

T874A-F Multistage Thermostats; Q674A-G Subbases by Honeywell

Installation Instructions for the Trained Service Technician

Application

The T874A-F Thermostats provide 24 to 30 Vac control for heating and/or cooling systems as listed in Table 1.

TABLE 1—HEATING AND/OR COOLING STAGES.

T874	A	B	C	D	E	F
Heating Stages	1	1	2	2	—	2
Cooling Stages	1	2	1	2	2	—

The Q674A-G Subbases provide wiring terminals, system and fan switching, and mounting bases for the T874 Thermostats as listed in Table 2.

TABLE 2—SWITCHING POSITIONS.

Q674 Model	Switching Positions	
	System	Fan
A	Heat-Auto-Cool	Auto-On
B	Heat-Off-Cool	Auto-On
C	Off-Auto	Auto-On
D	None	None
E	Off-Heat-Auto-Cool	Auto-On
F	Off-Em. Ht.-Heat-Auto-Cool	Auto-On
G	Off-Auto	None

Operation

For a 2-heat 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.

Most thermostats have a 2° F [1° C] interstage differential so that the 2nd stage makes only when the 1st stage *cannot* handle the load. Some T874D models have interstage differentials that are adjustable from 2° F [1° C] to 12° F [7° C].

The indicators are LEDs (light emitting diodes) on the subbase that light when something specific happens within the system.

Up to four of the LEDs listed below may be included on your subbase. When an LED lights up, refer to this list for the meaning:

FILTER—clogged filter needs replacement.

EM. HT.—emergency heat is operating. The compressor has failed, and the heat pump is not operating. LED lights when system switch is placed in the EM.HT. position by the homeowner.

AUX. HT.—auxiliary heat is operating because the weather is so cold that the heat pump cannot handle the load alone.

CHECK—system needs to be checked. See heating system instructions for specific meaning.

LEDs are not field addable or replaceable.



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 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

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 may result. Push excess wire back into the hole, and plug the hole to prevent drafts from affecting thermostat performance.
4. Do not short across coil terminals on heating relay or gas valve. This may burn out the thermostat heat anticipator.

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 thermostat where it may 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.

MOUNT THE SUBBASE

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

1. To mount on a vertical outlet box, order Honeywell 193121A Adapter Assembly. See Fig. 1. The assembly includes an adapter ring, two screws and a cover plate to cover marks on the wall. Install the ring and cover plate on the vertical outlet box. Horizontal outlet box requires placing subbase on box and tightening two mounting screws.

For a wall installation, hold subbase in position and mark holes for anchors. See Fig. 2. Obtain wall anchors locally. Be careful that the wires do not fall back into the wall opening. Set subbase aside. Drill two 3/16 in. [5 mm] holes and gently tap anchors into the holes until flush with the wall.

2. Pull electrical wires through the cover plate (if used) and subbase cable opening. See Fig. 3. See Wire the Subbase before pulling any wires.

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

Fig. 1—Installation of subbase on outlet box.

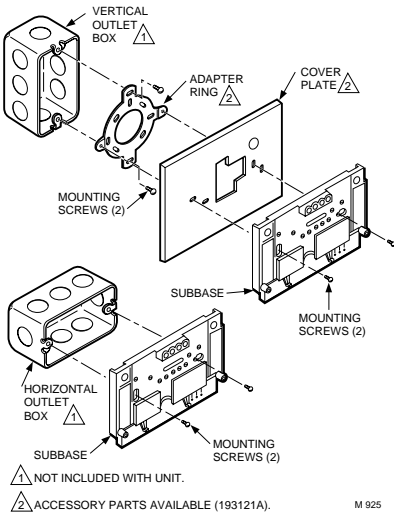


Fig. 2—Installation of subbase on wall.

