

## T8000C, T8001C, T8024D Programmable Thermostats

### PRODUCT DATA



### FEATURES

- Attractive styling complements any decor to the homeowner's delight.
- Preprogrammed for your convenience.
- Program up to four time periods and temperature setpoints to complement your lifestyle.
- Programs are permanently held in non-volatile memory in the event of a power failure.
- Indefinite setpoint temperature hold for added comfort and energy savings.
- Ease-of-use means fewer homeowner questions and increased homeowner satisfaction.
- Large temperature display for quick easy readability.
- Conveniently sized thermostat (5-1/2 x 3-1/2) with optional decorator cover plates (7-3/8 x 5-3/4) make it easy to install in a variety of locations.
- Keys are located by the display for easy access.
- FAN and SYSTEM switches are located on the lower edge to eliminate accidental setting changes.
- Easy installation, setup and self-test saves time and increases installer productivity.
- Manual changeover from heat to cool eliminates unexpected system operation.
- °F or °C temperature display for added model flexibility.
- Selectable heating cycle rate (1, 3, 4, 5, 6, 9 or 12 cph) for a variety of applications which reduces the amount of inventory.
- Cooling cycle rate is fixed (3 cph), the standard setting for compressors, for speedy installation.
- Setpoints are permanently held in non-volatile memory (no batteries required) and retained during power outages for increased installer and homeowner convenience.
- Power stealing and hardwired models available for virtually all equipment and application needs including; gas, oil and electric forced air, condensing gas furnaces, forced air zoning systems, single stage heat pumps, hydronic heat, gravity and radiant floor heat systems.

### APPLICATION

The T8000C, T8001C and T8024D Programmable Thermostats provide programmable temperature control for 24 Vac heating-cooling systems with manual changeover from heat to cool. The T8000C and T8001C provide single-stage heating and cooling control and the T8024D provides two-stage heating and two-stage cooling control. Heating cycle rates are selectable at 1, 3, 4, 5, 6, 9, or 12 cph. Cooling cycle rates are fixed at 3 cph. Temperature indication can be set for °F or °C.

The T8000C is powered through the heating/cooling system controls. The T8001C and T8024D are powered directly through the system transformer.

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## SPECIFICATIONS

### IMPORTANT

The specifications given in this publication do not include normal manufacturing tolerances; therefore, an individual unit might not exactly match the listed specifications. Also, this product is tested and calibrated under closely controlled conditions, and some minor differences in performance can be expected if those conditions are changed.

The TRADELINE<sup>®</sup> models include a thermostat, wallplate and owner's guide. A 7 3/8 in. x 5 3/4 in. (188 mm x 146 mm) decorator cover plate (for covering wall marks) is available separately. Order Honeywell part no. 209649A (taupe) or part no. 209649B (white).

**Power:** 24 Vac nominal, 18 to 30 Vac, 50 or 60 Hz.

### Electrical Ratings:

#### T8000C:

Heating: .02-1.2A run; 3.5A inrush.  
Cooling: .02-1.2A run; 6.0A inrush.

#### T8001C and T8024D:

Heating: .02 to 1.5A run; 3.5A inrush.  
Cooling: .02 to 1.5A run; 7.5A inrush.

#### T8000C, T8001C and T8024D:

Fan: .02 to 0.5A run; 2.5A inrush.

### Current Draw:

T8000C Power Stealing Thermostat requires only 2.5 mA current draw when the thermostat calls for heat and is compatible with most 24V microprocessor systems. For further detail, see Power Stealing in the OPERATION section.

### Temperature Adjustment:

Setpoint temperature is adjusted by using the ▼ or ▲ keys. One press changes the setpoint one degree; pressing and holding changes the setpoint several degrees.

**Temperature Setting Range:** 30 to 99°F (4 to 37°C).

**Ambient Temperature Range:** 30 to 110°F (4 to 43°C).

**Shipping Temperature Range:** -20 to 120°F (-29 to 49°C).

**Operating Relative Humidity:** 5% to 90% RH, non-condensing.

### Cycle Rates (at 50% Load):

Heating: Selectable at 1, 3, 6, 9 or 12 cph. See Heating Cycle Rates, Table 1, for cycle rate options and corresponding system equipment.

Cooling: Fixed at 3 cph.

### Finish:

T8000C and T8024D TRADELINE<sup>®</sup> MODELS: are available in Premier White<sup>®</sup> and Taupe finish.  
T8001C MODELS: are available in Premier White<sup>®</sup> color.

### Accessory:

Decorator cover plates; for covering wall marks are available separately. Order Honeywell part no. 209649A for Taupe, or part no. 209649B for White. 7-3/8 in. (188 mm) x 5-3/4 in. (146 mm).

**Dimensions:** See Fig. 1.

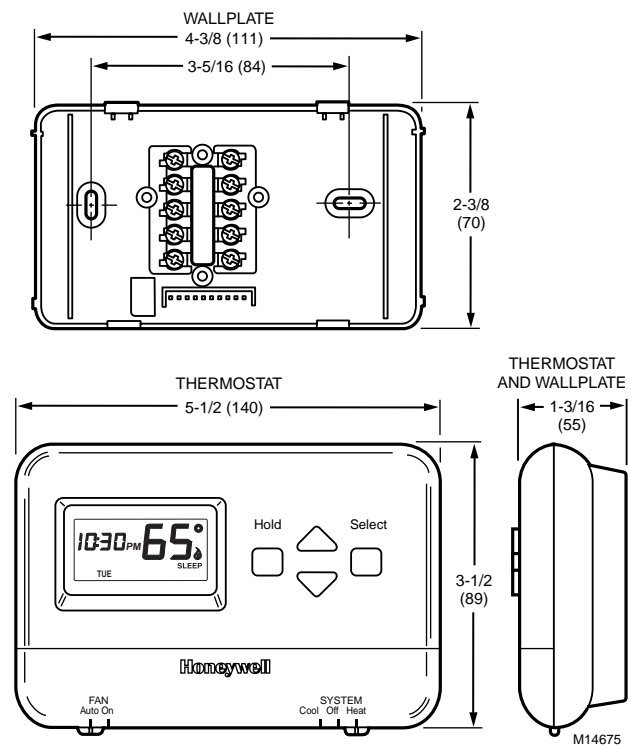


Fig. 1. T8000/T8001 Thermostat dimensions in in. (mm).

