Installation Instructions

Builder’s Model Thermostat TSTAT

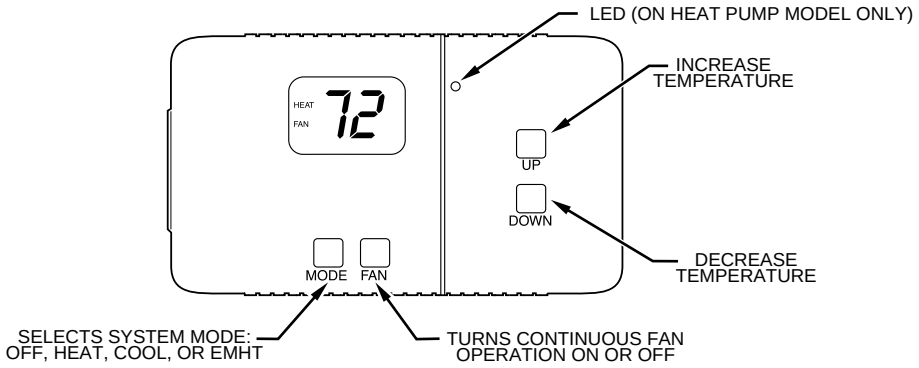

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Fig. 1—Builder’s Model Thermostat Keypad Display

NOTE: Read the entire instruction manual 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 you see this symbol on the equipment and 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 product and property damage.

INTRODUCTION

The Builder’s Model thermostat is an electronic 24-vac, non-programmable, manual changeover wall mount thermostat. This thermostat uses a single set point to maintain and control room temperature in both the heating and air conditioning modes. The thermostat is designed to maintain +/- 2°F accuracy. No batteries are required; temperature, fan, mode, and installer configuration settings are preserved with power off.

INSTALLATION CONSIDERATIONS

A. Air Conditioner Model

The Builder’s Model AC (air conditioner) thermostat may be wired with or without connecting a common wire between the indoor equipment and the thermostat. However, it is recommended to use a common wire whenever possible. Without a common wire this thermostat becomes "power stealing." This means it will need to steal a small amount of power from the equipment to which it is connected. When "power stealing" connection is used, the supplied 270 ohm resistor must be connected at the indoor unit. (See Fig. 2 and 3, and note 1.)

NOTE: Not all HVAC equipment is compatible with power stealing type thermostats. Consult the system equipment Installation Instructions before applying this thermostat in a power stealing manner.

⚠ CAUTION: Variable-speed furnaces (e.g. 58MVP/355MAV) are not compatible with a power stealing thermostat. A common wire MUST be applied in these applications.

B. Heat Pump Model

The Builder’s Model HP (heat pump) thermostat is not power stealing and MUST have both R and C wires connected to operate properly. This thermostat uses a green LED to indicate auxiliary heat and emergency heat operation. Heat pump thermostat may not be used with WeatherMaker/Zone Perfect Two-Zone systems.

INSTALLATION

PROCEDURE 1—THERMOSTAT LOCATION

Thermostat should be mounted:

- Approximately 5 ft (1.5m) from floor.
- Close to or in a frequently used room, preferably on an inside partitioning wall.

Form: IM-TSTAT-02 Cancels: New Printed in U.S.A. 4-98 Catalog No. 63TS-TA2

- On a section of wall without pipes or duct work.

Thermostat should NOT be mounted:

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

PROCEDURE 2—INSTALL THERMOSTAT

⚠ WARNING: Before installing thermostat, turn off all power to unit. There may be more than 1 disconnect. Electrical shock can cause personal injury or death.

1. Turn OFF all power to unit.
2. If an existing thermostat is being replaced:
   a. Remove existing thermostat from wall.
   b. Disconnect wires from existing thermostat, one at a time. Be careful not to allow wires to fall back into wall.
   c. As each wire is disconnected, record wire color and terminal marking.
   d. Discard or recycle old thermostat.

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

3. Separate front and back plastic assembly of thermostat.
4. Route thermostat wires through hole in mounting base. Level mounting base against wall (for aesthetic value only, thermostat need not be leveled for proper operation) and mark wall through 2 mounting holes.
5. Drill two 3/16-in. mounting holes in wall where marked.
6. Secure back plate to wall with 2 anchors and screws provided making sure all wires extend through hole in plastic.
7. Connect wires to proper terminal location inside thermostat.
8. Push any excess wire back into wall. Seal hole in wall to prevent air leaks. Leaks can affect thermostat operation. Any excess wire left inside thermostat casing may also affect thermostat operation by interfering with airflow across the temperature sensor.
9. Snap thermostat together making sure assembly is secure.
10. If "power stealing" connection is used, be sure to attach 270 ohm resistor at indoor unit. (See Fig. 2 and 3, and note 1.)
11. Turn on power to unit.

On power up, depending on the thermostat model being used, the LCD readout will display either, HC for the air conditioner model (1-stage heat/1-stage cool), or HP for heat pump model (2-stage heat/1-stage cool).

