

**TRADELINE®**

## T874G Thermostats and Q674F,J Subbases for Heat Pump Systems

Installation Instructions for the Trained Service Technician.

### Application

The T874G Thermostats and Q674F,J Subbases provide 24 to 30 Vac control of 2-stage heating and 1-stage cooling heat pump systems with automatic changeover. Stage 1

heat and cool anticipation is fixed voltage type; stage 2 heat anticipation is adjustable (except as noted). See Table 1 for specific T874G/Q674F,J combinations and specifications.

TABLE 1—THERMOSTAT/SUBBASE SPECIFICATIONS.

Thermostat/ Subbase Package	Thermostat/ Subbase Model Numbers	LED Indication	Switching		Changeover	Comments	See Fig.
			System	Fan			
Y594G1252	T874G1246/ Q674F1212	AUX.HT., EM.HT. <sup>a</sup>	EM.HT.-OFF- HEAT-AUTO- COOL	AUTO- ON	AUTO, COOL	TRADELINE®	5
—	T874G1246/ Q674F1410	AUX.HT., EM.HT. <sup>a</sup>	EM.HT. <sup>b</sup> -OFF- HEAT-AUTO- COOL	AUTO- ON	AUTO, COOL	Separate W1 and Y1 terminals; TRADELINE® subbase.	6
Y594G1419	T874G1642/ Q674F1444	AUX.HT., EM.HT., CHECK	OFF-EM.HT.- HEAT-AUTO- COOL	AUTO- ON	AUTO, HEAT OR COOL	SUPER TRADELINE®, includes factory-installed jumper across W1 and Y1; fixed stage 2 heat anticipation. Isolated CHECK LED includes jumper for connecting X2 terminal to X or R for power.	7
Y594G1476 <sup>c</sup>	T874G1741/ Q674F1477						
Y594G1534 <sup>d</sup>	T874G1824/ Q674F1477						
Y594G1526	T874G1626/ Q674F1436	AUX.HT., EM.HT.	OFF-EM.HT.- HEAT-AUTO- COOL	AUTO- ON	AUTO, HEAT	TRADELINE®	8
—	T874D1165 or T874E1016/ Q674F1543	(RED) <sup>e</sup>	OFF-EM.HT.- HEAT-AUTO- COOL	AUTO- ON	AUTO	TRADELINE®subbase; exact replacement for York model no. 2TB04700524. Thermostat not included; order separately.	9
Y594G1567	T874G1865/ Q674J1209	EM.HT.	EM.HT.- AUTO-OFF	AUTO- ON	AUTO, COOL	TRADELINE®; exact replacement for York model nos. 2TH11702424 and 6TH11702424.	10
Y594G1575 <sup>c</sup>	T874G1873/ Q674J1225	EM.HT.	EM.HT.- AUTO-OFF	AUTO- ON	AUTO, COOL	TRADELINE®; exact replacement for York model nos. 2TH11702424 and 6TH11702424.	10
Y594G1633	T874G1972/ Q674F1584	AUX.HT., EM.HT.	OFF-EM.HT.- HEAT-AUTO- COOL	AUTO- ON	AUTO, HEAT OR COOL	TRADELINE®	11

<sup>a</sup> EM.HT. also shows compressor malfunction.

<sup>b</sup> When switch is in EM. HT. position, the emergency heat will operate continuously until system switch is moved to another position.

<sup>c</sup> Thermostat is white and subbase is gray.

<sup>d</sup> Sold only in Australia; degrees C.

<sup>e</sup> LED indicator is not labeled but may be connected per user's requirements. See Fig. 9.

# Operation

On a 2-stage heating thermostat, the two stages of heat make sequentially as the temperature drops. *Make* refers to the mercury switch initiating a call for heat or cool.

There are about 2° F [1° C] between stages so the second stage makes only when the first stage cannot handle the load. This 2° F [1° C] is referred to as the *interstage differential*.