## ORDERING INFORMATION

When purchasing replacement and modernization products from your TRADELINE<sup>®</sup> wholesaler or distributor, refer to the TRADELINE<sup>®</sup> Catalog or price sheets for complete ordering number.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:

1. Your local Home and Building Control Sales Office (check white pages of your phone directory).
2. Home and Building Control Customer Relations  
Honeywell, 1885 Douglas Drive North, MN10-1461  
Golden Valley, Minnesota 55422-4386 1-800-468-1502

In Canada—Honeywell Limited/Honeywell Limitée, 35 Dynamic Drive, Scarborough, Ontario M1V 4Z9.

International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.

## INSTALLATION

### When Installing this Product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.



### CAUTION

**Damage to Heating/Cooling System Possible.**  
**Be careful when handling wires during installation.**  
 Disconnect power at furnace or main breaker/fuse box.



## MERCURY NOTICE

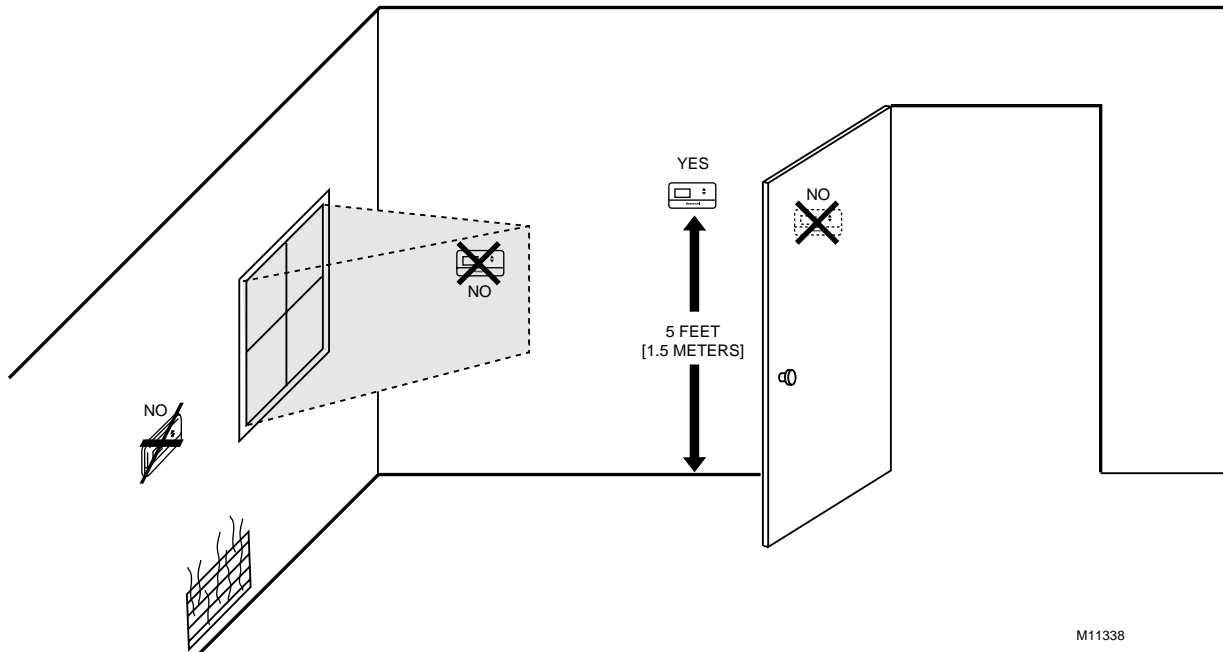
If this control is replacing a control that contains mercury in a sealed tube, do not place your old control in the trash. Dispose of it properly.

Contact your local waste management authority for instructions regarding recycling and the proper disposal of a control. If you have questions, call the Honeywell Customer Response Center at 1-800-468-1502.

### Location

Install the thermostat about 5 ft (1.5m) above the floor in an area with good air circulation at average temperature. See Fig. 2. Do not install the thermostat where it can be affected by:

- drafts or dead spots behind doors and in corners.
- hot or cold air from ducts.
- radiant heat from the sun or appliances.
- concealed pipes and chimneys.
- unheated (uncooled) areas such as an outside wall behind the thermostat.



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Fig. 2. Typical location of thermostat.

## Mounting Wallplate to Wall

### IMPORTANT

*Level only for appearance. The thermostat functions normally even when not level.*

Mount wallplate and the T8000C/T8001C with the screws provided (see Fig. 3) as follows:

1. Place the wallplate at the desired location on the wall.
2. Pull the thermostat wire through the wallplate entrance hole.
3. Fasten the wallplate to the wall using the anchors and screws provided.
4. After wiring the wallplate, plug the hole with non-flammable insulation to prevent drafts from affecting the thermostat; see Wiring section.

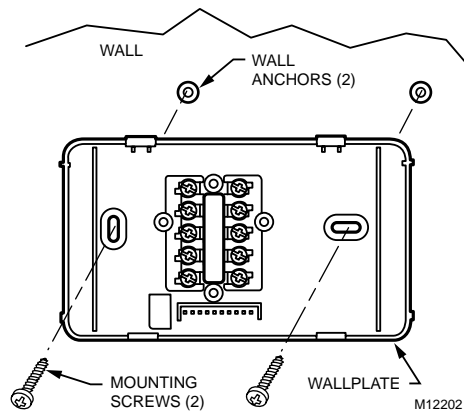


Fig. 3. Mounting wallplate to wall.

## Wiring

### IMPORTANT

Use an 18-gauge maximum wire for wiring the thermostats.

All wiring must comply with local electrical codes and ordinances. Disconnect the power supply to prevent electrical shock or equipment damage.

The shape of the terminals permits insertion of straight or wraparound wiring connections; either method is acceptable. A letter code is located near each terminal for identification. See Fig. 4.

NOTE: To ensure proper mounting of thermostat, restrict all wiring to the shaded area in the center of the terminals. See Fig. 5.

The T8000C Thermostats are powered through the heating/cooling system controls and are adaptable to most 18 to 30 Vac heating-cooling systems.

The T8001C and T8024D Thermostats are powered directly from the system transformer. The T8001C Thermostats are adaptable to most 18 to 30 Vac single-stage heating/cooling systems and the T8024D is adaptable to multistage systems. All T8001C and T8024D thermostats require a common wire connected to the system transformer to operate properly.

Refer to Fig. 6 through 10 for typical wiring hookups.