PROCEDURE 3—SET THERMOSTAT CONFIGURATION

Thermostat configuration options are the following:

1. Anticipator Value Adjustment
2. G (fan) ON with W (heat) Selection
3. Fahrenheit/Celsius Selection
4. O (reversing valve) ON with Heat or Cool.

An explanation for each configuration option is as follows.

A. To Enter the Configuration Mode:

Press and hold FAN button for approximately 10 sec until room temperature disappears and the display reads "1-". You are now in configuration mode.

NOTE: If FAN button is pressed again, or if no button is pressed for 2 minutes, the thermostat will exit configuration mode and return to normal operation. To re-enter configuration mode, the FAN button must be pressed and held for 10 sec again.

While in configuration mode, the following options are available:

OPTION 1—ANTICIPATOR VALUE ADJUSTMENT

This adjustment controls the sensitivity and cycle rate of the thermostat. Higher numbers decrease the sensitivity of the thermostat and slow down the cycle rate. Lower numbers increase the sensitivity and increase cycle rate. However, this feature will not allow more than 4 equipment cycles per hour (or 1 cycle every 15 minutes), regardless of setting. Values can range from 1 to 3. Factory default setting is 2. This default selection will provide optimum performance in nearly all installations. Try this setting first. Do not change setting unless there is evidence or need to do so. Unlike conventional anticipators, this setting is not to be determined by current draw. There is no need to measure, know, or compensate for current.

B. To Adjust:

1. Enter configuration mode (if not already there).
2. Use UP and DOWN buttons to display 1-.
3. Press MODE button once to display current value 02.

4. Use UP and DOWN buttons to move between values 01, 02, or 03.
5. Press MODE button to return to 1-. Use UP and DOWN buttons to now move between option choices 1-, 2-, 3-, 4-, or press FAN button to exit configuration mode.

OPTION 2—G (FAN) ON WITH W (HEAT) SELECTION

This selection determines whether 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 G signal. For these applications, select OFF. Some auxiliary heaters require a separate G signal from the thermostat to turn on the blower. In this case, select ON.

1. Enter configuration mode (if not already there).
2. Use UP and DOWN buttons to display 2-.
3. Press MODE button once to display current selection of OF (off).
4. Use UP and DOWN buttons to change between ON and OFF.
5. Press MODE button to return to 2-. Use UP and DOWN buttons to now move between option choices 1-, 2-, 3-, 4-, or press FAN button to exit configuration mode.

OPTION 3—FAHRENHEIT/CELSIUS SELECTION

This selection operates the thermostat in either Fahrenheit or Celsius.

TO SELECT:

1. Enter configuration mode (if not already there).
2. Use UP and DOWN buttons to display 3-.
3. Press MODE button once to display current selection of F (Fahrenheit).
4. Use UP and DOWN buttons to change between F and C.
5. Press MODE button to return to 3-. Use UP and DOWN buttons to now move between option choices 1-, 2-, 3-, 4-, or press FAN button to exit configuration mode.

OPTION 4—O (REVERSING VALUE) ON WITH HEAT OR COOL SELECTION

This selection is only available on heat pump model thermostats. This selection determines whether the reversing valve is energized in the heating or cooling mode.

TO SELECT:

1. Enter configuration mode (if not already there).
2. Use UP and DOWN buttons to display 4-.
3. Press MODE button once to display current selection of C (for energized while cooling).
4. Use UP and DOWN buttons to change between H and C.
5. Press MODE button to return to 4-. Use UP and DOWN buttons to now move between option choices 1-, 2-, 3-, 4-, or press FAN button to exit configuration mode.

PROCEDURE 4—THERMOSTAT OPERATION

A. Temperature Display

Thermostat will display room temperature until UP or DOWN button is pressed. The word SET appears when these buttons are pressed and the current set point is displayed. If no buttons are pressed for 5 sec, the display will change back to show room temperature.

B. Timeguard Timer

A 5-minute timeguard is built into the thermostat immediately upon power up, and any time the compressor turns off. The compressor will not turn on until the timeguard has expired. The timeguard affects only compressor operation. Pressing UP and FAN buttons simultaneously will override the timeguard for 1 cycle.

C. Cycle Timer

In normal heating and cooling operation the thermostat will not allow more than 4 equipment cycles per hour (or 1 cycle every 15 minutes). Both the Y and W outputs have a 15-minute timer that starts counting down when the output is turned on, (e.g., if Y output is turned on for 9 minutes and then satisfies, it cannot turn back on for another 6 minutes regardless of demand). However, pressing UP and FAN buttons simultaneously or changing the set point will override the timer for 1 cycle.

D. Minimum On Timer

Once the equipment has turned on, it will remain on for a minimum of 2 minutes regardless of demand. However, the equipment can turn off in less than 2 minutes if a change in set point, or a change in mode occurs.

E. Staging Timer

If the thermostat is a heat pump model, it has 2-stage heat capability. In normal operation there is a 15-minute delay between the first and second stages of heat. The Y output will energize first, then 15 minutes later, W is allowed to come on if the thermostat determines it is not satisfying the demand.

However, if the heating demand is greater than 5°, there will be only a 3-minute delay before bringing on W.

