

Installation and Operating Instructions

NOTE: Read the entire instruction manual before starting the installation.

SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause fire, electrical shock, or other conditions which may cause personal injury or property damage. Consult a qualified installer, for information or assistance. The qualified installer must use factory-authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes and wear safety glasses. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local and state building codes and Sheet Metal and Air Conditioning National Association (SMACNA) for special installation requirements.

Recognize safety information. This is the safety-alert symbol . When you see this symbol on the unit or in instructions and manuals, 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 hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **would** result in minor personal injury or product and property damage.

INTRODUCTION

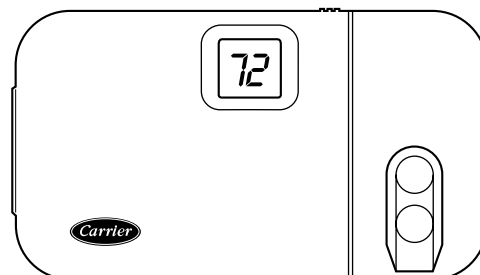
Carrier residential thermostats are wall-mounted, low-voltage thermostats which maintain room temperature by controlling the operation of an HVAC (heating, ventilation and air conditioning) system. Separate heating and cooling set points and auto-changeover capability provides maximum comfort and flexibility. Some applications may require the addition of a jumper from RC to RH (see wiring diagrams). The thermostat comes factory configured for air conditioner operation. See Fig. 1 for thermostat dimensions. During power interruption the internal memory stores settings indefinitely. Batteries are not required. The thermostat requires 24 vac (both Rc and C terminals) to be connected for proper operation. The thermostat will not operate without the required connections. (See Table 1). This AC Model (1-stage cool, 1-stage heat) thermostat is to be used for single-stage heating and/or cooling applications. This thermostat has separate heat and cool circuits. Some applications require the addition of a jumper from RC to RH. See applicable wiring diagram for more information. This thermostat can be used with optional outdoor temperature sensor.

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



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HEIGHT (IN.)	WIDTH (IN.)	DEPTH (IN.)
3-7/8	5-3/4	1-7/16

Fig. 1—Non Programmable Thermostat

→ Table 1—Wiring Diagram Chart

INDOOR UNIT	OUTDOOR UNIT	THERMOSTAT WIRING DIAGRAM
1-Stage Furnace	1-Spd AC	See Fig. 2
2-Stage Furnace	1-Spd. AC	See Fig. 3
Typical Fan Coil	1-Spd. AC	See Fig. 4
Variable-Speed Fan Coil	1-Spd. AC	See Fig. 5
Boiler / Fan Coil	1-Spd. AC	See Fig. 6
Typical Single-Speed Packaged AC Unit		See Fig. 7
Typical Single-Speed Packaged AC Unit w/Elect. Heat		See Fig. 8

- 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—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.

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

3. Open thermostat rear door (mounting base) to expose mounting holes.
4. Route thermostat wires through large hole in mounting base.
5. Level mounting base against wall and mark wall through the 2 mounting holes in base. This is for aesthetic value only thermostat need not be leveled for proper operation.

⚠ CAUTION

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

6. Drill two 3/16-in. mounting holes in wall where marked.
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 insulation from each wire at the end no more than 1/4-in. to prevent adjacent wires from shorting together.

⚠ CAUTION

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

9. Match and connect wires to terminals on the thermostat. Both Rc and C terminals must be connected. See Table 1 and Fig. 2-8 for additional wiring information.
10. Push any excess wiring into wall. Seal hole in wall to prevent drafts which may affect operation.
11. Close thermostat door.
12. Turn on power to unit. The thermostat will receive power from the unit. The thermostat will be powered by 24 vac, nominal (18 to 30 vac) through terminal Rc (+ 24 vac) and terminal C (common). Power consumption is 5 va at 24 vac.
13. When AC power is first applied, all segments of the display are turned on for a few seconds and the temperature display indicates the two-digit code: "AC" for single-speed air conditioner

Step 3—Set Thermostat Configuration

Configuration options are intended to be selected at installation and are not normally modified by the user. These options are not available in the owner's manual and must be done as part of the installation.