The LED indicators are light emitting diodes on the subbase that light up when something specific happens within the system. When an LED lights up, refer to the following list for the meaning:

EM.HT.: Emergency heat is operating, which means the system switch is at EM. HT.

AUX.HT.: Auxiliary heat is operating, which means the weather is so cold that the heat pump can not handle the load alone.

CHECK: System needs to be checked. See Heating/Cooling System Instructions for specific meaning. LEDs are not field replaceable or addable.



## Recycling Notice

This control contains mercury in a sealed tube. Do not place control in the trash at the end of its useful life.

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

Contact your local waste management authority for instructions regarding recycling and the proper disposal of this control, or of an old control containing mercury in a sealed tube.

# Installation

## WHEN INSTALLING THIS PRODUCT...

1. Read these instructions carefully. Failure to follow them could 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

1. Disconnect power supply to prevent electrical shock or equipment damage.
2. To prevent interference with the thermostat linkage, keep wire length to a minimum and run wires as close as possible to the subbase.
3. Do not overtighten thermostat captive mounting screws because damage to subbase threads can result.
4. Do not short across coil terminals on relay. This may burn out the thermostat heat anticipator.
5. Never install more than one wire per terminal unless factory-supplied jumper with spade terminal is used.

**IMPORTANT:** Thermostats are calibrated at the factory by using subbases mounted at true level. Inaccurate subbase leveling will cause thermostat control deviation.

## LOCATION

Install the thermostat about 5 ft [1.5 m] above the floor in an area with good air circulation at average temperature.

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 sun or appliances.
- concealed pipes and chimneys.
- unheated (uncooled) areas such as an outside wall behind the thermostat.

## MOUNTING THE SUBBASE

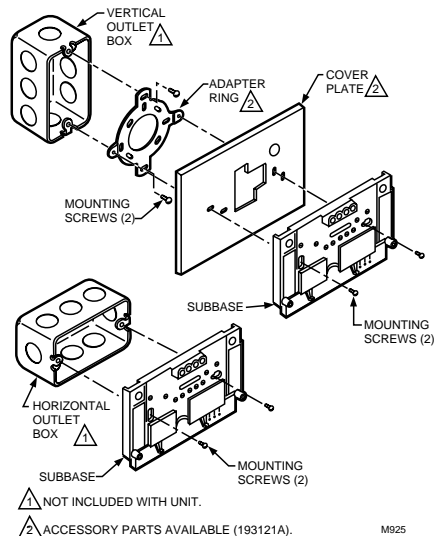
The thermostat subbase can be mounted on a vertical outlet box, horizontal outlet box or directly on the wall.

1. If you must mount the subbase on a vertical outlet box, order 193121A (beige) or 202689A (gray) Adapter Assembly. See Fig. 1. The assembly includes an adapter ring, two screws and a cover plate to cover marks on the box. Install the ring and cover plate on the vertical outlet box.

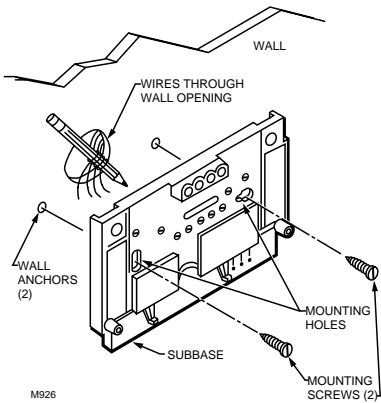
For a wall installation, hold subbase in position and mark holes for anchors. See Fig. 2. Obtain wall anchors locally. Set subbase aside. Drill four 3/16 in. [5 mm] holes and gently tap anchors into the holes until flush with the wall.

2. Run wires to the thermostat location. See wiring diagrams, Figs. 5-11.

**Fig. 1—Installation of Q674 Subbase on outlet box.**



**Fig. 2—Installation of Q674 Subbase on wall.**



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**IMPORTANT:** Use 18 gauge, color-coded thermostat cable for proper wiring.

