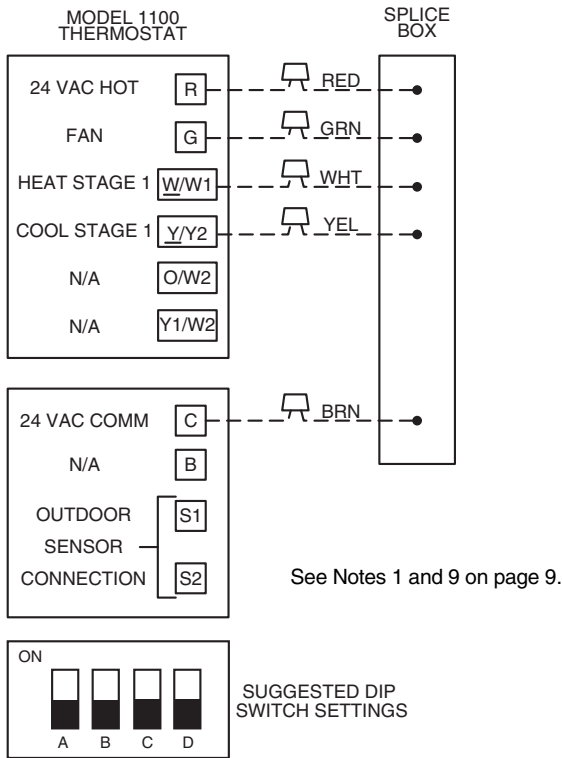


Fig. 6 — Single-Speed Packaged Air Conditioner with Single-Stage Gas Furnace — Model 1100 Thermostat

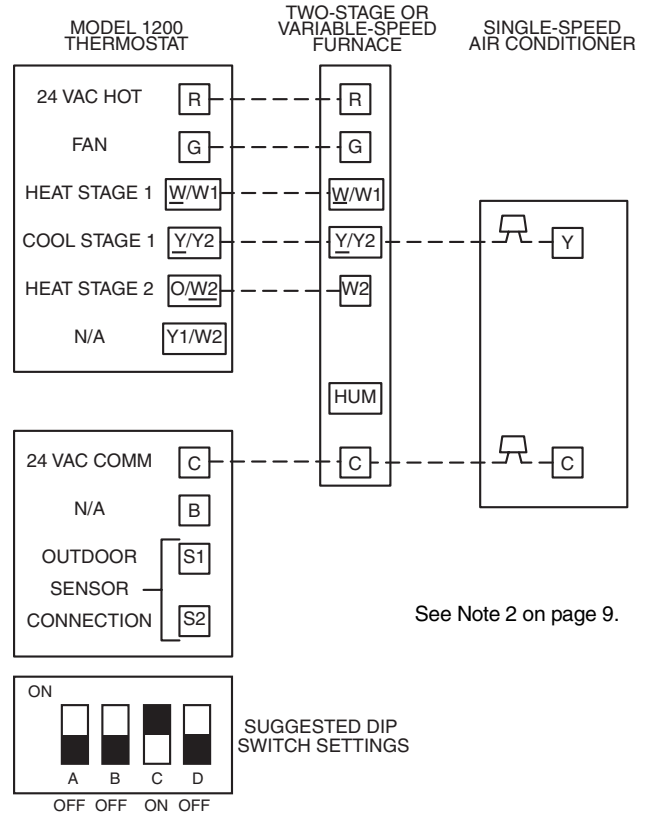


Fig. 8 — Single-Speed Air Conditioner with 2-Stage or Variable-Speed Furnace — Model 1200 Thermostat

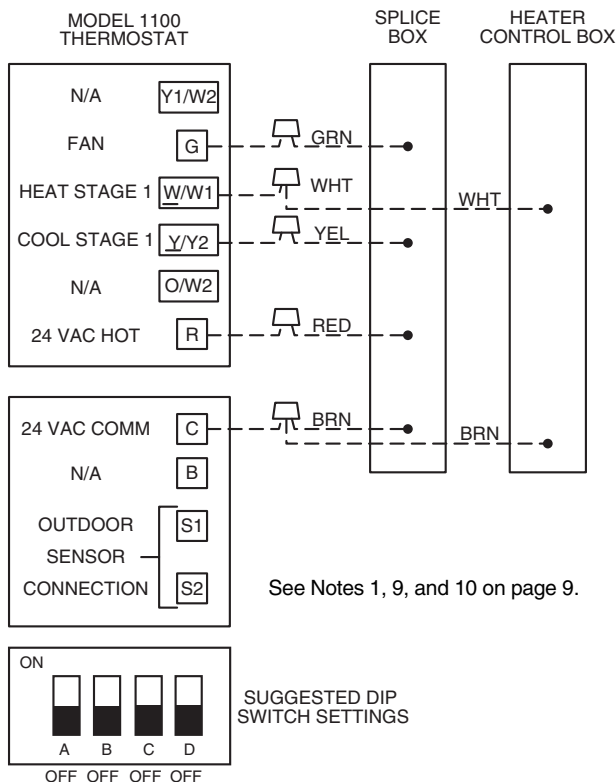


Fig. 7 — Single-Speed Packaged Air Conditioner with Single-Stage Electric Heat — Model 1100 Thermostat

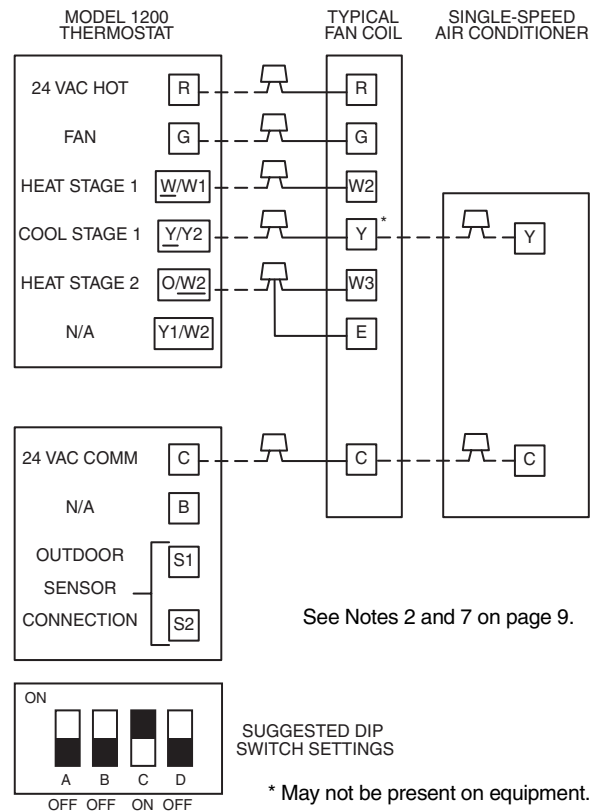


Fig. 9 — Single-Speed Air Conditioner with Typical Fan Coil — Model 1200 Thermostat (Dual-Stage Heat Control)