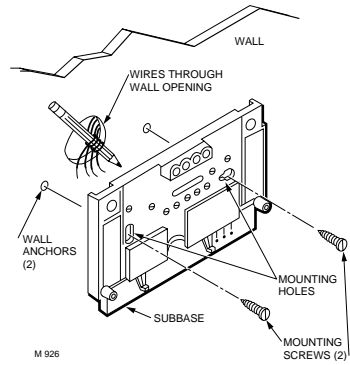
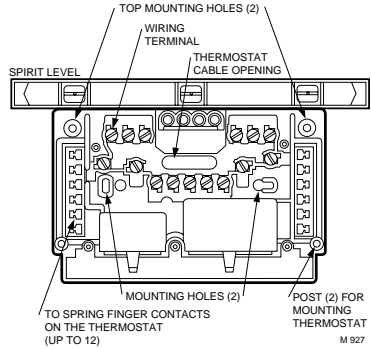


Fig. 3—Subbase components and leveling procedure.



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

4. Level the subbase using a spirit level, see Fig. 3, and firmly tighten subbase mounting screws. The subbase mounting holes allow for minor out-of-level adjustments.

IMPORTANT: An incorrectly leveled subbase will cause the temperature control to deviate from setpoint. It is not a calibration problem.

WIRE THE SUBBASE

Disconnect power supply before beginning installation to prevent electrical shock or equipment damage. All wiring must comply with local electrical codes and ordinances. Follow equipment manufacturer's wiring instructions when available. To wire subbase, proceed as follows:

1. Connect the system wires to the subbase. See Figs. 8 through 17. A letter code for identification is located near each terminal. The terminal barrier permits straight or conventional wraparound wiring connections. See Fig. 4.

2. Your Q674 Subbase may require one or more jumpers that may or may not be factory supplied. Refer to Table 3 to identify the wiring diagrams for specific terminals to be jumpered.

Fig. 4—Wiring connections.

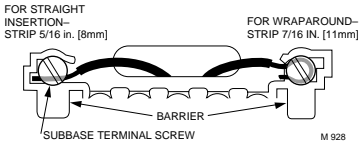


Fig. 5—Jumper RC and RH for single transformer system. Strip wire 3/4 in. [19 mm].

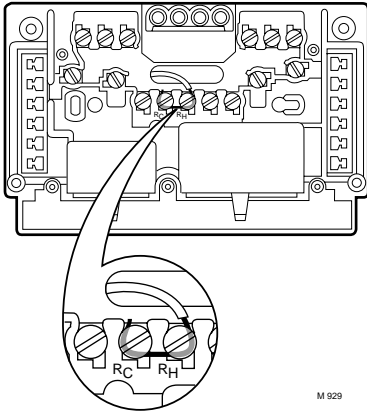
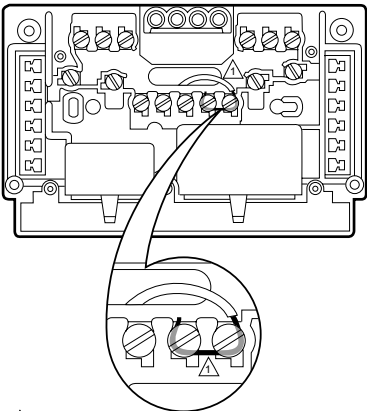


Fig. 6—Jumper adjacent terminals for special system hookup. Strip wire 3/4 in. [19 mm].



⚠ TWO ADJACENT TERMINALS SHOWN JUMPERED ARE FOR EXAMPLE ONLY. COMPARE WIRING DIAGRAM AND SUBBASE TO IDENTIFY TERMINALS TO BE JUMPERED.

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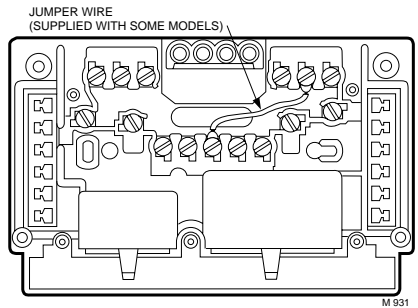
CAUTION

Never install more than one wire per terminal unless factory-supplied jumper with spade terminal is used. See Fig. 7.

TABLE 3—TERMINAL IDENTIFICATION.