To enter Configuration mode, press and hold the FAN button for approximately 10 sec until the room temperature disappears and display reads "01". The thermostat is now in Configuration mode. If a button is not pressed for 3 minutes, the thermostat will automatically exit this mode.

The display is used to show both the option number and the selection choice within that option.

CONFIGURATION OPTIONS — Several different configurations can be set while in Configuration mode.

Anticipator Adjustment

This adjustment controls sensitivity and cycle rate of thermostat. Higher numbers decrease sensitivity and slow cycle rate. Lower numbers increase sensitivity and cycle rate. However, a limiting

feature will not allow more than 4 cycles per hour, regardless of setting. Anticipator values can range from 01 to 09. Factory default is 03. This default setting will provide optimum performance in nearly all installations.

Unlike conventional anticipators, this setting is not determined by current draw. There is no need to measure, know, or compensate for current draw. There is also no droop with this thermostat. Regardless of setting and number of stages, both heating and cooling will control to their respective set points.

1. Enter Configuration mode if not already there. See above. The upper small display will indicate 01. If 01 is not displayed, use UP and DOWN arrows to move to 01.
2. Press MODE button once to display the Set icon.
3. Use UP or DOWN arrows to move between available choices of 01 through 09. Factory default is 03.
4. Press MODE button again and Set will appear. Use the UP or DOWN arrows to select another option or press FAN to exit Configuration mode.

Clean Filter Timer

Select hours of blower operation (heating, cooling, or fan) before CLEAN FILTER icon is displayed. With OF (off) selected, icon will never come on, disabling this feature. Time selection can range from 400 to 3600 hr by selecting numbers 01 through 09. (Time is 400 X number selected.) Factory default is 02 (800 hr). Recommended selections are: disposable filter — 400 to 800 hr, media filter — 1200 to 1600 hr, or electronic air cleaner — 1600 to 2400 hr of blower operation.

1. Enter Configuration mode if not already there. Use up or down arrow until display reads 02.
2. Press MODE button once to display the Set icon.
3. Use UP or DOWN arrow to move between available choices of 01 through 09. Factory default is 02.
4. Press MODE button again and Set will appear. Use the UP or DOWN arrow to select another option or press FAN to exit Configuration mode.

Fahrenheit or Celsius Operation

Select between Fahrenheit (F) and Celsius (C) operation. Factory default is Fahrenheit.

1. Enter Configuration mode if not already there. (See Step 3—Set Thermostat Configuration.). Use UP and DOWN arrows until display reads 03.
2. Press MODE button once to display the Set icon.
3. Use UP or DOWN arrow to toggle between F and C on large display. Factory default is F.
4. Press MODE button again and Set will appear. Use the UP or DOWN arrow to select another option or press FAN to exit Configuration mode.

Enable Fan On With Any Heat

This selection determines whether terminal G (fan) output is to be On or Off when W (furnace or strip heat) output is On. Most furnaces and fan coils manage their own blowers and do not require a separate signal to G terminal. For these applications, select OF (off). Some auxiliary heaters require a separate signal to G to turn on the blower. In this case, select ON. Factory default is OF (off).

1. Enter Configuration mode if not already there. Use UP or DOWN arrow until display reads 04.
2. Press MODE button once. The Set icon will appear.
3. Use UP and DOWN arrows to toggle between OF and ON on large display. Factory default is OF.

4. Press MODE button again and Set will appear. Use the UP or DOWN arrow to select another option or press FAN to exit Configuration mode.

Zoning ON/OFF Selection

This option enables or disables the 15-minute cycle timer, 15-minute staging timer and the 5-minute compressor time guard. See Operation section of this manual for more detail. In zoning applications, the zone control center performs timing functions.

⚠ CAUTION

These timers must be enabled for normal operation (zoning OFF) and disabled (zoning ON) for zoning applications.

1. Enter Configuration mode if not already there. Use UP or DOWN arrow until display reads 07.
2. Press MODE button once. The Set icon will appear.
3. Use UP and DOWN arrows to toggle between OF and ON on the display. Factory default is OF (off).
4. Press MODE button again and Set will appear. Use the UP or DOWN arrow to select another option or press FAN to exit Configuration mode.