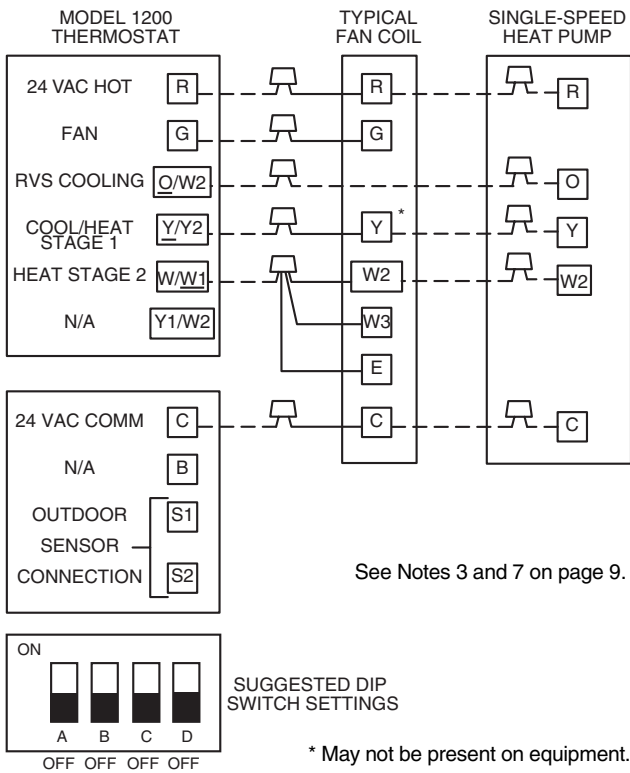


Fig. 10 — Single-Speed Heat Pump with Typical Fan Coil — Model 1200 Thermostat

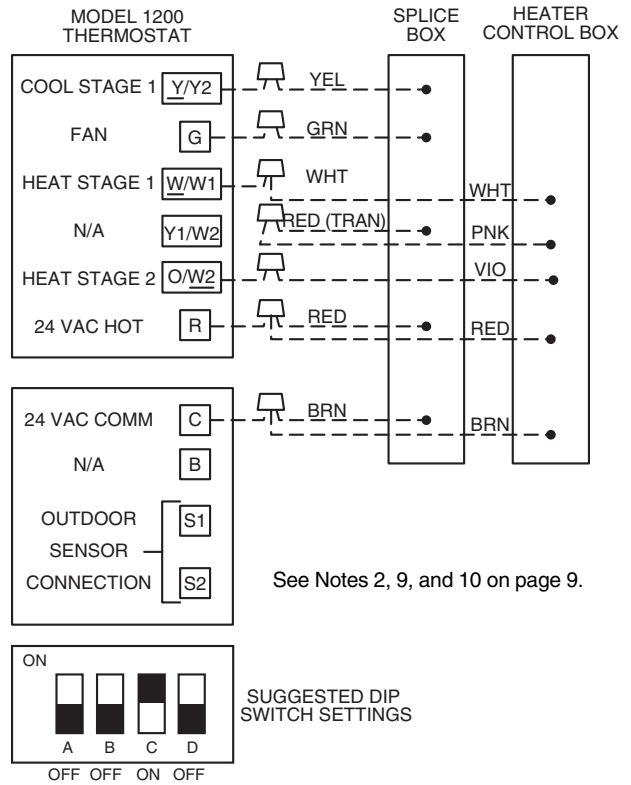


Fig. 12 — Single-Speed Packaged Air Conditioner with 2-Stage Electric Heat — Model 1200 Thermostat

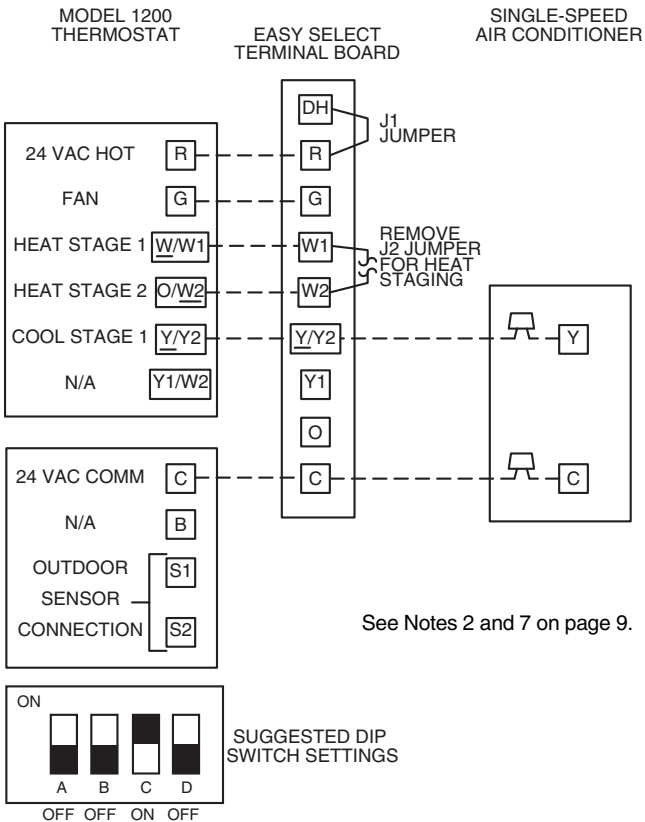


Fig. 11 — Single-Speed Air Conditioner with Variable-Speed Fan Coil — Model 1200 Thermostat

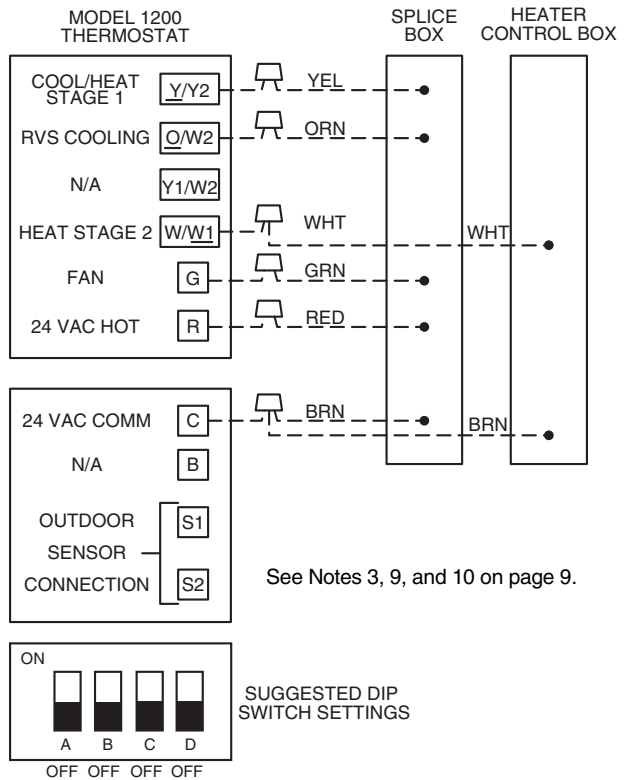


Fig. 13 — Single-Speed Packaged Heat Pump with Single-Stage Electric Heat — Model 1200 Thermostat