PROCEDURE 5—CHECK THERMOSTAT OPERATION

A. Fan Operation

1. Press FAN button. This will start continous fan operation. FAN annunciator will turn on.
2. Press FAN button again. This will stop continuous fan operation. FAN annunciator will turn off.

B. Heating Operation

1. Press MODE button until HEAT is displayed.
2. Press UP button until LCD readout reads 10° above room temperature. Press UP and FAN buttons simultaneously to defeat timers. Heating system should begin to operate immediately.
3. For HP thermostats only, press MODE button until EMHT (emergency heat) appears. Press UP and FAN buttons simultaneously to defeat timers. Emergency heating (W is ON, Y is OFF) should begin immediately.

C. Cooling Operation

1. Press MODE button until COOL is displayed.
2. Press DOWN button until LCD readout reads 10° below room temperature. Press UP and FAN buttons simultaneously to defeat timers. Cooling system should begin to operate immediately. **

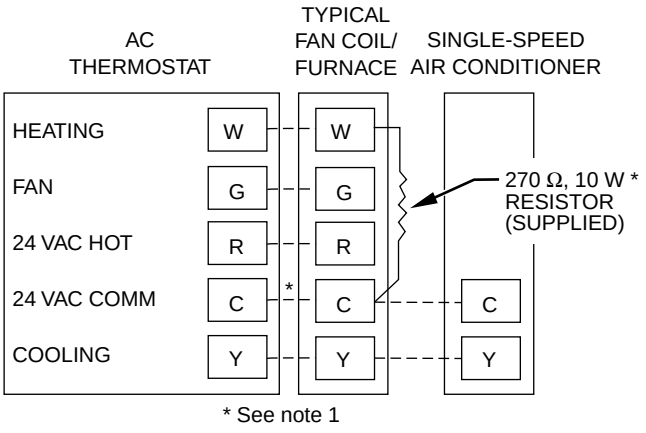

Fig. 2—Typical Air Conditioner

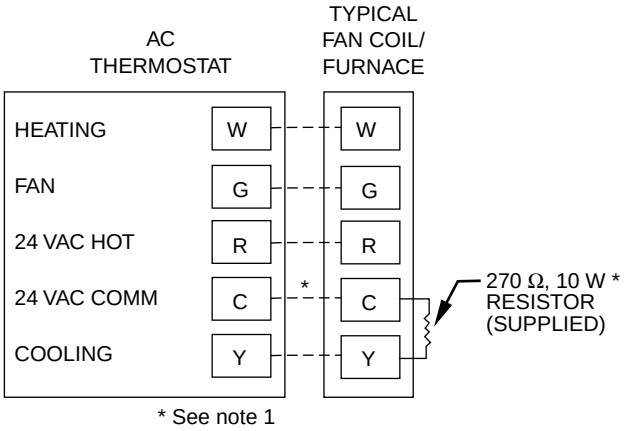

Fig. 3—Typical Heat Only

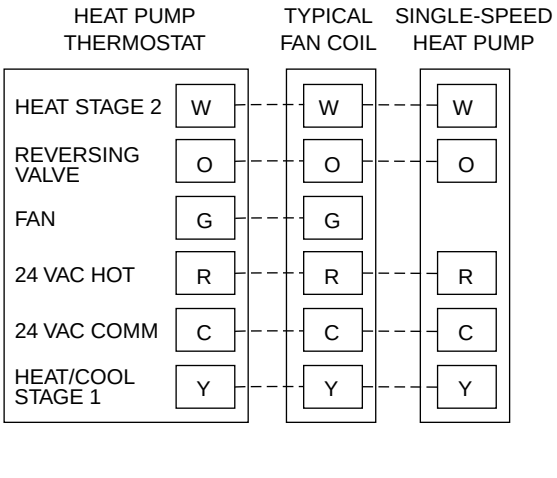

Fig. 4—Typical Heat Pump

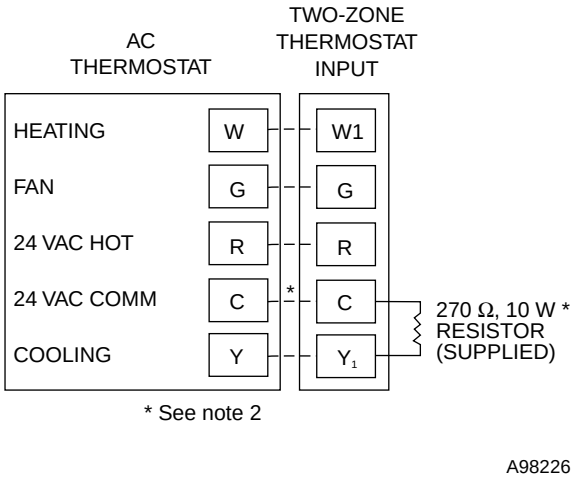

Fig. 5—Two-Zone with Air Conditioner

*WIRING DIAGRAM NOTES

1. If "power stealing" connection is used, leave off C connection between thermostat and equipment and add supplied 270 ohm resistor as shown.
2. Supplied 270 ohm resistor MUST always be connected between Y1and C at Two-Zone input as shown. Power stealing connection may not be used with the Two-Zone system.