If your Subbase has:	Application	Use Fig.
RC, RH terminals	single transformer system	5
adjacent terminals	special system operation or LED indication	6
nonadjacent terminals		7

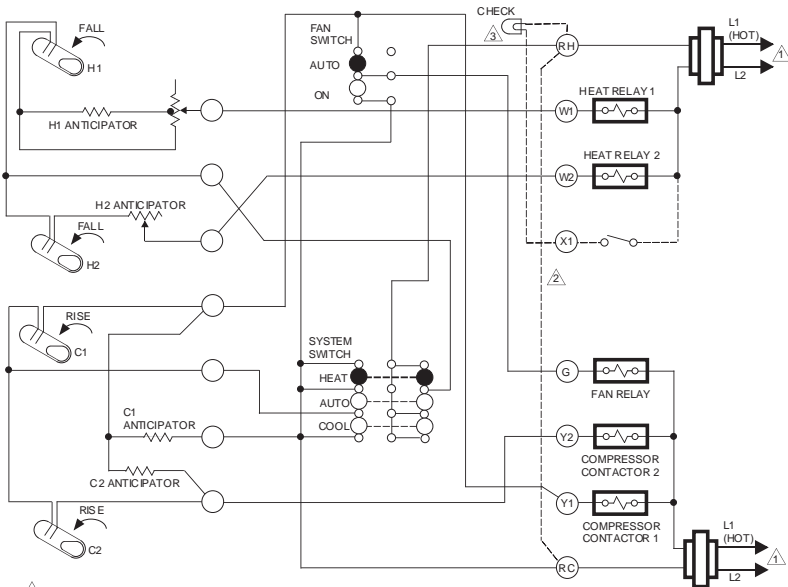
Fig. 7—For nonadjacent terminals, use jumper supplied with subbase.



3. Firmly tighten each terminal screw.
4. Fit wires as close as possible to the subbase. Push excess wire back into hole.
5. Plug hole with nonflammable insulation to prevent drafts from affecting the thermostat.

NOTE: To save space, we have shown only the T874D thermostat with each subbase. (See Figs. 8-16). This thermostat/subbase provides 2-stage heating and 2-stage cooling connections. If you are using another model, refer to Fig. 17.

Fig. 8—T874D/Q674A in standard heating/cooling system.



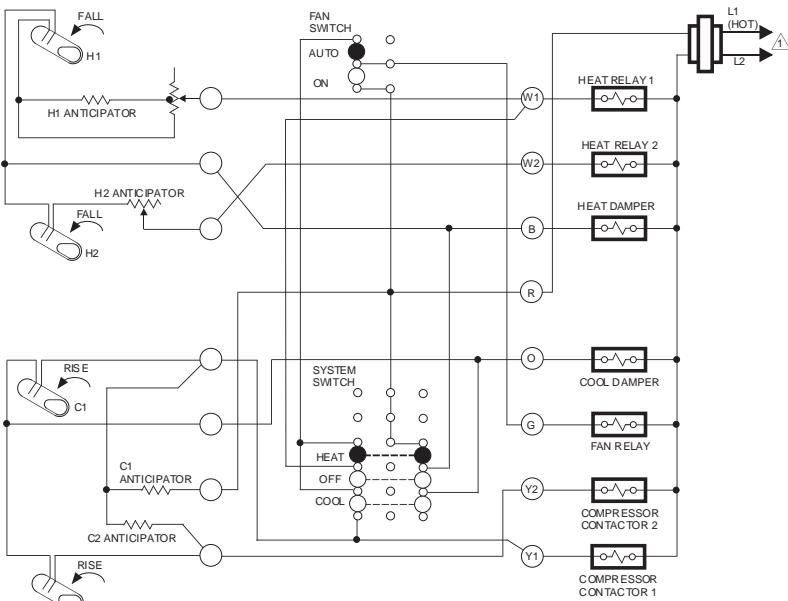
⚠️ POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

⚠️ JUMPER RC, RH FOR SINGLE TRANSFORMER.

⚠️ OPTIONAL CHECK-LITE ON SOME MODELS.

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Fig. 9—T874D/Q674B in standard heating/cooling system with single transformer.



⚠️ POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

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Fig. 10—T874D/Q674B in standard heating/cooling system with RC, RH transformers.