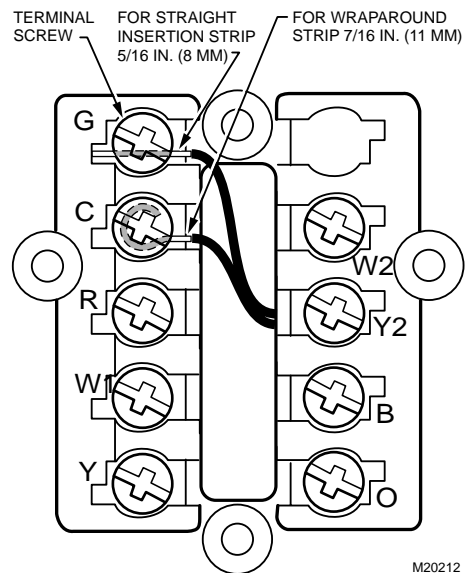


Fig. 4. Wiring connections.

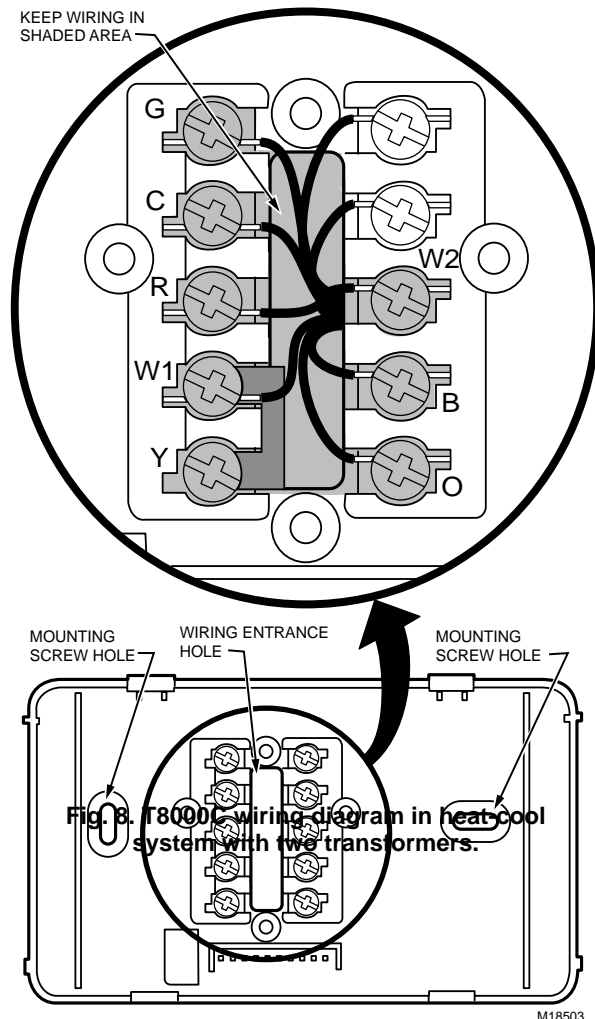


Fig. 8. T8000C wiring diagram in heat-cool system with two transformers.

Fig. 5. Restrict wiring to shaded area.

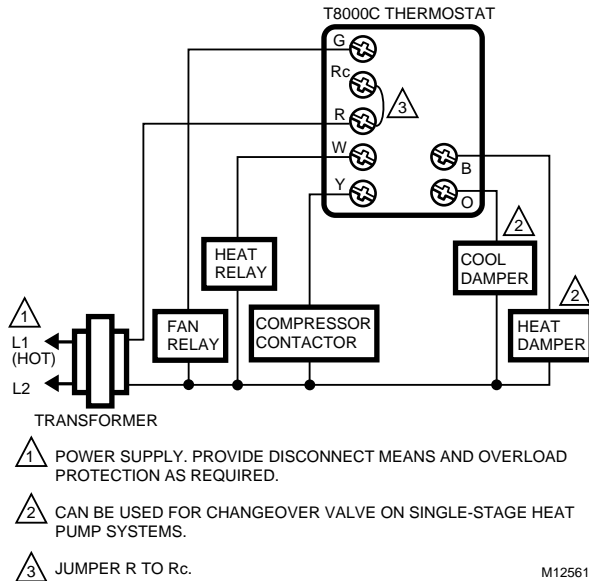


Fig. 6. T8000C heat-cool wiring diagram in single transformer system with gas heat/electric cooling.

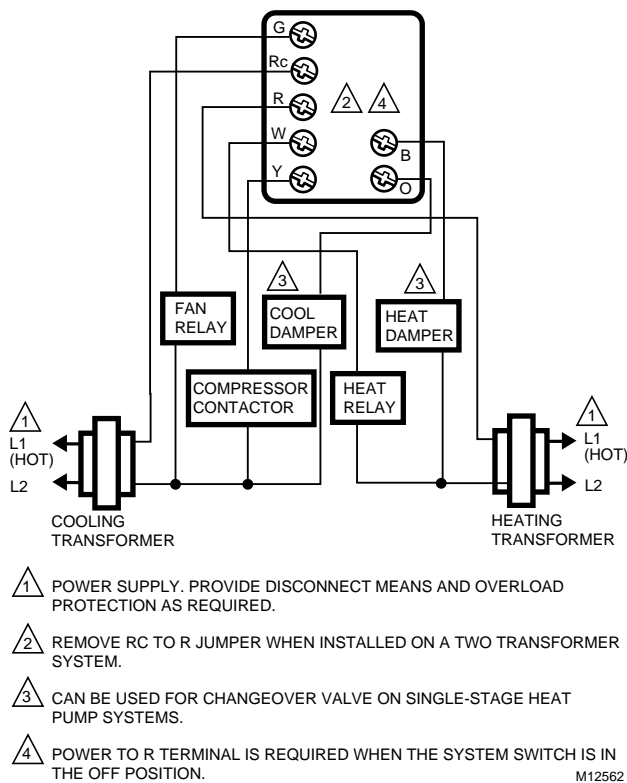


Fig. 7. T8000C wiring diagram in heat/cool system with two transformers.

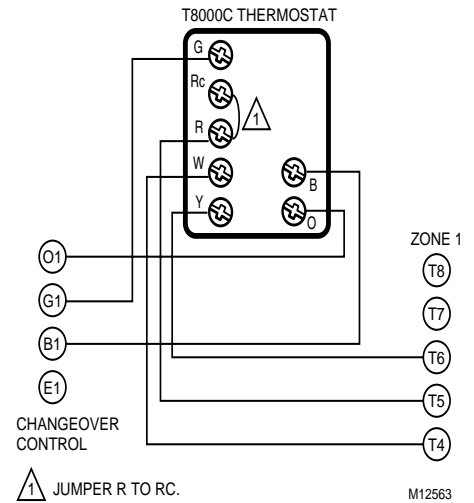


Fig. 8. T8000C heat-cool wiring diagram on a zone 1 MABS II Mastertrol control panel.