3. Pull wires through the cover plate (if used) and sub-base cable opening. See Fig. 3. Take care that wires do not fall back into the wall opening.

4. Secure the cover plate (if used) and subbase with the screws provided. Do not fully tighten the subbase screws.

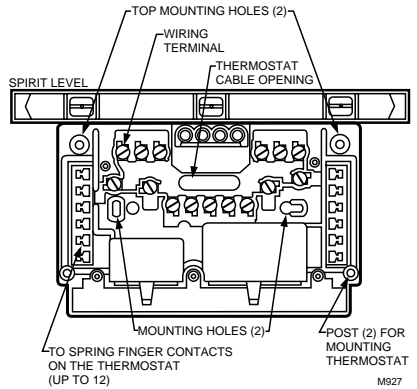
5. Level the subbase using a spirit level, as shown in Fig. 3, and firmly tighten subbase mounting screws. The subbase mounting holes provide for minor out-of-level adjustments.

**IMPORTANT:** An incorrectly leveled subbase will cause the temperature control to deviate from set point.

#### WIRING THE SUBBASE

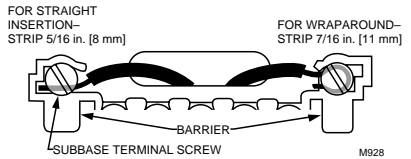
All wiring must comply with local electrical codes and ordinances. Follow equipment manufacturer wiring instructions when available. To wire subbase, proceed as follows:

**Fig. 3—Subbase components and leveling procedure.**



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**Fig. 4—Wiring Connections.**



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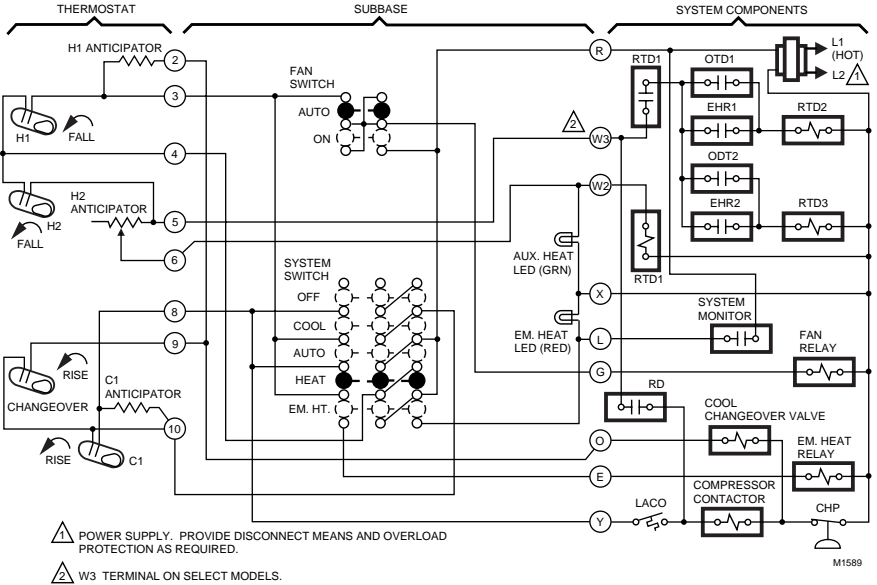
1. Connect the system wires to the subbase as shown in Figs. 5-11. A letter code located near each terminal is for identification. The terminal barrier permits straight or conventional wraparound wiring connection. See Fig. 4.