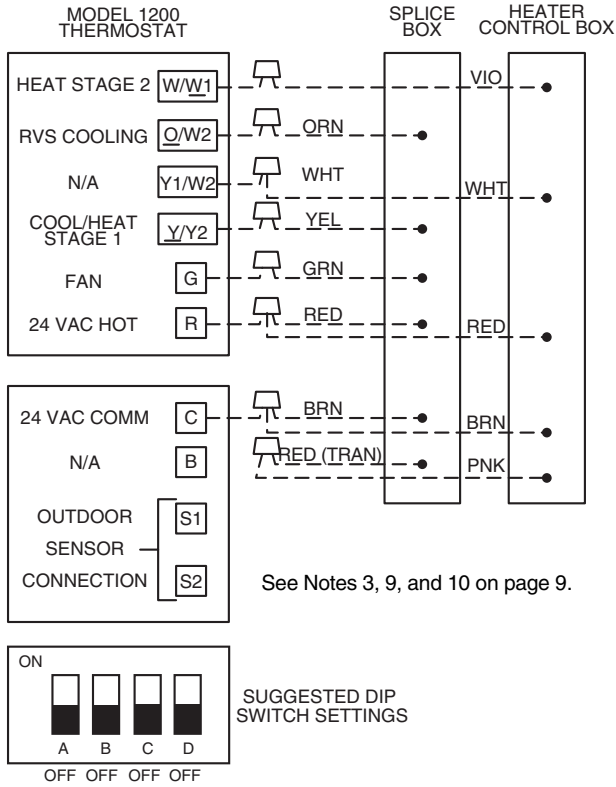


Fig. 14 — Single-Speed Packaged Heat Pump with 2-Stage Electric Heat — Model 1200 Thermostat

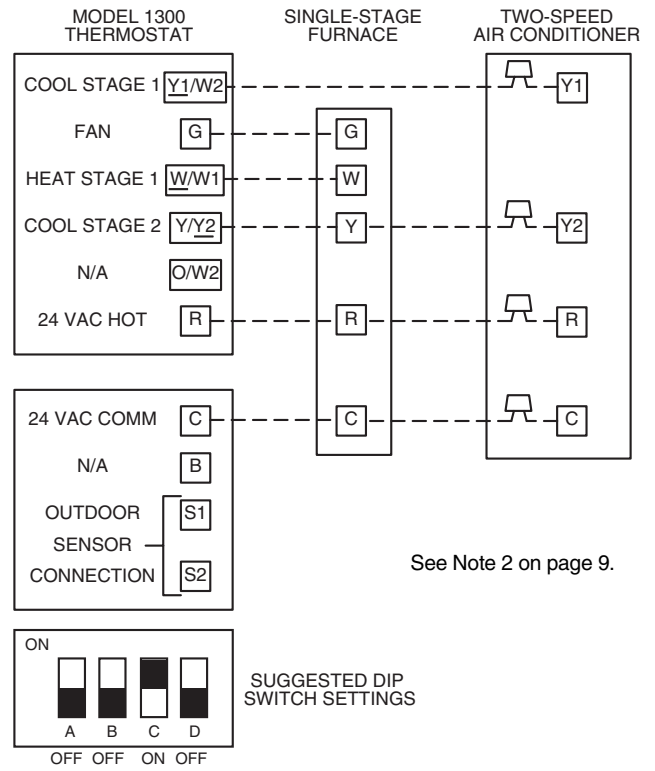


Fig. 16 — Two-Speed Air Conditioner with Single-Stage Furnace — Model 1300 Thermostat

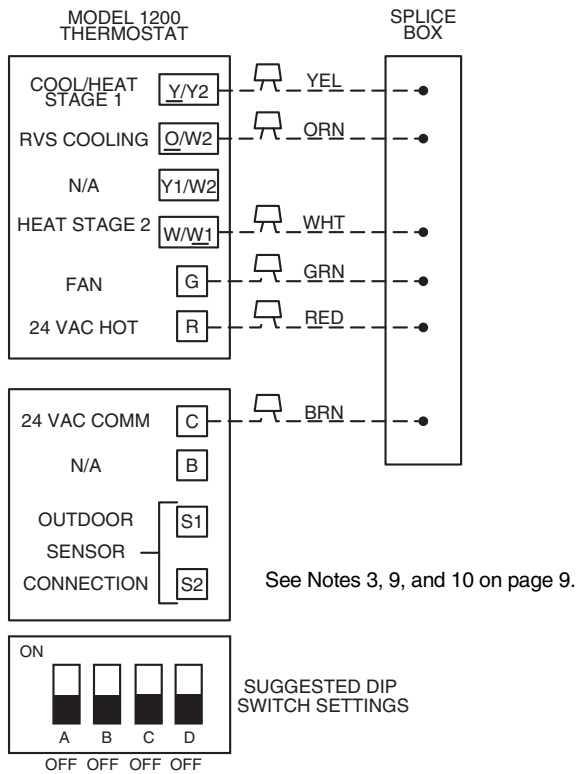


Fig. 15 — Single-Speed Packaged Heat Pump with Single-Stage Gas Furnace — Model 1200 Thermostat

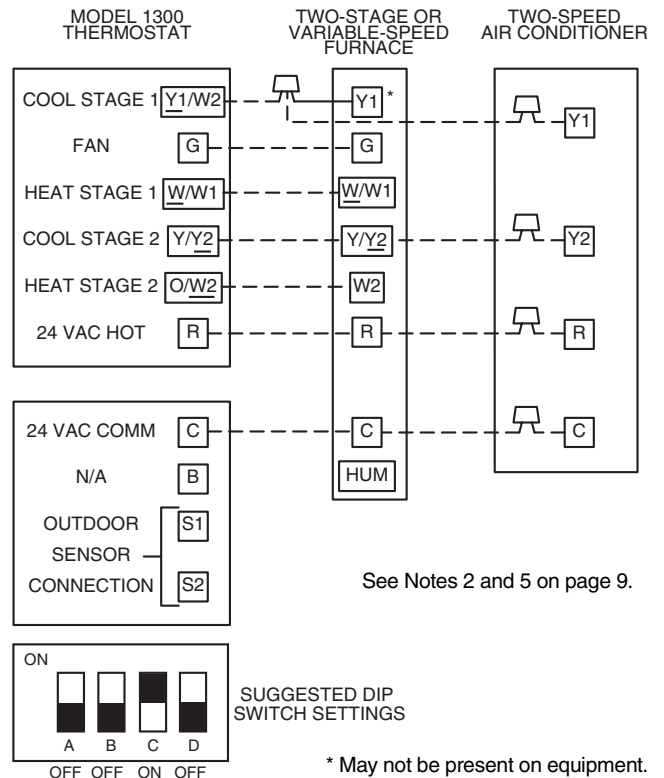


Fig. 17 — Two-Speed Air Conditioner with 2-Stage or Variable-Speed Furnace — Model 1300 Thermostat