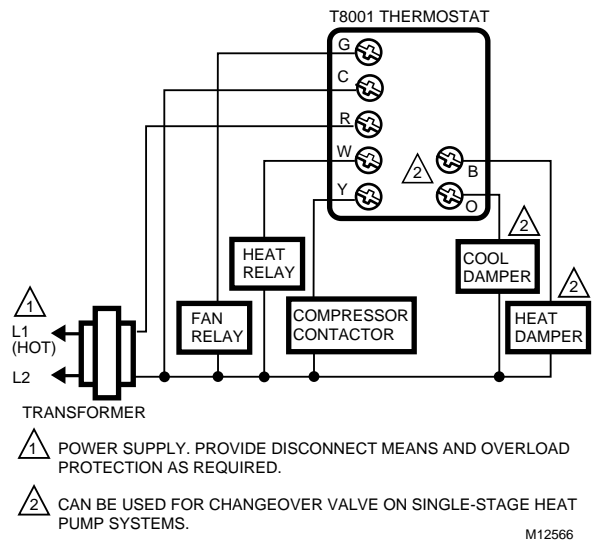


Fig. 9. T8001C heat-cool wiring diagram in single transformer system with gas heat/electric cooling.

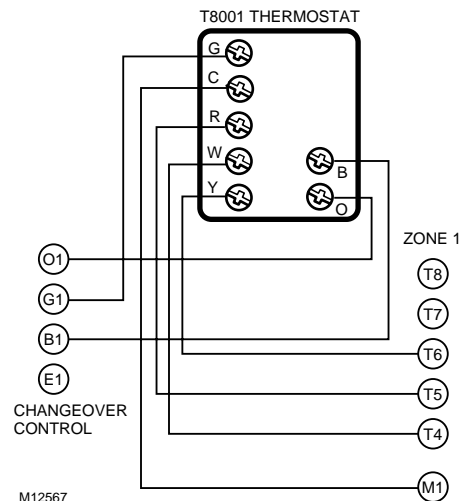


Fig. 10. T8001C heat-cool wiring diagram on a zone 1 MABS II Mastertrol control panel.

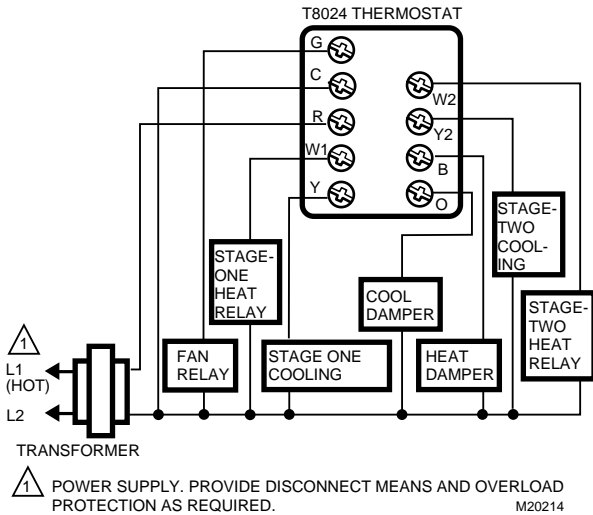


Fig. 11. T8024D multistage heat/cool wiring diagram.

### Setting Fan Operation (Fuel) Switch

The fan operation (fuel) switch is preset at the factory in the F position. See Fig. 11. This is the correct setting for most systems. If this system is an electric heat system, set the switch to the E position. The E setting allows the fan to turn on immediately with the heating or cooling equipment in a system where the G terminal is connected.

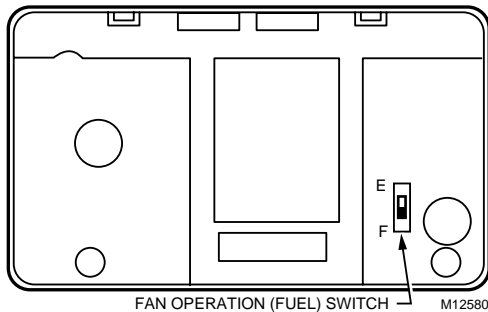


Fig. 12. Fan operation (fuel) switch.

### Mounting Thermostat to Wallplate

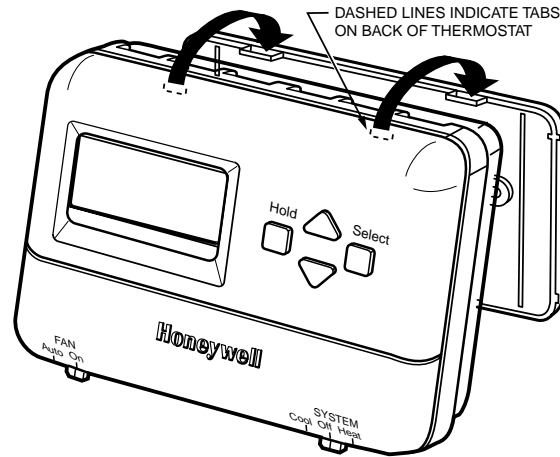
1. Slide SYSTEM switch to the Off position.
2. Engage the tabs at the top of the thermostat and wallplate.
3. Swing down the thermostat and press the lower edge of the thermostat onto the wallplate to latch.

### INSTALLER SETUP

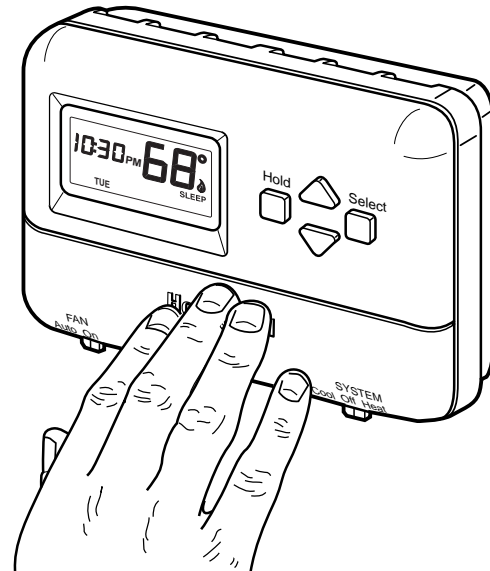
#### Setting °F/°C Indication and Heat Cycle Rate

The following instructions provide the information necessary to change the heating cycle rate to match the heating equipment and to choose either Fahrenheit (°F) or Celsius (°C) display.