2. Firmly tighten each terminal screw.

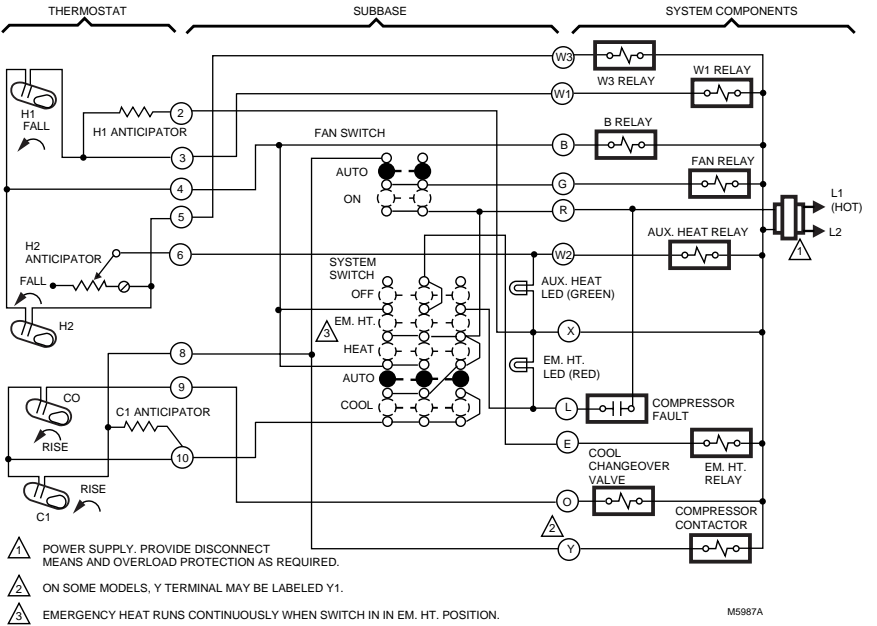
3. Fit wires as close as possible to the subbase. Push excess wire back into the hole.

4. Plug hole with nonflammable insulation to prevent drafts from affecting the thermostat.

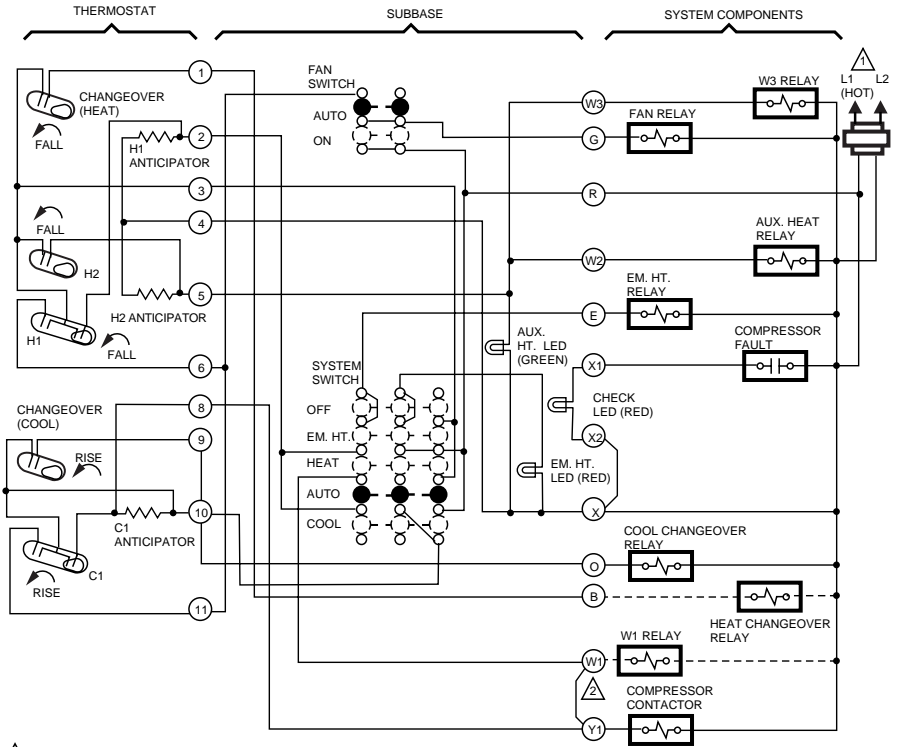
**Fig. 5—Internal schematic and typical wiring diagram for Y594G1252 (T874G1246/Q674F1212); auto changeover in cooling.**