Room Temperature Offset

This option allows calibration (or deliberate miscalibration) of room temperature sensor. There are various reasons why homeowners may want to have displayed temperature adjusted to a higher or lower value. The selected number is number of degrees, plus or minus, which will be added to actual temperature. The numbers can range between -5 and +5. Factory default is 0. This adjusted value will be used as actual temperature for both display and control action. For example, if 2 is selected, 72 F actual will read 74 F. If set point is 72 F, the room will control to an actual temperature of 70 F which will be displayed and acted upon as if it were 72 F. This thermostat is factory calibrated within an accuracy of plus or minus 1° F. This adjustment will provide the best accuracy when set to 0.

1. Enter Configuration mode if not already there. Use UP or DOWN arrow until display reads 13.
2. Press MODE button once. The Set icon will appear.
3. Use UP and DOWN arrows to move between choices ranging from -5 to 5 in 1° increments on the display. Factory default is 0.
4. Press MODE button again and Set will appear. Use the UP or DOWN arrow to select another option or press FAN to exit Configuration mode.

Enable Auto Mode

This option allows the installer to enable or disable AUTO mode (automatic changeover between heat and cool). When disabled, AUTO icon does not appear. Factory default is ON (AUTO enabled).

1. Enter Configuration mode if not already there. Use UP or DOWN arrow until display reads 15.
2. Press MODE button once. The Set icon will appear.
3. Use UP and DOWN arrows to move between choices of ON or OF. Factory default is ON.
4. Press MODE button again and Set will appear. Use the DOWN arrow to select another option or press FAN to exit Configuration mode.

Step 4—Check Thermostat Operation

FAN OPERATION

1. Press FAN button. The fan ON icon will be displayed, causing fan to turn on.

2. Press FAN button again to turn off fan. The FAN icon will also turn off.

NOTE: Some fan coils have a 90 sec delay before the fan turns off.

COOLING OPERATION

1. Press MODE button until COOL icon is displayed.
2. Press and release the DOWN arrow until cooling set point is 5° below room temperature. The cool ON icon will be displayed and may flash. Flashing means the equipment is going to turn on but is presently being held off by a system timer. To override the timer, press UP arrow and FAN button at the same time.
3. To exit Cooling mode, increase cooling set point above room temperature.

HEATING OPERATION

1. Press and release the MODE button until HEAT icon is displayed.
2. Press and release the UP button until HEAT set point is 5° above room temperature. The heat ON icon will be displayed and may flash. Flashing means the equipment is going to turn on but is presently being held off by a system timer. To override the timer, press UP arrow and FAN button at the same time.
3. To exit Heating mode, reduce heating set point below room temperature.

OUTDOOR TEMPERATURE

If system is equipped with an outdoor temperature sensor, check the operation by pressing the UP and DOWN arrows at the same time. The outdoor temperature will be displayed for approximately 5 sec. If the "--" icon is displayed, the outdoor sensor is either not installed properly or is not present on the system. See Table 2 for Troubleshooting.

Step 5—Final Checklist

1. Run system through several heating and cooling cycles to ensure proper operation.
2. Properly set heating and cooling set points for operation.
3. Put away tools and instruments, and clean up debris.
4. Review Owner's Manual with owner.
5. Leave literature packet with owner.

OPERATION

Five-Minute Compressor Time Guard — This timer prevents the compressor from starting unless it has been off for at least 5 minutes. It can be defeated for one cycle by simultaneously pressing the FAN mode button and the UP arrow.

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 one cycle when the desired temperature is manually changed. It can also be defeated for one cycle by simultaneously pressing the FAN mode button and the UP button.

Three-Minute Minimum On Time — In normal operation when a stage is operating it will stay on for three minutes before turning off.

Heat/Cool Set Points (Desired Temperatures) — A minimum difference of 2° is enforced between heating and cooling set points. This is done by allowing one setting to "push" the other, to maintain this difference.