NOTE: All four steps must be completed to save changes to the °F/°C indication and the heat cycle rate.


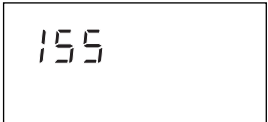
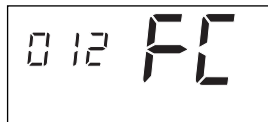


A ENGAGE TABS AT TOP OF THERMOSTAT WITH SLOTS ON WALLPLATE.



B PRESS LOWER EDGE OF CASE TO LATCH.

Fig. 13. Mounting thermostat to wallplate.

1. Enter Installer Setup.
  - a. Use ▲ or ▼ keys to set the temperature setpoint to 52 °F (11 °C).
 
  - b. Press the ▲ and ▼ keys simultaneously for more than two seconds to enter installer setup. When released a software revision code is displayed.
 
  - c. Press the ▲ key. Factory configuration (FC) is displayed (A typical example is shown, but information displayed varies by model. This information is for factory use only).
 

**Optional System Checkout**

When in steps 1c and 1d only, pressing the ▼ key can be used to turn heat or cool outputs on and off. Change the SYSTEM switch setting to test heat or cool outputs. No action takes place if the system switch is in the Off position.

Examples: System setting at HEAT: If heat is on, pressing the ▼ key turns it off; if heat is off, pressing the ▼ key turns it on.

System setting at COOL: If cool is on, pressing the ▼ key turns it off; if cool is off, pressing the ▼ key turns it on. The five minute minimum off time is bypassed.

NOTE: For T8024D, a second press ▼ turns on the 2nd stage.

**CAUTION**

Allow compressor to remain off for 5 minutes before restarting. Refer to manufacturer recommendations.

NOTE: In Installer Setup only, each press of the ▲ key momentarily displays 1. Each press of the ▼ key momentarily displays 2. When the keys are released, these one-digit codes are no longer displayed.

**2. Setting °C or °F.**

a. Press the ▲ key again to display the current setting.



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b. Press the ▼ key to change the °C or °F indication.



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**3. Setting number of heat/cool stages (T8024 only).**

a. Press ▲ to display number of cooling stages.



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b. Press ▼ to change number of cooling stages.



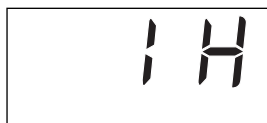
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c. Press ▲ to display number of heat stages.



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d. Press ▼ to change number of heat stages.



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**4. Setting 2nd Stage Heat Cycle Rate (see Table 1) for the cycle rate options and equipment).**

a. Press the ▲ key to display the current heat cycle rate setting of 1, 3, 6, 9, or 12 cph.



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NOTE: If the desired cycle rate is displayed, press the ▲ key to exit the installer setup.

b. To change the second cycle rate, press the ▼ key until your choice of 1, 3, 4, 5, 6, 9, or 12 is displayed.



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c. Press the ▲ key to display cooling algorithm configuration default.

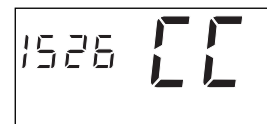


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d. Press the ▲ key again to change algorithm to C1 or C3.

C1 = Standard algorithm.  
C3 = Aggressive algorithm (can cause overshooting).

e. Press the ▲ key again. Current configuration (CC) is displayed. A typical example is shown, but CC varies by model. (This information is for factory use only.)



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**5. Exit Installer Setup.**

a. Press the ▲ key to save all changes and return to normal operation.



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**Table 1. Heating Cycle Rates**

System	Cycles Per Hour
Steam, Gravity	1
Hydronic Heat, Condensing Gas Furnaces <sup>a</sup>	3
Gas or Oil Forced Air	6
Electric Heat	9
Special Applications <sup>b</sup>	12

<sup>a</sup> High efficiency furnace (90+).

<sup>b</sup> Refer to the equipment manufacturer s Instructions.

## OPERATION

### Setting FAN and SYSTEM Switches

Fan and system settings are controlled manually by using the switches located at the bottom of the thermostat case. See Fig. 14.

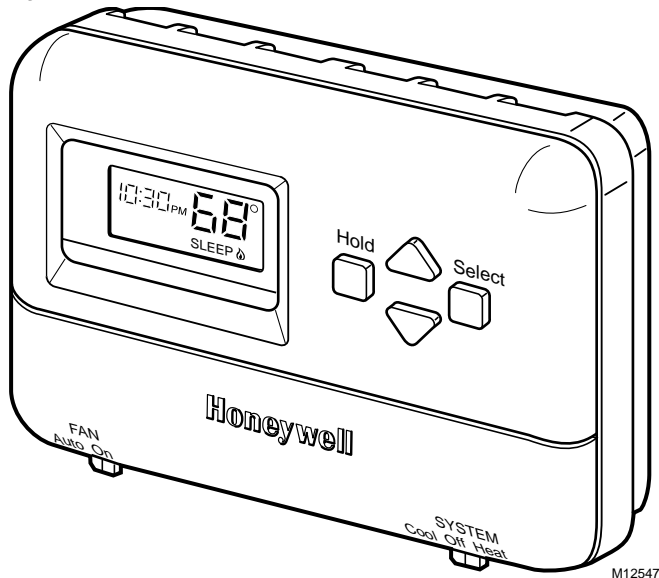


Fig. 14. Digital Display and System Switches.

### FAN Switch

Fan switch settings are:

- On: The fan runs continuously. Use for improved air circulation and air quality.
- Auto: Normal setting for most homes. In cooling, the fan starts and stops with the cooling equipment. In heating, the fan is controlled directly by the heating equipment and may start a few minutes after the heating equipment turns on (most systems). When the fan operation (fuel) switch is in the E position, the fan starts and stops with the heating equipment.

Slide the FAN switch in the lower left corner of the thermostat to select the desired fan setting.

### SYSTEM Switch

System switch settings control thermostat operation as follows:

- Cool: The thermostat controls the cooling system.
- Off: Both heating and cooling are off.
- Heat: The thermostat controls the heating system.

Slide the SYSTEM switch in the lower right corner of the thermostat to select the desired system setting.

## PROGRAMMING

The thermostat is flexible and can be programmed for different schedules for weekdays and weekends.