**Fig. 6—Internal schematic and typical wiring diagram for T874G1246/Q674F1410. Separate W1 and Y1 terminals can be jumpered together to form Y terminal.**



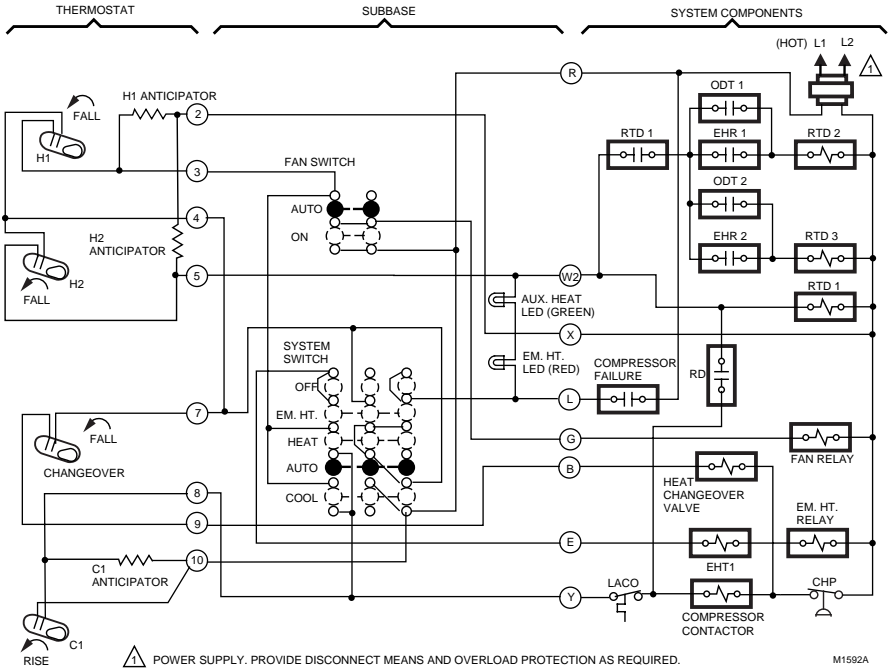
**Fig. 7—Internal schematic and typical wiring diagram for Y594G1419 (T874G1642/Q674F1444), Y594G1476 (T874G1741/Q674F1477) and Y594G1534 (T874G1824/Q674F1477 sold only in Australia); auto changeover in heating and cooling; fixed anticipation. CHECK LED has isolated terminals. Factory-installed W1-Y1 jumper is equivalent to Y terminal.**



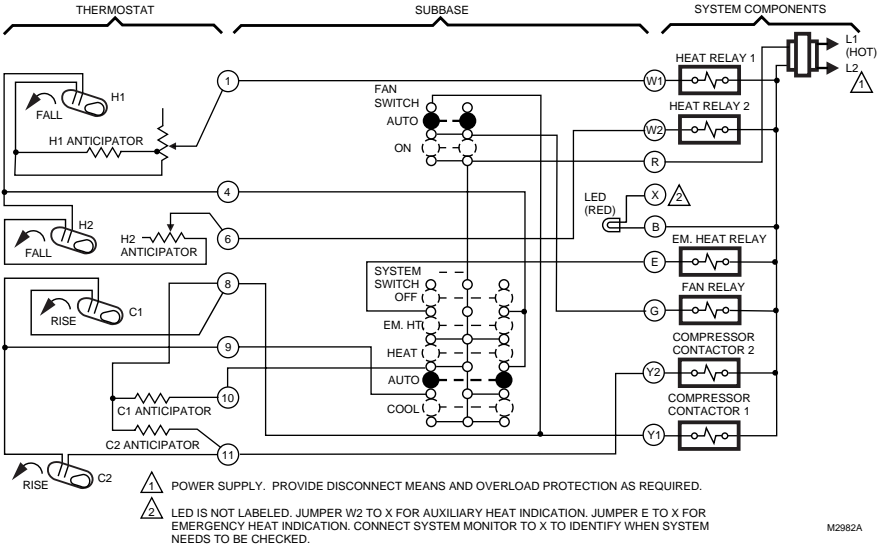
- 1 POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.
- 2 W1 - Y1 JUMPER IS Y TERMINAL; REMOVE JUMPER WHEN W1 RELAY IS USED.