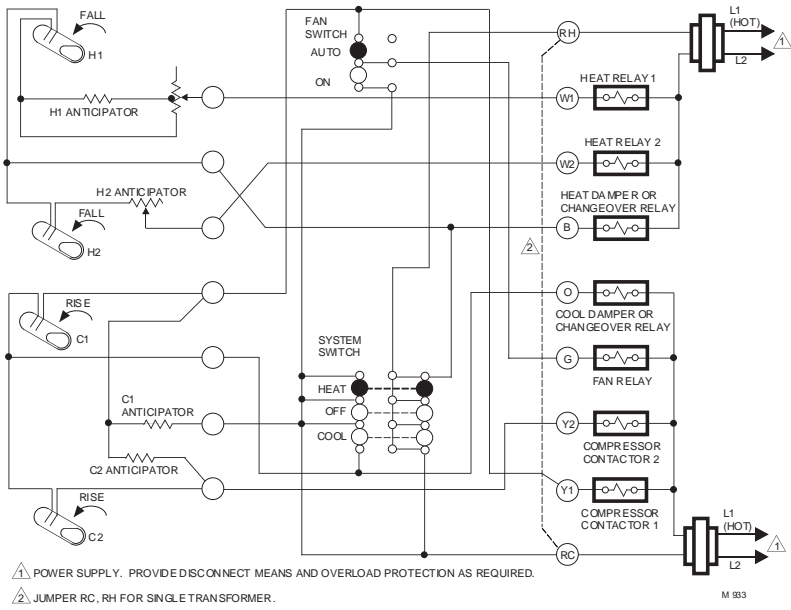


Fig. 11—T874D/Q674B in standard heating/cooling system with RC, RH transformers.

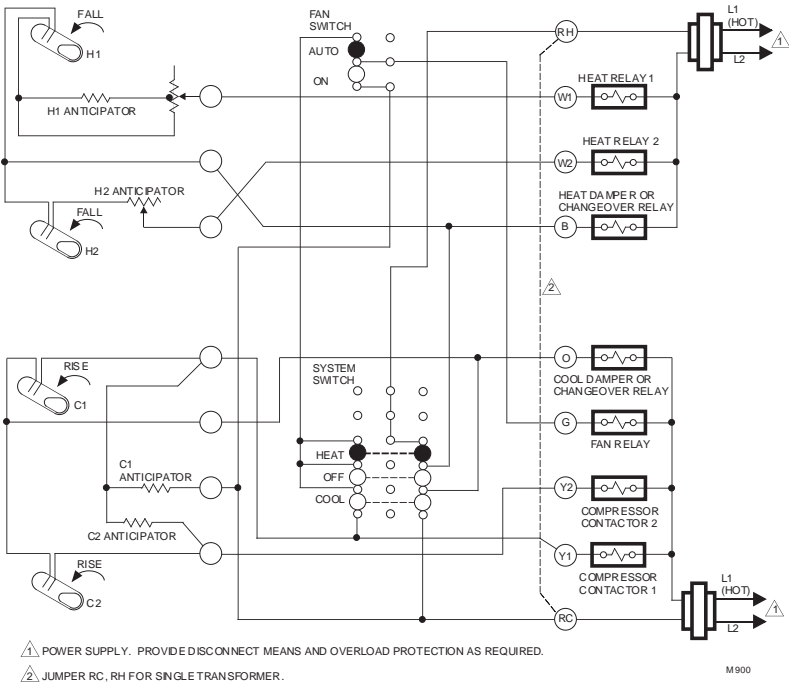


Fig. 12—T874D/Q674C in standard heating/cooling system with RC,RH transformers.