Four time periods are available during weekdays and weekends WAKE, LEAVE, RETURN, and SLEEP.

### IMPORTANT

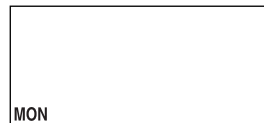
*Always press the keys with your fingertip or similar blunt tool. Sharp instruments like pens and pencil points can damage the keyboard.*

### Setting the Current Time and Day

1. To Set Current Time.
  - a. Press Select twice.
  - b. Press ▲ or ▼ to set current time. While setting the current time, the word SET is displayed.
2. To Set Day of Week.
  - a. Press Select again.
  - b. Press ▲ or ▼ to set current day.



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NOTE: To use the preprogrammed time and temperature (see Table 2), press Hold to exit Programming.

Table 2. Preprogrammed Time and Temperature Settings.

Period	Time	Heat Setpoint	Cool Setpoint
Wake	6:00 AM	70°F (21°C)	78°F (26°C)
Leave	8:00 AM	62°F (17°C)	85°F (29°C)
Return	6:00 PM	70°F (21°C)	78°F (26°C)
Sleep	10:00PM	62°F (17°C)	82°F (28°C)

### Setting the Weekday Program

Slide the SYSTEM switch to the position, heating or cooling, you want to program. The flame (heating) or the snowflake (cooling) will appear in the lower right corner of the display.

3. WAKE
  - a. Press Select. Press ▲ or ▼ to set WAKE time.
  - b. Press Select. Press ▲ or ▼ to set WAKE temperature.
4. LEAVE
  - a. Press Select. Press ▲ or ▼ to set LEAVE time.
  - b. Press Select. Press ▲ or ▼ to set LEAVE temperature.



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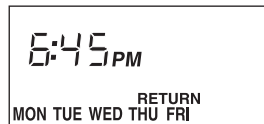
M12625B



M12626A



M12627A



M12628A



M12629A

5. RETURN
  - a. Press Select. Press ▲ or ▼ to set RETURN time.
  - b. Press Select. Press ▲ or ▼ to set RETURN temperature.

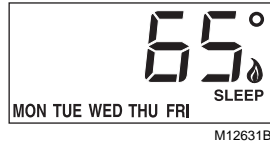


**6. SLEEP**

- a. Press Select.  
Press ▲ or ▼ to set SLEEP time.

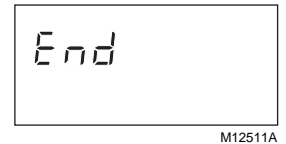


- b. Press Select.  
Press ▲ or ▼ to set SLEEP temperature.



**11. End Programming.**

Press Select. End is displayed. Programming is complete. The thermostat will revert to displaying the current day, time and temperature in five seconds.



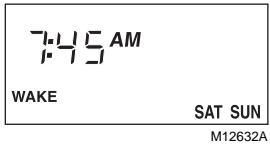
**NOTE:** To reset the thermostat to the preprogrammed time and temperature settings (see Table 1):

1. Press and hold the Hold and Select keys simultaneously. The display will begin counting down from 36 to zero.
2. The thermostat display will go blank, then will display the current time and temperature.
3. Release keys, the program has reverted to the preprogrammed settings.

**Setting the Weekend Program**

**7. WAKE**

- a. Press Select.  
Press ▲ or ▼ to set WAKE time.

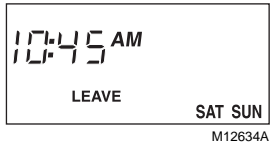


- b. Press Select.  
Press ▲ or ▼ to set WAKE temperature.



**8. LEAVE**

- a. Press Select.  
Press ▲ or ▼ to set LEAVE time.

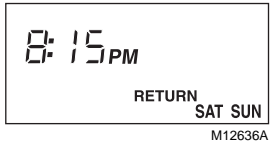


- b. Press Select.  
Press ▲ or ▼ to set LEAVE temperature.



**9. RETRUN**

- a. Press Select.  
Press ▲ or ▼ to set RETRUN time.

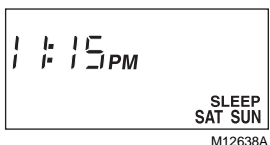


- b. Press Select.  
Press ▲ or ▼ to set RETRUN temperature.



**10. SLEEP**

- a. Press Select.  
Press ▲ or ▼ to set SLEEP time.



- b. Press Select.  
Press ▲ or ▼ to set SLEEP temperature.

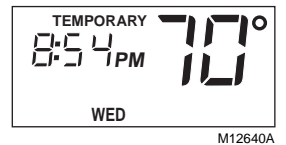


**Setting Temperature Hold**

Slide the SYSTEM switch to the heat or cool position.

**Temporary Temperature Hold**

1. Press ▲ or ▼ key to set a temporary temperature setting.

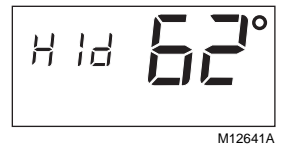


**NOTE:** The temporary temperature setting is displayed for approximately 3 seconds. The setting remains in effect until the next program period. To cancel, press Hold twice.

**Indefinite Temperature Hold**

The Hold key allows you to indefinitely hold a temperature. When Hold is active, the letters Hld are displayed continuously. Hold can be canceled by pressing the Hold key again.

1. Press Hold
2. Press ▲ or ▼ key to set indefinite temperature setting.



**NOTE:** Indefinite hold remains in effect until the Hold key is pressed to cancel it.

**CHECKOUT**

**Heating**

1. Slide the SYSTEM switch to Heat and the FAN switch to Auto.
2. Press and hold the ▲ key to raise the temperature setting several degrees above the room temperature; the heating equipment should start. In conventional systems, the system turns on the fan through the use of a time delay relay or through a limit control. When the fan operation (fuel) switch is in the E position, the fan starts immediately.
3. Press the ▼ key to lower the temperature setting below the room temperature. Heating equipment should stop.

## Cooling

### CAUTION

**Damage To Compressor Possible.**  
**Operating at too low of an outdoor temperature may cause compressor damage.**  
 Do not operate cooling if outdoor temperature is below 50°F (10°C).  
 Allow compressor to remain off for five minutes before restarting. Refer to manufacturer's recommendations.

1. Slide the SYSTEM switch to Cool and the FAN switch to Auto.
2. Press the ▼ key to lower the temperature setting several degrees below the room temperature; the cooling equipment should start. The fan starts and stops with the cooling equipment.
3. Press the ▲ key to raise the temperature setting above the room temperature. Cooling system should shut down.