Table 2—Thermostat Troubleshooting

SYMPTOM	WHAT TO CHECK
Blank LCD	Check for 24 vac between Rc and C at terminal connections. Both R and C must be connected for proper operation.
“--” (2 dashes) On Temperature Display	Temperature sensor (inside thermostat) reading out of range. Check sensor for damage. The outdoor temperature sensor (if installed) is open, not connected, or shorted (both buttons pushed simultaneously). If recycling power does not clear display, thermostat should be replaced.
“E2” On Temperature Display	Brownout condition or voltage too low to thermostat. Double check wiring and check for 24 vac between Rc and C. E2 will clear 15 sec after proper voltage is restored.
“FILTER” On Temperature Display	After the selected number of hours of blower operation “FILTER” will display on LCD. This is to remind the homeowner to “check” the filter. Press RESET FILTER button to clear display and reset timer to 0.
Cooling Will Not Come On	Select COOL mode. Set desired temperature to 10° F below room temperature. Simultaneously press FAN and UP arrow buttons to defeat timers. Check for COOL ON icon and 24 vac at Y (first-stage) terminal. If present, thermostat is OK and problem is with equipment or wiring. If not present, replace thermostat.
Heating Will Not Come On	Select HEAT mode. Set desired temperature to 10° F above room temperature. Simultaneously press FAN and UP arrow buttons to defeat timers. Check for HEAT ON and 24 vac at W. If present, thermostat is OK and problem is with equipment or wiring. If not present, replace thermostat.

Auto Changeover — When the auto changeover mode is selected, a change from heat to cool (or vice versa) will not occur until an opposite mode demand has existed for 20 minutes. If the set point is changed, the 20 minute requirement is ignored.

Power On Check — When AC power is first applied, all segments of the display are turned on for a few seconds, and the temperature display indicates the 2-digit code: “AC” for single-speed air conditioner.

Outdoor Temperature —When an outdoor temperature sensor is attached, outdoor temperature can be read by pressing temperature UP and DOWN buttons at the same time.

→ **WIRING DIAGRAM NOTES:**

1. Field installed jumper **must** be installed between Rc and Rh terminals for proper operation. Rc = transformer 24VAC hot, and C = 24VAC common.
2. Furnace must control its own second stage heat operation via

furnace control algorithm. Refer to indoor equipment installation instructions for proper set up and wiring information.

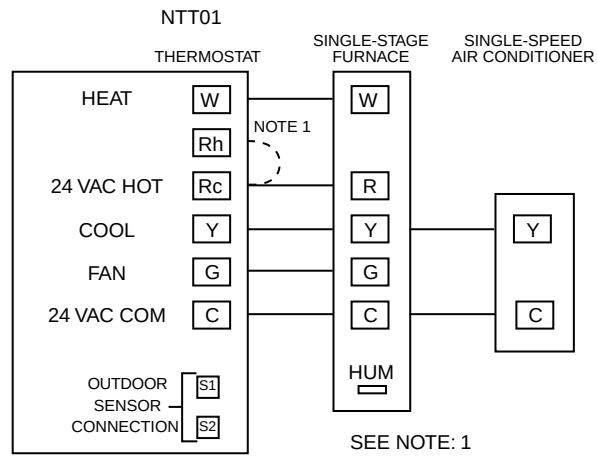
3. Terminals marked with “*” may not be present on equipment. Refer to indoor equipment installation instructions for proper set up and wiring information.

4. Refer to fan coil installation instructions for proper set up and wiring information.

5. With no field jumper applied, the Rh and W terminals are independent (dry contacts), which can be used to control typical boiler operation in heating. Refer to boiler installation instructions for proper set up and wiring information.

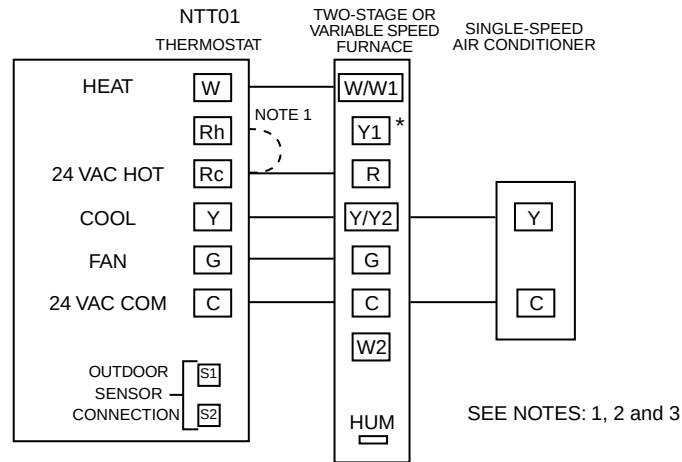
6. Refer to outdoor equipment installation instructions for proper set up and wiring information.