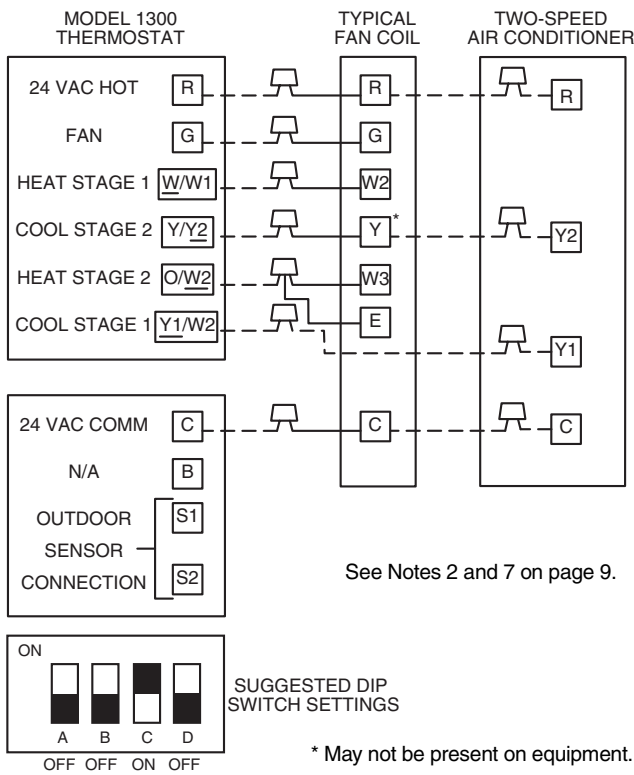


Fig. 18 — Two-Speed Air Conditioner with Typical Fan Coil — Model 1300 Thermostat

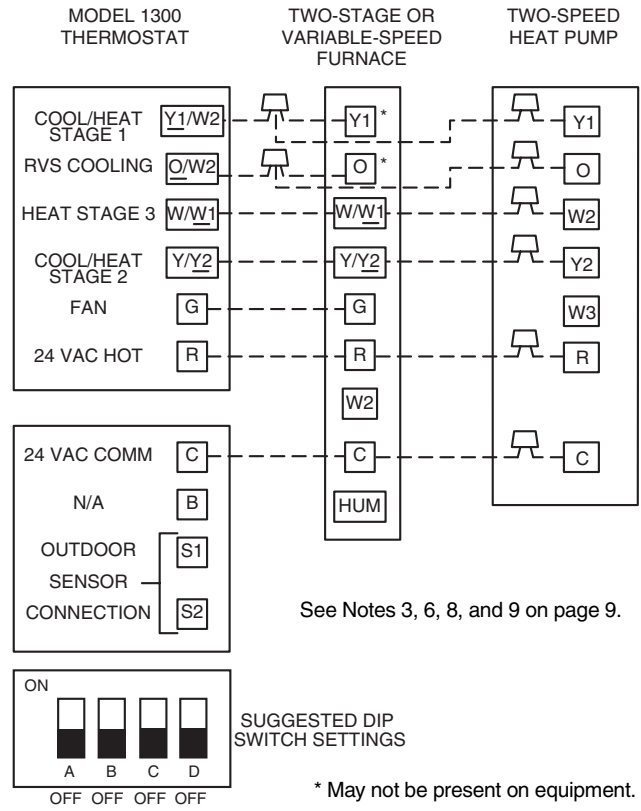


Fig. 20 — Two-Speed Heat Pump with 2-Stage or Variable-Speed Furnace — Model 1300 Thermostat