NOTE: To prevent damage to the compressor the T8000C/T8001C have a built-in off-timer. See page 11.

## Fan

1. Slide the SYSTEM switch to Off and the FAN switch to On. The fan should run continuously.
2. Slide the FAN switch to Auto. In heating, the fan is controlled directly by the heating equipment and may start a few minutes after the heating equipment turns on (most systems). When using an electric heat

thermostat, the fan starts and stops with the heating equipment. In cooling, the fan starts and stops with the cooling equipment.

Make certain all equipment responds properly to the thermostat.

## Power Stealing

Unlike hard wired thermostats which are powered directly from the system transformer, the T8000C Thermostat steals power through the heating and cooling system controls and can be used in applications where existing wiring does not permit using hard wired thermostats. See Fig. 15 and 16.

Previous Honeywell power stealing thermostats required 80 mA of load current when the heating and cooling was on. The T8000C Thermostat requires only 2.5 mA of load current (1/32 of previous models) when the heating or cooling is on. When the heating or cooling is off, the thermostat operates at 0.1 mA (1/100 of previous models). Other Honeywell power stealing thermostats are available, but they have different powering requirements than the T8000C. This low current draw makes the T8000C applicable to most 24V heating and cooling systems.

The thermostats only operate when mounted on the wallplate with 24V applied. Batteries are not required for operation because temperature setpoints and configuration settings are retained permanently in nonvolatile memory.

The T8000C is packaged with a 7870 ohm resistor to insure compatibility with TACO zone valves. See Fig. 17.

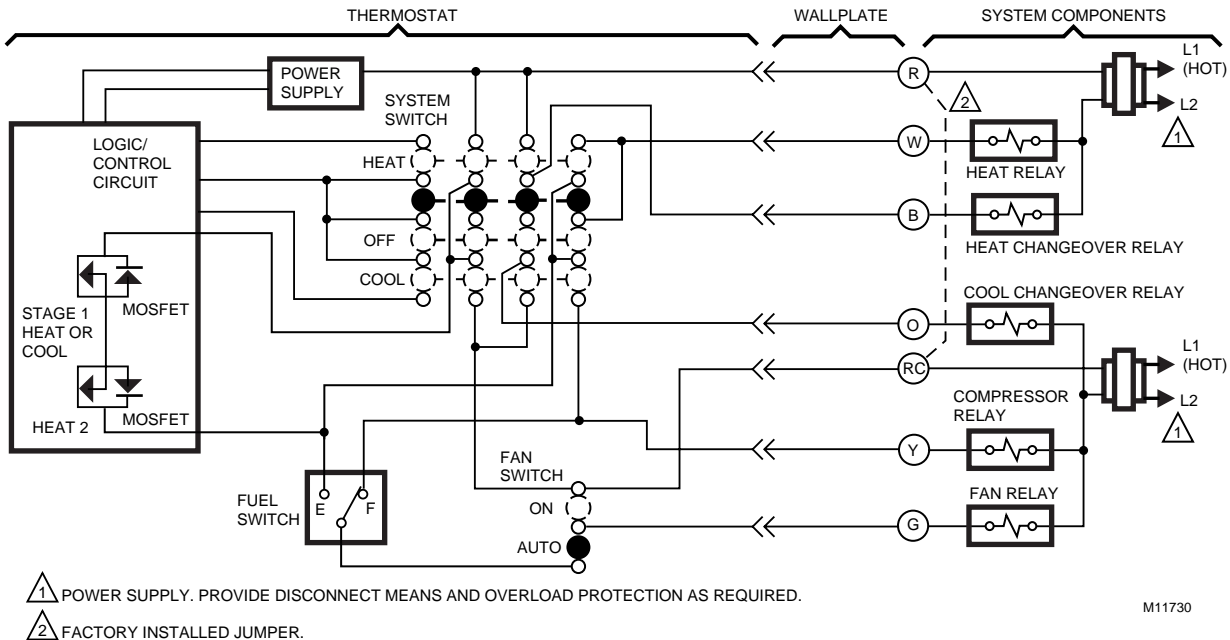


Fig. 15. T8000C power stealing internal schematic.

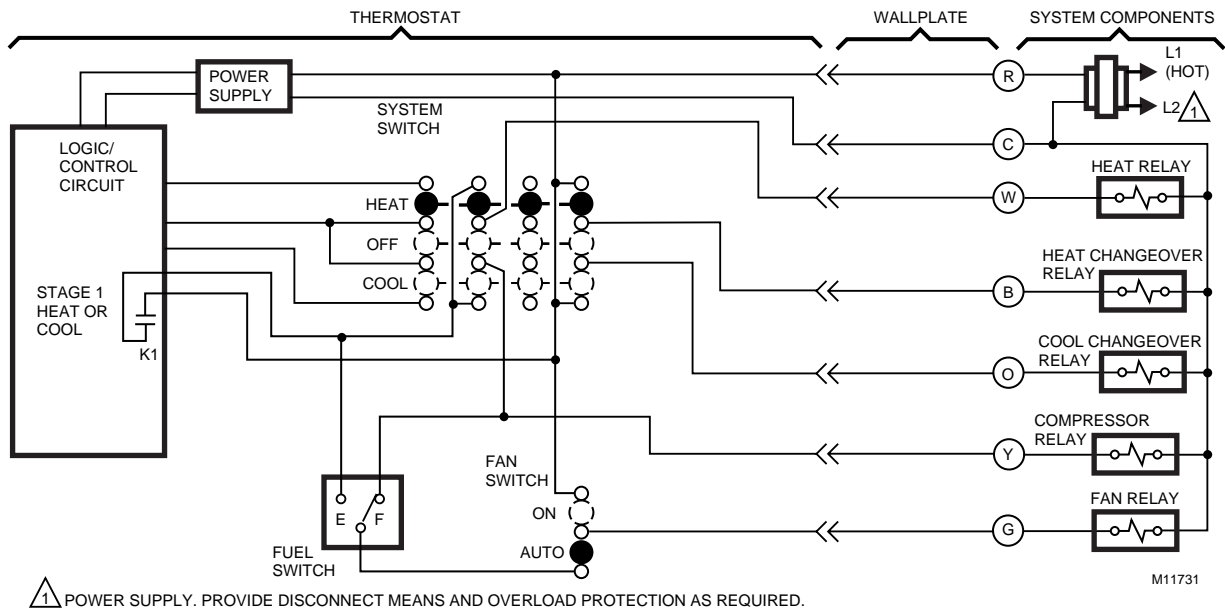


Fig. 16. T8001C hardwired internal schematic.