7. Configure thermostat to bring Fan (G) On With Any Heat (W) selection. See step 3 under Set Thermostat Configuration.



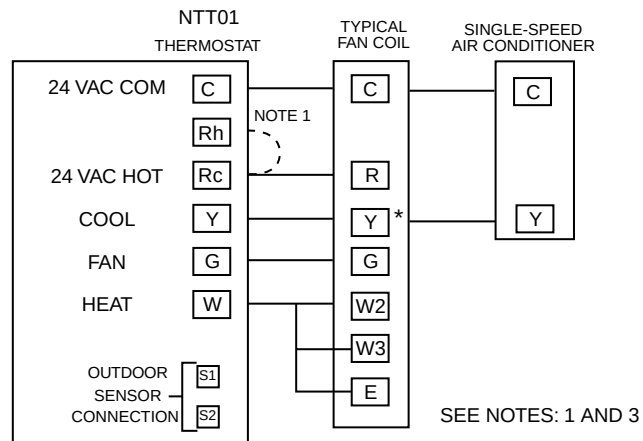
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→ **Fig. 2—Single Speed Air Conditioner with Single Stage Furnace**



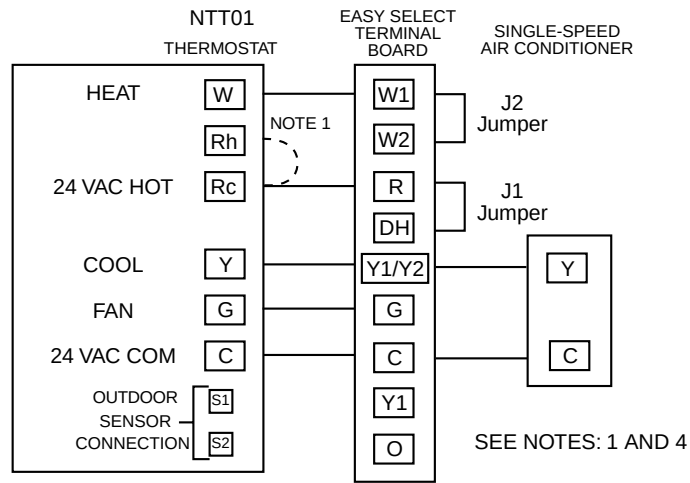
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→ **Fig. 3—Single Speed Air Conditioner with Two Stage or Variable Speed Furnace**



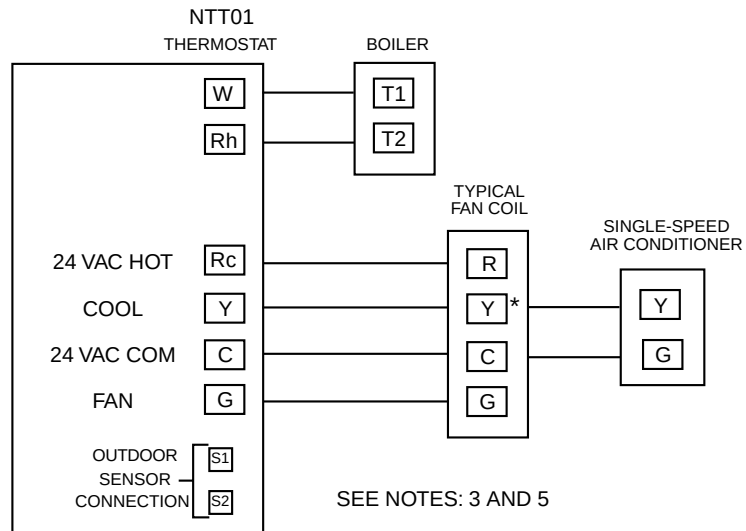
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→ **Fig. 4—Single Speed Air Conditioner with Typical Fan Coil**