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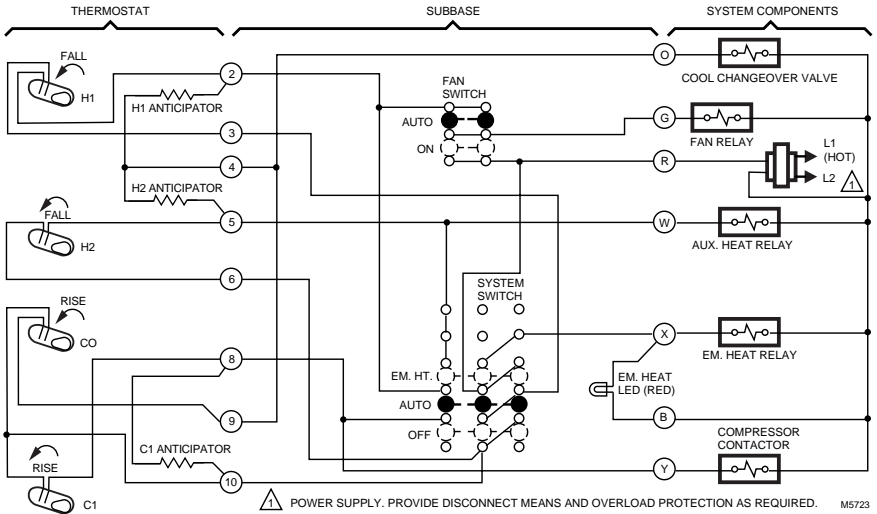
**Fig. 8—Internal schematic and typical wiring diagram for Y594G1526 (T874G1626/Q674F1436); auto changeover in heating.**



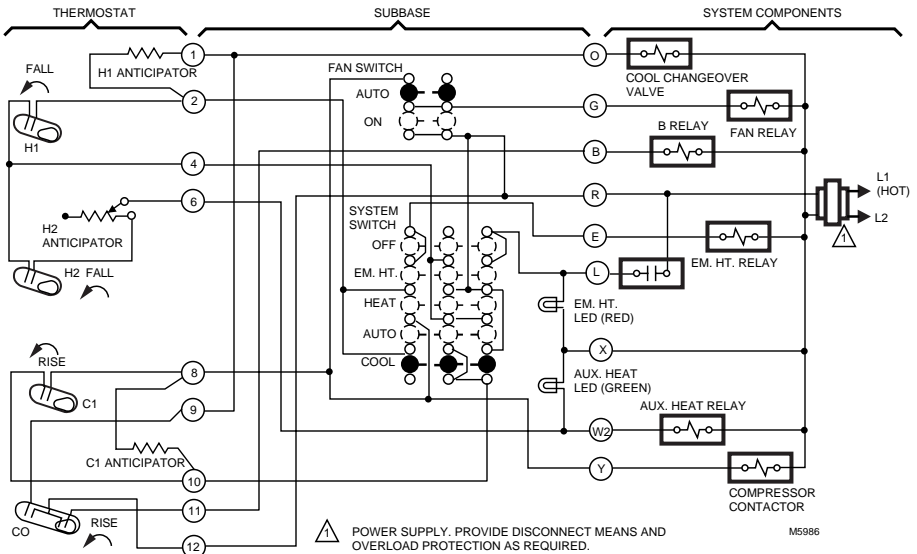
**Fig. 9—Internal schematic and typical wiring diagram for T874D1165, T874E1016/Q674F1543. Exact replacement for York model no. 2TB04700524.**