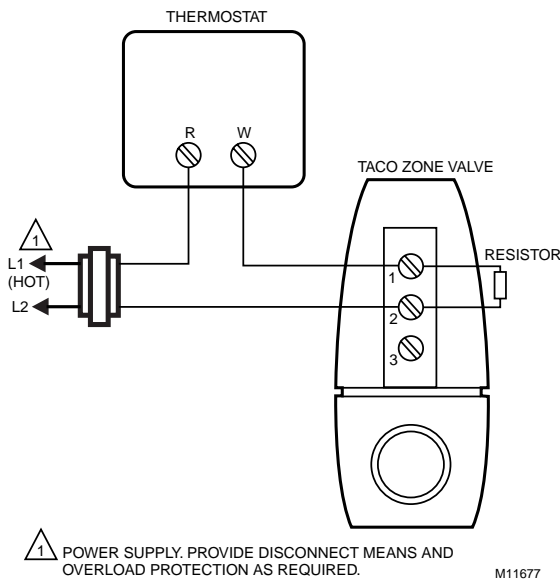


Fig. 17. Connect resistor to the TACO zone valve terminal numbers 1 and 2.

### Sequence of Operations

The Fan, Heat and Cool outputs are relay or mosfet controlled. A loss of ac power or a change in the SYSTEM switch setting can cause the outputs to turn off. The truth table shows the sequence of operations for the FAN settings and SYSTEM modes. See Table 3, Sequence of Operations.

### Minimum Off-Timer

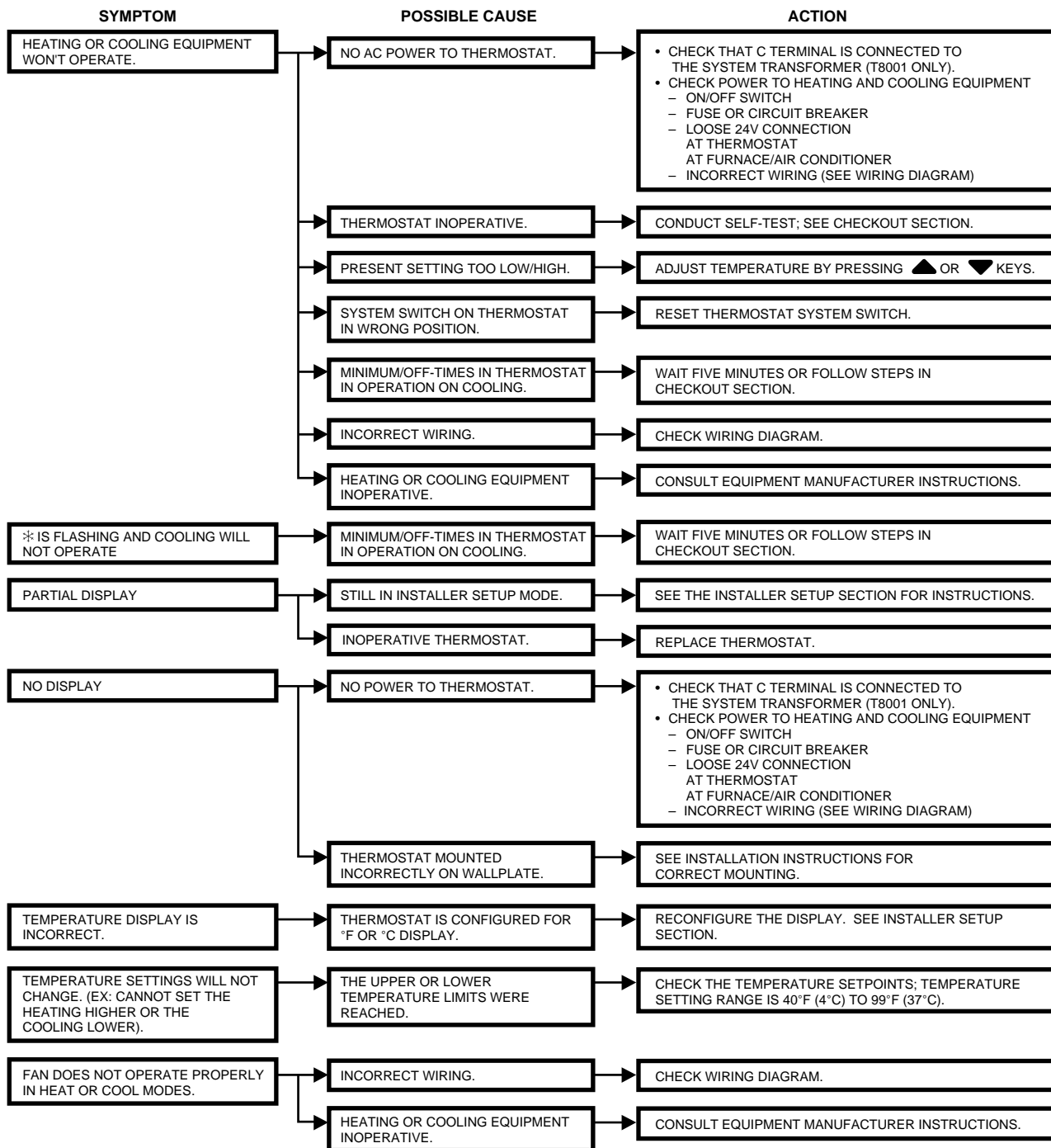
A minimum off-timer in the T8000C and T8001D assures that the compressor does not come on again for at least five minutes after it turns off. The minimum off-timer is triggered when the compressor turns off and when the SYSTEM switch position is changed. If the compressor turns off when the setpoint is changed, the minimum off-timer is triggered. Power interruption and power restoration also trigger the minimum off-timer. The minimum off-timer operates in cooling on the T8000C and T8001C. A flashing snowflake ❄ indicates the minimum off-timing is in effect.

Table 3. Sequence of Operations.

FAN Switch Settings	SYSTEM Switch Settings	Call for Action	Energize Terminals	Display Icons
Auto	Off	None	None	None
On	Any	Any	G	None
Auto	Cool	Cooling	G, Y	❄
Auto	Heat	Heating	W, G <sup>a</sup>	🔥

<sup>a</sup> When the Fuel switch is in the E position.

## TROUBLESHOOTING T8000/T8001



M11733

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