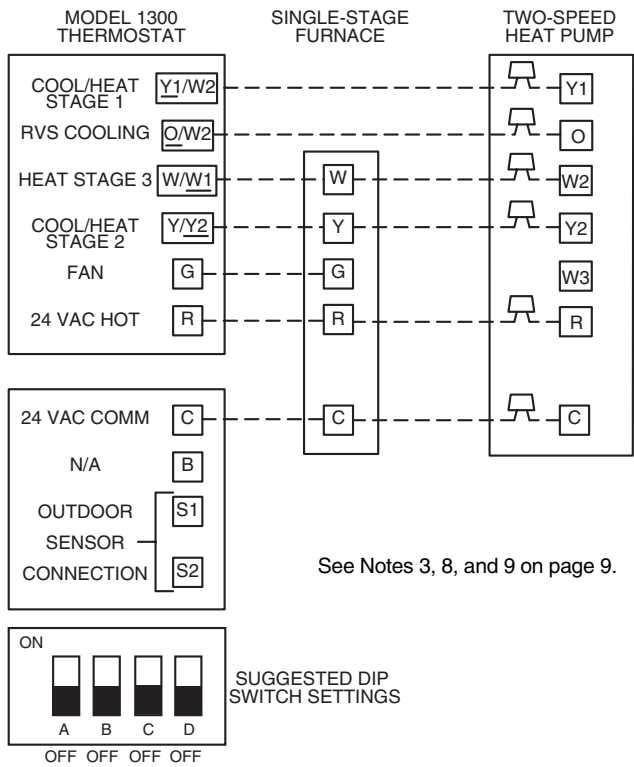


Fig. 19 — Two-Speed Heat Pump with Single-Stage Furnace — Model 1300 Thermostat

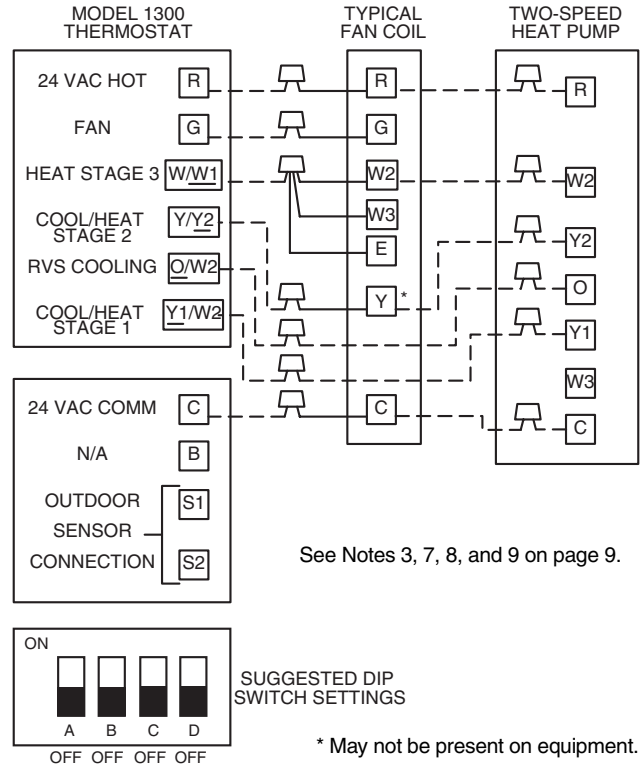


Fig. 21 — Two-Speed Heat Pump with Typical Fan Coil — Model 1300 Thermostat

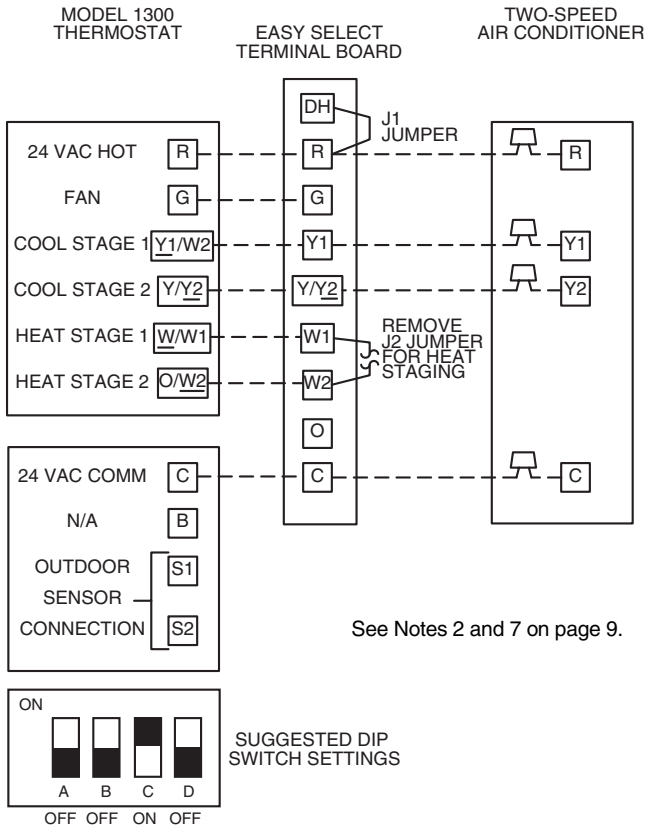


Fig. 22 — Two-Speed Air Conditioner with Variable-Speed Fan Coil — Model 1300 Thermostat

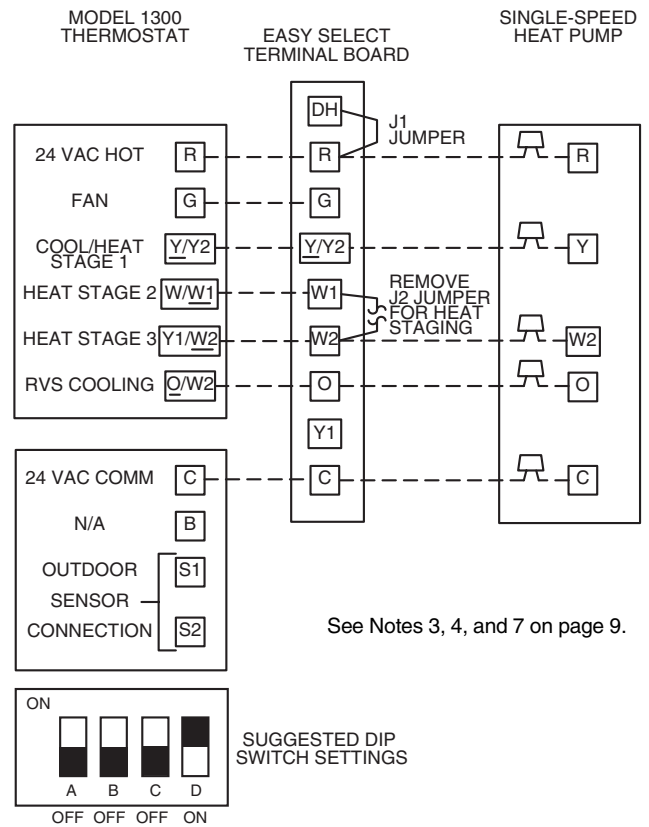
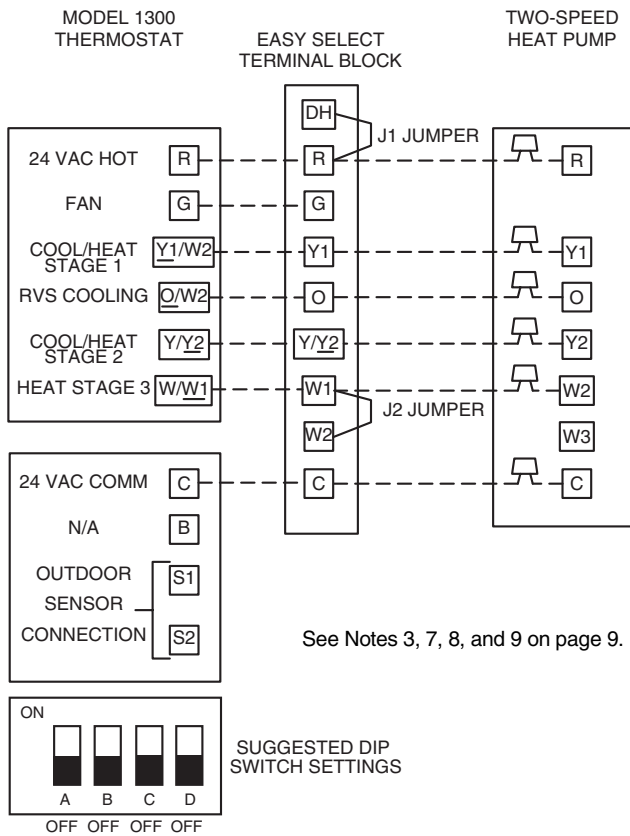


Fig. 23 — Two-Speed Heat Pump with Variable-Speed Fan Coil — Model 1300 Thermostat

Fig. 24 — Single-Speed Heat Pump with Variable-Speed Fan Coil and Special 3-Stage Electric Heat — Model 1300 Thermostat



NOTES FOR (FIG. 2-24)

1. The 1100 model thermostat can only control 1-stage cool and 1-stage heat. DIP Switch C has no controlling function and can either be ON or OFF.
2. The 1200 and 1300 model thermostats MUST have DIP Switch C ON when installed in air conditioner applications. If required, second-stage heat is controlled by O/W2. Refer to indoor equipment installation instructions for proper setup.
3. The 1200 and 1300 model thermostats MUST have DIP Switch C OFF when installed in heat pump applications. The reversing valve is controlled by O/W2.
4. Intelligent Heat Staging Option: 1300 model thermostats with DIP Switch C OFF and Switch D ON. This provides single-stage heat pump operation Y/Y2, with three-stage auxiliary heat via W/W1 and Y1/W2. Refer to variable-speed fan coil installation instructions. Proper 'intelligent heat capable' electric heater package must be used.
5. As an option, lock the furnace into low-fire operation and let O/W2 control high-fire operation. Refer to indoor equipment installation instructions for proper setup.
6. Furnace must control its own second-stage heat operation via furnace control algorithm. Refer to indoor equipment installation instructions for proper setup.
7. Refer to fan coil installation instructions for proper wiring.
8. Select the "ZONE" position on the 2-speed heat pump control board.
9. Refer to outdoor equipment installation instructions for proper setup.
10. Program thermostat to bring on fan (G) with any heat (W) selection. See Step 5 — Set Thermostat Configuration.

Step 4 — Space Temperature Averaging — Applications that require averaging using multiple remote space temperature sensors can be satisfied using either 4 or 9 sensors as shown in Fig. 25. 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 2.