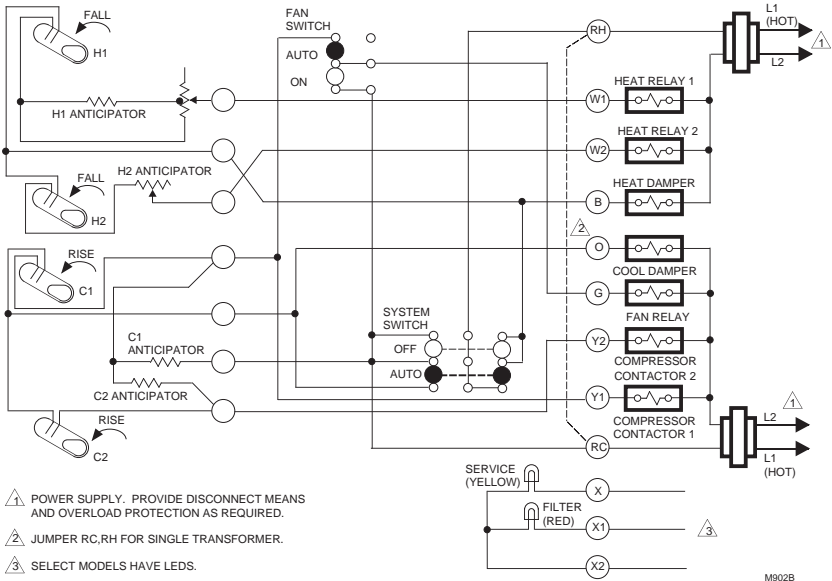


Fig. 13—T874D/Q674D in standard heating/cooling system with RC, RH transformers.

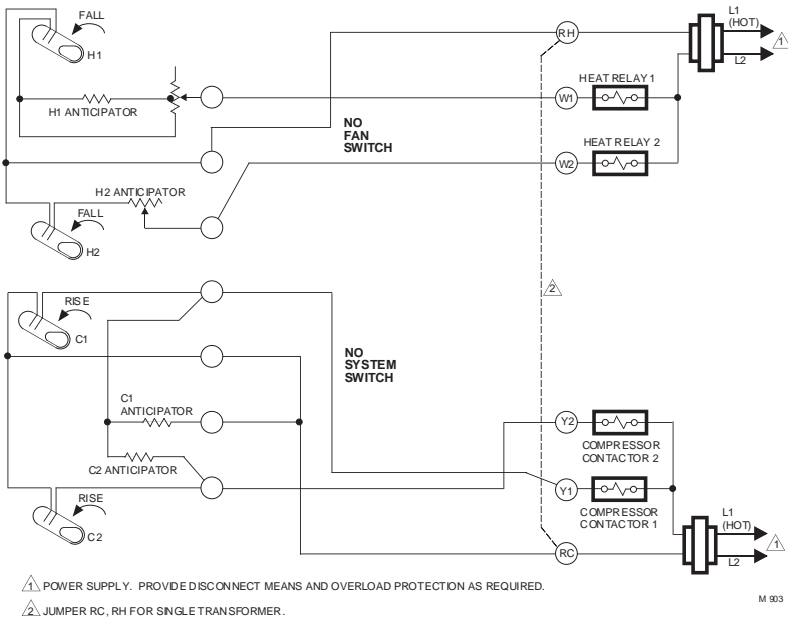


Fig. 14—T874D/Q674E in standard heating/cooling system with RC, RH transformers.

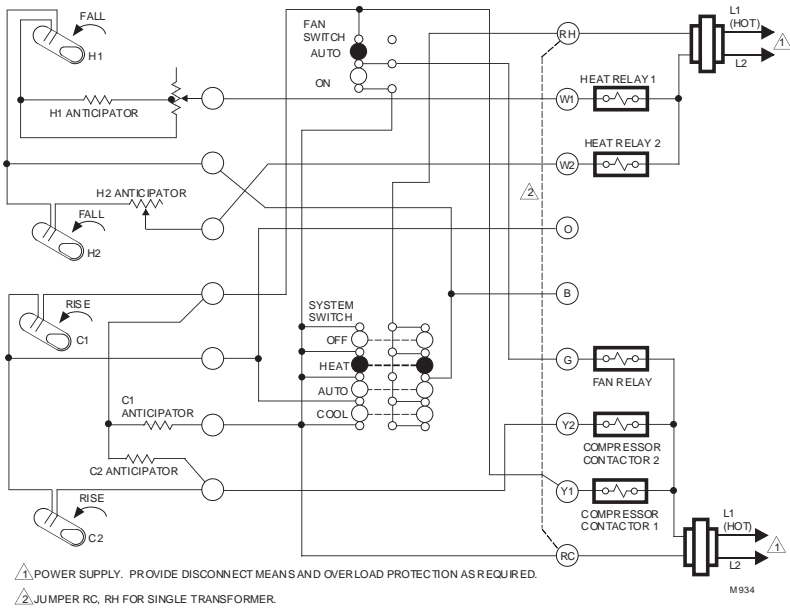


Fig. 15—T874D/Q674F in standard heating/cooling system with RC, RH transformers.