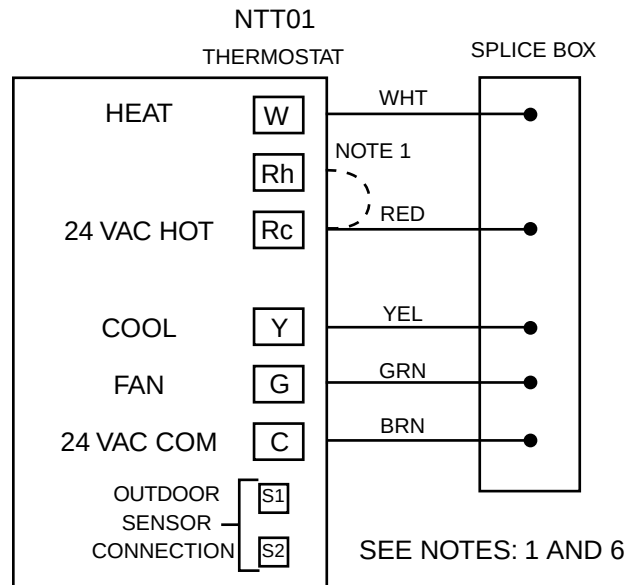
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→ **Fig. 5—Single Speed Air Conditioner with Variable Speed Fan Coil**



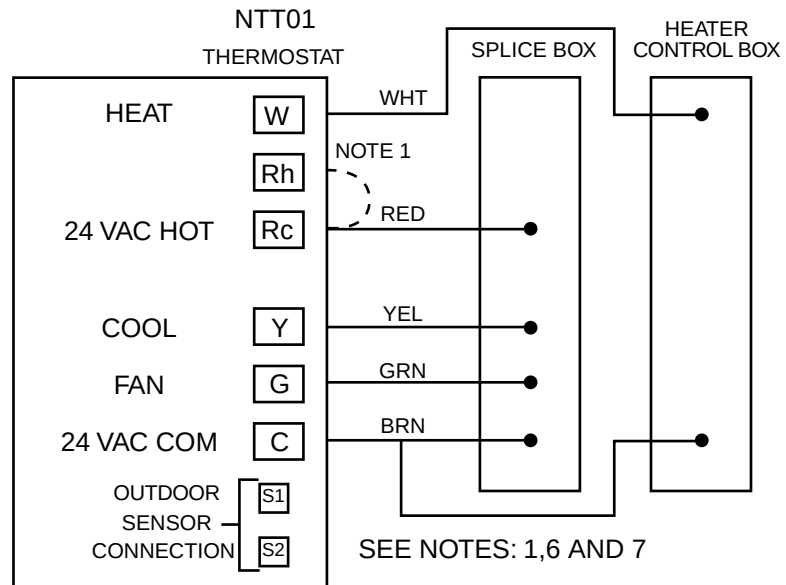
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→ **Fig. 6—Single Speed Air Conditioner with Boiler**



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→ **Fig. 7—Single Speed Air Conditioner with Single Stage Gas Furnace**



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→ **Fig. 8—Typical Single Speed Packaged Air Conditioner with Single Stage Electric Heat**

NON-PROGRAMMABLE THERMOSTAT CONFIGURATION RECORD

Date _____

Owner/Operator _____

Thermostat Model No. _____

A) Mode Settings

_____ Mode (Off, Heat, Cool, Auto)
_____ Heating Set Point Value
_____ Cooling Set Point Value
_____ Fan (Auto or On)

B) Configuration Options

1 _____ Anticipator (01-09: factory default = 03)
2 _____ Clean Filter Timer (OF or 01-09: factory default = 02)
3 _____ Fahrenheit or Celsius (F or C: factory default = F)
4 _____ Fan On with W (OF or ON: factory default = OF)
5-6 _____ N/A
7 _____ Zoning Selection (OF or ON: factory default = OF)
8-12 _____ N/A
13 _____ Room Temperature Offset (-5 to +5: factory default = 0)
14 _____ N/A
15 _____ Enable Auto Mode (OF or ON: factory default = ON)

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