NOTE: Only Totaline® sensors (P/N P274-0401) 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 homeowner. These options are not discussed in the corresponding 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 option number (smaller) will be displayed in the upper right corner on the thermostat display. The option number will be flashing and can be changed with the Up and Down Arrow buttons. Once the desired configuration option is displayed, press the Set Time/Temp button to configure the option. See Table 3. The option number will stop flashing and the configuration value (larger) on the left of the thermostat display will flash. Change the configuration value with the Up and Down Arrow buttons. Press the Set Time/Temp button again to save the configuration and change a different configuration. Record all chosen configuration options on page 16. Press the End button to exit Configuration mode. The thermostat will automatically exit Configuration mode if no button is pressed for 3 minutes.

NOTE: When setting the configuration on the thermostat, the configuration “on” is displayed as On, and the configuration “off” is displayed as OF.

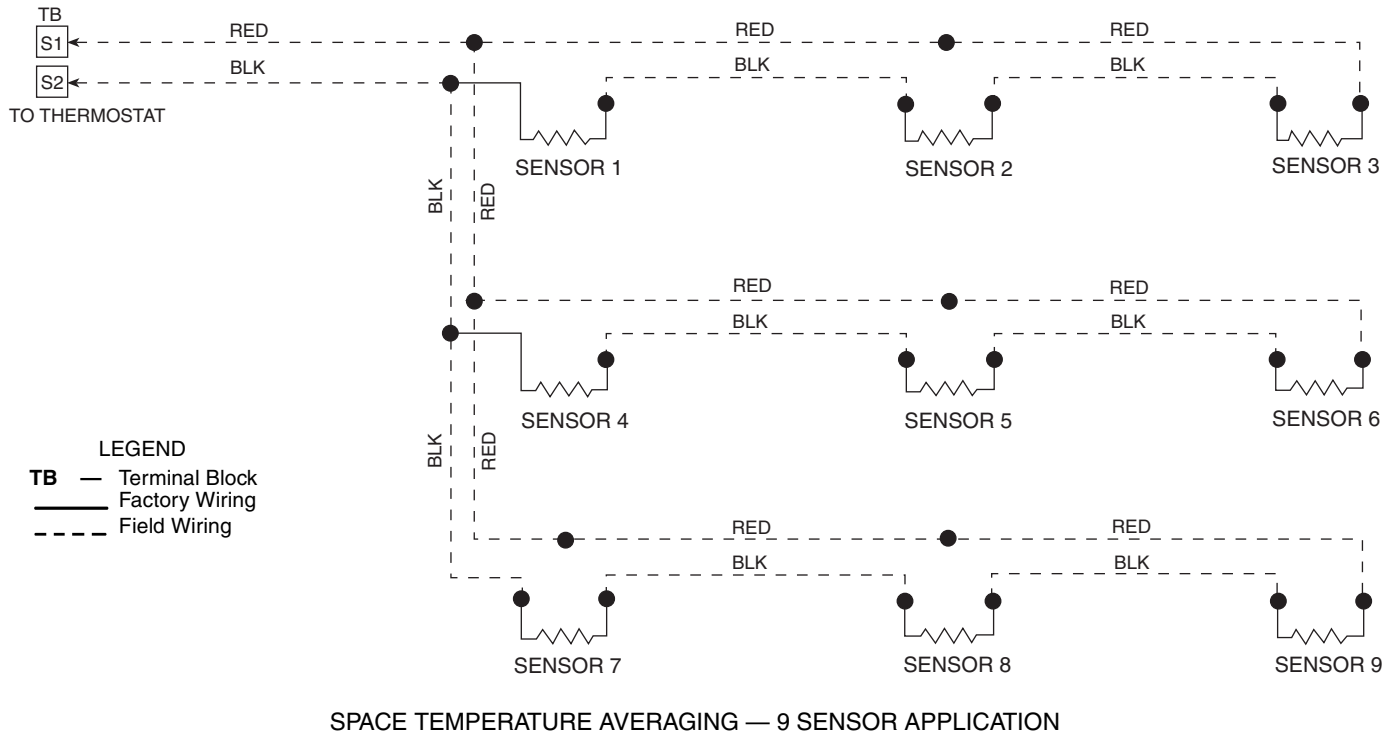
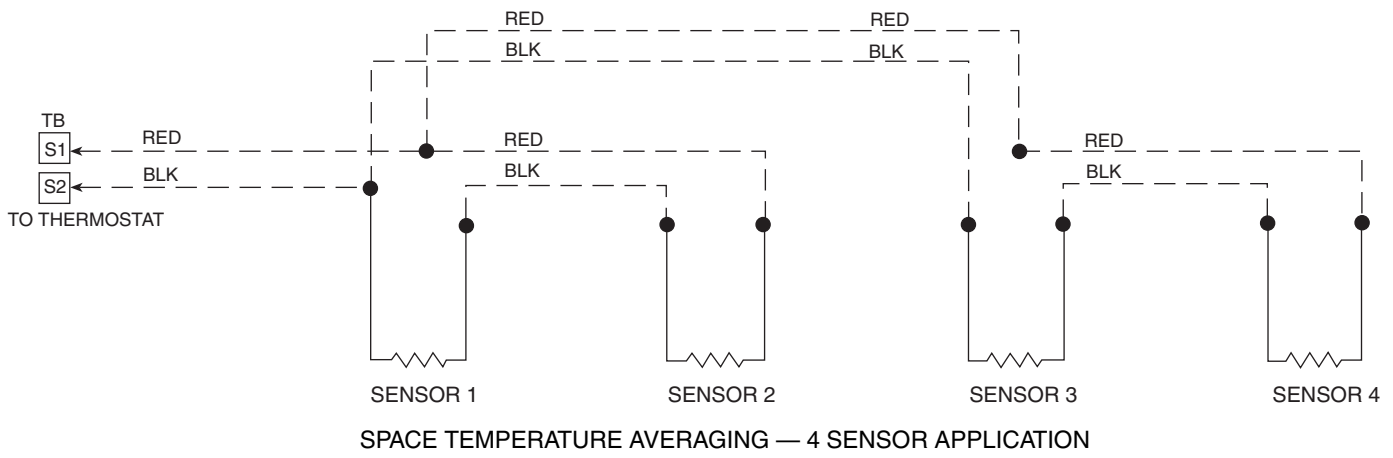
Table 2 — Temperature Sensor Resistance vs. Temperature Values

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 3 — Thermostat Configuration Options

OPTION NO.	DESCRIPTION	CONFIGURATION VALUE RANGE	DEFAULT
01	Anticipator adjustment	1 to 9	3
02	Clean filter timer adjustment	OF, 1 to 9	2
03	Fahrenheit or Celsius operation	F, C	F
04	Enable Fan (G) On with any heat (W)	OF, On	On (enabled)
05-07	N/A		
08	Auxiliary Heat Lockout Temperature	OF, 5 to 55 F	OF
09-12	N/A		
13	Room temperature offset adjustment	-5 to 5 F	0 F (no offset)
14	N/A		
15	Enable AUTO mode	OF, On	On (enabled)



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

Fig. 25 — Space Temperature Averaging

ANTICIPATOR ADJUSTMENT SELECTION (Option No. 01) — The anticipator adjustment selection 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). However, a limiting feature will not allow more than 4 cycles per hr, regardless of setting. 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.