**Fig. 10—Internal schematic and typical wiring diagram for Y594G1567 (T874G1865/Q674J1209) and Y594G1575 (T874G1873/Q674J1225); auto changeover in cooling. Exact replacement for York model nos. 2TH11702424 and 6TH11702424.**



**Fig. 11—Internal schematic and typical wiring diagram for Y594G1633 (T874G1972/Q674F1584); auto changeover in heating and cooling.**



## MOUNTING THE THERMOSTAT

1. Remove the thermostat cover by pulling the bottom edge of the cover away from the base until it snaps free of the retaining posts.

**NOTE:** The cover is hinged at the top and must be removed by pulling out at the bottom.

2. Carefully remove and discard the foam packing insert that protects the mercury switches during shipment.

3. If thermostat is being used with a Q674 Subbase that has LED indication, and the thermostat set point scale does not have preprinted designations (EM.HT., CHECK, etc.), install the desired preprinted insert packed with the subbase. Push both thermostat set point levers to the far ends of the thermostat. Use index finger to gently pull out the set point scale a fraction of an inch. Insert the desired preprinted insert into the recessed area behind the set point scale. Make sure insert is completely seated in recessed area and reposition set point levers to the desired positions.

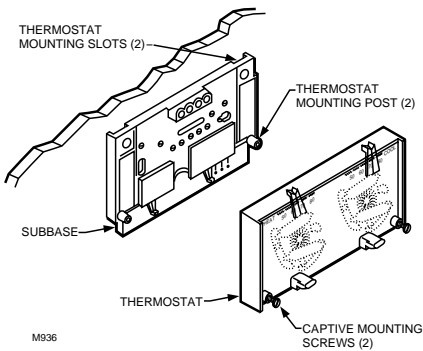
4. Turn over the thermostat base and note the spring fingers that engage the subbase contacts. Make sure the spring fingers are *not* bent flat, preventing proper electrical contact with the subbase.

5. Set any adjustable heat anticipator indicators to the respective current setting of each stage. See Setting the Heat Anticipator section.

6. Note the tabs along the top inside edge of the thermostat base. The tabs fit into the subbase notches. Mount the thermostat base on the subbase and tighten the captive mounting screws. See Fig. 12.

7. Place the upper edge of the thermostat cover on the thermostat base and swing the cover downward until it engages with the retaining posts on the base.

**Fig. 12—Mounting thermostat on subbase.**



## Setting

### SETTING THE HEAT ANTICIPATOR

On models with adjustable anticipation, set each adjustable anticipator to match the primary control current draw. If the primary control nameplate has no rating or if further adjustment is necessary, use the following procedure to determine the current draw for each stage.

The current draw must be measured with the thermostat removed and the power on.

Do not short across primary control terminals. This may burn out the heat anticipator.

1. Connect an ac ammeter of appropriate range between the heating terminals of the subbase as follows:

- Stage 1: between W1 and RH or R.
- Stage 2: between W2 and RH or R.

2. Move the system switch to HEAT or AUTO, and set the temperature to call for heat.

3. After one minute, read the ammeter and record the reading.

4. After mounting the thermostat, set the adjustable heat anticipator to match the readings measured in step 3.

### TEMPERATURE SETTING

Move the heating and the cooling levers to the desired positions. The minimum differential between heating and cooling set points is 4° or 6° F [2° or 3° C], depending on model; the setting levers are designed so they cannot be set closer together than 4° or 6° F [2° or 3° C], depending on the model.

### SUBBASE SETTING



## CAUTION

The Q647F1410 will run the EM. HT. relay constantly when the system is in the EM. HT. position. A cycling stat or limit must be provided external to the T874 to control the EM. HT. relay.

System switching positions control thermostat operation as follows:

OFF: Both the heating and cooling systems are off.