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 (Option No. 02) — The clean filter selection determines how many hours of fan operation will pass before the CLEAN FILTER indicator 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). The default is 2 (800 hours).

FAHRENHEIT OR CELSIUS SELECTION (Option No. 03) — The thermostat can be set to use a Celsius or Fahrenheit temperature display. This option toggles between F (Fahrenheit) and C (Celsius). The default value is F.

ENABLE FAN (G) ON WITH ANY HEAT (W) (Option No. 04) — The thermostat can be set to turn the fan (G output) on or off when the heat input (terminal W) is energized. This option toggles between OF (fan off during heating) and On (fan on during heating). Most fan coils manage their own blowers and do not require a separate G signal. For these applications, select OF (off). Some auxiliary heaters require a separate G signal to turn on the blower. In this case, select On. The default value is OF. The W relay option only cycles the fan when the fan is in the Auto Mode and this option is configured to On.

AUXILIARY HEAT LOCKOUT TEMPERATURE ADJUSTMENT (Option No. 08) — This option is present in heat pumps and 2-speed models only when configured as heat pumps. An outdoor temperature sensor must be attached. This option allows selection of an outdoor temperature of 5 to 55 F in 5 degree steps (or equivalent values in C) or OF (off). Auxiliary heat is prevented from operating for outdoor temperatures above the selected temperature. If OF (off) is selected, auxiliary heat is allowed at all outdoor temperatures. If selected, Emergency Heat mode (E HEAT) overrides this feature. Factory default is OF.

ROOM TEMPERATURE OFFSET ADJUSTMENT (Option No. 13) — The room temperature offset adjustment is an offset which is added or subtracted from the local temperature sensor reading. The range of acceptable values is -5 to +5 degrees. The default is 0 degrees (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.

ENABLE AUTO MODE (Option No. 15) — The enable auto mode selection allows the installer to enable or disable AUTO mode (automatic changeover between heat and cool). When disabled, AUTO indicator does not appear when successive presses of the Mode button are used to move between OFF, HEAT, COOL, and E HEAT (in heat pump systems). Factory default is ON (AUTO enabled).

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. The FAN ON indicator and the G output will go on within a few seconds, causing the fan to operate. The fan should run continuously. Check fan operation. Pressing the Fan button again will turn off the G output and turn On the fan AUTO indicator.
3. Press the Mode button repeatedly until HEAT is displayed in the mode indicator. Press the Set Time/Temp button until the heat set point (lower right 2 digit display with HEAT now flashing under it) is flashing. Press the Up Arrow 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 HEAT is displayed in the mode indicator. Press the Set Time/Temp button until the heat set point (lower right 2 digit display with HEAT now flashing under it) is flashing. Press the Up Arrow button until the set point reads 2 or 3 degrees (not more) above room temperature. This will create a Heat Stage 1 demand. A small triangle to the left of this HEAT indicator will flash or come on continually. Flashing means the equipment is going to turn on but is presently being held off by a system timer. See base unit operational information for timer descriptions. Defeat timer by pressing the Up Arrow and Fan buttons together (increase temperature). This will make the triangle stay on and turn on Heat Stage 1. For actual outputs, refer to Table 4, making sure the correct row from the table is selected. To turn off, reduce heating set point below room temperature. The heating and the triangle will turn off within a few seconds.
If the system has multiple heat stages, it will start on Heat Stage 1 and proceed to Heat Stage 2 in 15 minutes due to a staging timer which requires 15 minutes between successive stages. The Up Arrow and Fan buttons together (increase temperature) cannot be used to defeat this timer. If set point is raised more than 5 degrees above room temperature, the staging timer is defeated and the thermostat will call for higher stages within 5 seconds. Use this method if there are only 2 stages of heat. If more than 2 stages of heat are available, do not use this method because once the demand exceeds 5 degrees, the thermostat may jump to the highest stage. With more than 2 stages available, let the timer advance one stage every 15 minutes.
5. Press the Mode button repeatedly until HEAT is displayed in the mode indicator. Press the Set Time/Temp button until the cool set point (upper right 2 digit display with COOL now flashing under it) is flashing. Press the Up Arrow button until the set point reads 2 or 3 degrees (not more) below room temperature. This will create a cooling demand. A small triangle to the left of this COOL indicator will flash or come on continually. Flashing means the equipment is going to turn on but is presently being held off by a system timer. See base unit operational information for timer descriptions. Defeat the timer by pressing the Up

Arrow and Fan buttons together (increase temperature). This will make the triangle stay on and turn Cool Stage 1 on. For actual outputs, refer to Table 4, making sure the correct row from the table is selected. To turn off, raise cooling set point above the room temperature. Cool Stage 1 and the triangle will turn off within a few seconds. If system has 2 cooling stages, it will start on Cool Stage 1 and proceed to Cool Stage 2 in 15 minutes due to a staging timer which requires 15 minutes between successive stages. The Up Arrow and Fan buttons together (increase temperature) cannot be used to defeat this timer. This timer can be defeated by reducing the set point to more than 5 degrees below room temperature, bringing on a Cool Stage 2 demand within 5 seconds. Remember: 2-stage cooling units often have a 1-minute off time between low and high, so the thermostat's demand will not show immediately as a change in the outdoor unit. It will show immediately as an increase in the indoor fan speed.

- To test, press the Mode button until E HEAT indicator turns on. This will allow operation of auxiliary heat only. Raising the set point above room temperature will turn on the first stage of auxiliary heating (W/W1). Raising the set point more than 5 degrees above room temperature will advance to full heat, if it is available (O/W2 or Y1/W2 will come on—see Table 4). Reducing set point below room temperature will turn all heat off.

Step 7 — Select Thermostat Operation Settings

Thermostat operation should already be configured. Set the Fan and Mode configurations to their desired settings. Press the Up and Down Arrow 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 indicator above the time display. Press the Up and Down Arrow buttons until the correct time is shown. Hold down the buttons to move quickly through the time display. The AM and PM indicators 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 of the week shown on the thermostat display to the next day. If a schedule has been entered, the thermostat will follow the schedule of the newly selected day of the week.

Step 10 — Programming Thermostat Schedules — Before programming the thermostat, plan the thermostat daily schedule. The schedule is divided into 4 time periods (WAKE, DAY, EVE, SLEEP). Each time period has a start time, heating set point, and cooling set point. Fill in the schedule table on page 16 as an aid to programming the daily schedules.

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

- Enter Programming mode by pressing the Program button. The PROGRAMMING indicator will appear on the thermostat display. The current day of the

schedule will be displayed above the clock and the current programming time period of that day will be displayed. The TIME indicator will flash.

NOTE: If a programming button is not pushed for 2 minutes, the thermostat will exit Programming mode and any changes made will be saved.

- Press the Up and Down Arrow buttons to set the desired start time for the schedule day and period shown. Time selection is in 15-minute increments.
- Press the Set Time/Temp button once the correct time is shown. The TIME indicator will stop flashing and the HEAT indicator will flash.