HEAT: Heating system is controlled by the thermostat. Cooling system is off.

COOL: The cooling system is controlled by the thermostat. Heating system is off.

EM.HT.: Emergency heat relay is energized. The cooling system is off. When the heat pump is inoperable, switch to EM. HT. setting. The Q674F1410 Subbase will run EM. HT. relay continuously until the switch position is changed. All other subbases will cycle the EM. HT. relay according to room temperature via the T874 mercury switch.

AUTO: Thermostat automatically changes between heat and cool modes, depending on the indoor temperature.

Fan switching positions control fan operation as follows:

ON: Fan operates continuously.

AUTO: Fan operates with heating or cooling equipment as controlled by the thermostat.

To switch positions, use thumb or index finger to slide the lever to the desired position. Switch lever must stop in detent over the desired function indicator mark for proper circuit operation.



## HEATING

Move the system switch on the Q674 Subbase to HEAT. Move the heating set point lever on the T874 Thermostat about 10° F [6° C] above room temperature. Both stages of heating and fan should start. Move the set point lever about 10° F [6° C] below room temperature. Heating and fan should shut off.

**NOTE:** To prevent compressor short cycling, a minimum off-timer may be included to provide a five-minute time delay before turning on the compressor after the thermostat last turned off the compressor, or after the system first received power. This delay protects the compressor.

## COOLING



## CAUTION

Do not operate cooling if the outdoor temperature is below 50° F [10° C]. Refer to manufacturer recommendations.

Move the system switch on the Q674 Subbase to COOL. Move the cooling set point lever on the T874 Thermostat about 10° F [6° C] below room temperature. Cooling and fan should start (see CAUTION). Move the cooling set point lever about 10° F [6° C] above room temperature. Cooling and fan should stop.

## EMERGENCY HEAT

Change the system switch to EM. HT. The EM. HT. LED will come on. The Q674F1410 Subbase starts the electric strip heater(s) when put in the EM. HT. position (see CAUTION in Subbase Setting section). All other subbases will be tested by moving the set point lever about 10° F [6° C] above room temperature. The electric strip heater(s) will come on. Reset the set point lever about 10° F [6° C] below room temperature. The electric strip heater will de-energize. The EM. HT. LED remains on until the system switch is moved to another position.

## FAN

Move the subbase system switch to OFF, and the fan switch to ON. The fan should run continuously. When the fan switch is in the AUTO position, the fan operates with the heating or cooling equipment.

## THERMOSTAT

T874 Thermostats are accurately calibrated at the factory. *They do not have provision for field calibration.*

## THERMOMETER

1. Remove thermostat cover by pulling the bottom edge of the cover away from the base until it snaps free from the retaining posts.

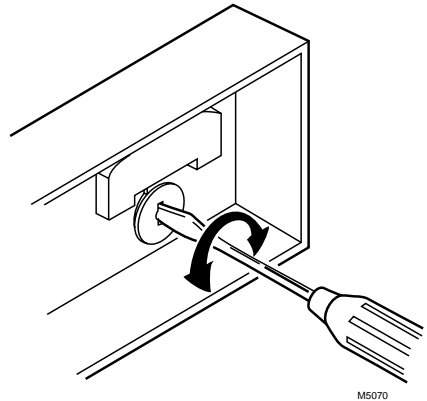
2. Set the cover on a table near an accurate thermometer.

3. After allowing 10 or 15 minutes for stabilization, compare the readings. If they are the same, replace the cover and put the system into operation. If they are different, recalibrate the thermostat thermometer, step 4.

4. Insert a small screwdriver in the thermometer shaft (Fig. 13) and turn it until the thermometers read the same. When the thermometer is calibrated, replace the cover and place the system into operation.

**NOTE:** Hand heat will offset the thermometer reading. After making each adjustment, wait 10 or 15 minutes for the thermometer to stabilize before comparing.

**Fig. 13—Thermometer calibration.**







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