- Using the daily comfort schedule as a guide, program the heating and cooling settings. The HEAT and COOL indicators will flash for the heating and cooling settings respectively. The Set Time/Temp button is used to toggle between the time, heating, and cooling settings. Use the Up and Down Arrow buttons to raise and lower the temperature set points.

NOTE: There must be at least 2 degrees difference between the cooling and heating settings. The thermostat will automatically change any settings closer than 2 degrees.

- Press the Program button to advance to the next time period.
- Perform Steps 2 through 5 until the times and temperature settings have been entered for the entire day. Press the Change Day button to move to the schedule for the next day.
- 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.
- After all the times and settings 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 PROGRAMMED SCHEDULE — The schedule can be overridden in 2 ways: the Hold button can be pressed to lock in the current temperature setting or the Up and Down Arrow buttons can be pressed to change the desired temperature. The thermostat will use the new set points until the next scheduled time period starts. Once the Hold button is pressed, any adjustments made will last indefinitely until the Hold button is pressed again.

Step 11 — Final Checklist

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

Table 4 — Thermostat Output Assignments

MODEL P274-	OUTDOOR UNIT	AC/HP SWITCH C	STAGING SWITCH D	THERMOSTAT OUTPUT									
				24V HOT	COMMON	FAN	HEAT STAGE 1	HEAT STAGE 2	HEAT STAGE 3	HEAT STAGE 4	COOL STAGE 1	COOL STAGE 2	REVERSE VALVE
1100	AC	EITHER	EITHER	R	C	G	W/W1	N/A	N/A	N/A	Y/Y2	N/A	N/A
1200	HP	OFF	EITHER				Y/Y2	W/W1	N/A	N/A	Y/Y2	N/A	O/W2
	AC	ON	EITHER				W/W1	O/W2	N/A	N/A	Y/Y2	N/A	N/A
1300	2S AC	ON	EITHER				W/W1	O/W2	N/A	N/A	Y1/W2	Y/Y2	N/A
	2S HP	OFF	OFF				Y1/W2	Y/Y2	W/W1	N/A	Y1/W2	Y/Y2	O/W2
	1S HP*	OFF	ON				Y/Y2	W/W1	Y1/ W2†	W/W1, Y1/W2	Y/Y2	N/A	O/W2

LEGEND

- 1S — 1-Speed
- 2S — 2-Speed
- AC — Air Conditioner
- C — Terminal C
- G — Terminal G
- HP — Heat Pump
- N/A — Not Available
- R — Terminal R

* Intelligent heat option.
† Y1/W2 is on without W/W1.

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 indicator 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.

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 E HEAT selection. If E HEAT is selected and there is a heating demand, the thermostat will turn on the O/W2 output when the AC/HP DIP Switch C is set to the AC position or O/W2 output when the AC/HP DIP Switch C is set to the HP position. The indicator for each selection will be displayed on the thermostat when selected.

Outdoor Temperature — When the Up and Down Arrow 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.” The display then returns to normal. If a sensor is not connected or the reading is out of range, then “--” is displayed. The valid temperature range for the outdoor-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 Timeguard — This 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 and Up Arrow buttons together (increase temperature).

Fifteen-Minute Cycle Timer — This timer prevents the start of a heating or cooling cycle until at least 15 minutes after the last start of the same cycle. Its function is to assure that equipment is not cycled more than 4 times per hour. This timer is defeated for 1 cycle when the desired temperature is manually changed. It can also be defeated for 1 cycle by simultaneously pressing the Fan and Up Arrow buttons together (increase temperature).

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 Points — 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 — The thermostat will not change from heating to cooling or cooling to heating until an opposite demand has existed for a minimum of 20 minutes. The timer is disabled if the heating or cooling set point is changed.

Power-On Check — When power is applied to the thermostat, all possible display indicators 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:

- AC — 1-speed air conditioner
- HP — 1-speed heat pump
- A2 — 2-speed air conditioner
- H2 — 2-speed heat pump
- HS — Intelligent heat staging with a variable-speed fan coil and 1-speed heat pump

Error Codes — If an error is present, the thermostat will display an error code. See Table 5.

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.

TROUBLESHOOTING

For Troubleshooting and Error Code information, refer to Table 5.

Table 5 — Error Codes and Troubleshooting

PROBLEM	SOLUTION
“--” on temperature display	Temperature sensor reading out of range. Check sensor for damage. If recessing power does not clear display, thermostat should be replaced.
“E2” on temperature display	Brownout condition or too low of voltage to thermostat. Double check wiring and check for 24 vac between R and C. E2 will clear 15 seconds after proper voltage is restored.
“E3” on temperature display	Outdoor temperature reading out of range and needed for Option No. 8. Check outdoor temperature sensor and its wiring.
“Clean Filter” on temperature display	After the selected number of hours of blower operation, the CLEAN FILTER indicator will display. This is to remind the homeowner to check the filter. Press the Reset Filter button to clear display and reset timer to 0.
Cooling will not come on	Select COOL mode. Decrease the cooling setpoint to 10 degrees below room temperature. Simultaneously press the Up Arrow and Fan buttons together (increase temperature). Check for 24 vac at Y/Y2 terminal. If present, the thermostat is OK and the problem is with equipment or wiring. If not present, replace the thermostat.
Heating will not come on	Select HEAT mode. Increase the heating setpoint to 10 degrees above room temperature. Simultaneously press the Up Arrow and Fan buttons together (increase temperature). Check for 24 vac at Y/Y2 (with HP) or W/W1 (with AC) terminal. If present, the thermostat is OK and the problem is with equipment or wiring. If not present, replace the thermostat.

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

PROGRAMMABLE THERMOSTAT CONFIGURATION RECORD

Date _____

Owner/Operator _____ Thermostat Model No. _____

A) Hardware Configuration

- Switch A _____ Zoning Selection (OFF = disable, ON = enable)
- Switch B _____ Smart Recovery (OFF = enable, ON = disable)
- Switch C _____ Heat Pump Operation (OFF = enable, ON = disable)
- Switch D _____ Intelligent Heat Staging (OFF = disable, ON = enable)

B) Configuration Options

- 01 _____ Anticipator Adjustment (1-9: factory default = 3)
- 02 _____ Clean Filter Timer Adjustment (OF or 1-9: factory default = 2)
- 03 _____ Fahrenheit or Celsius Operation (F or C: factory default = F)
- 04 _____ Enable Fan (G) On with Any Heat (W) (OF or On: factory default = OF)
- 05-07 _____ N/A
- 08 _____ Auxiliary Heat Lockout Temperature (OF or 5-55 F: factory default = OF)
- 09-12 _____ N/A
- 13 _____ Room Temperature Offset Adjustment (-5 to +5 degrees): factory default = 0)
- 14 _____ N/A
- 15 _____ Enable AUTO Mode (OF or On: factory default = On)

C) Schedule

	WAKE			DAY			EVE			SLEEP		
	TIME	HEAT	COOL	TIME	HEAT	COOL	TIME	HEAT	COOL	TIME	HEAT	COOL
Mon												
Tue												
Wed												
Thu												
Fri												
Sat												
Sun												