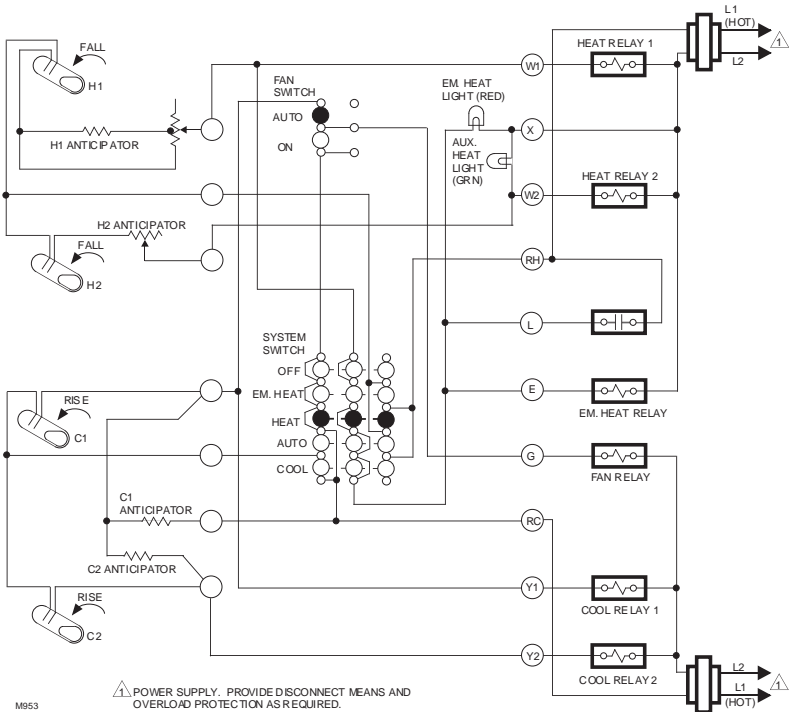


Fig. 16—T874D/Q674G in standard heating/cooling system with RC,RH transformers.

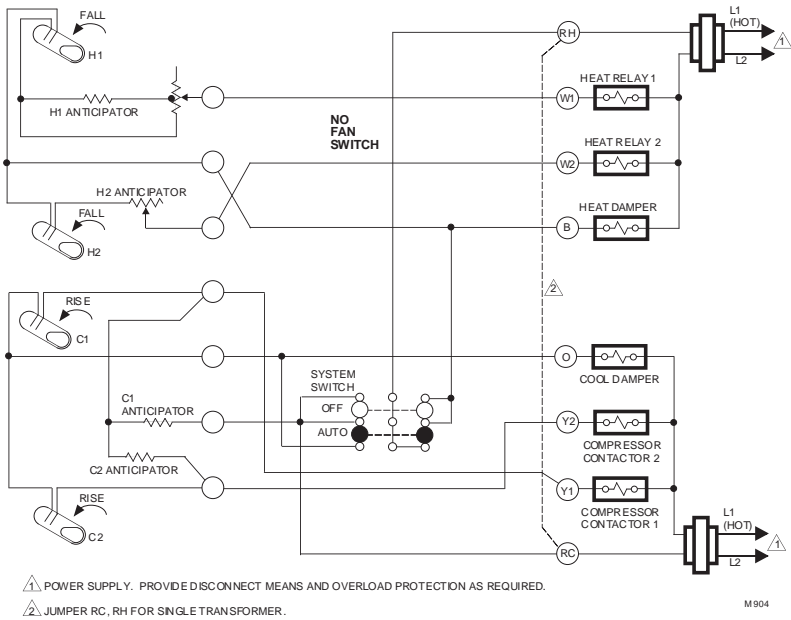
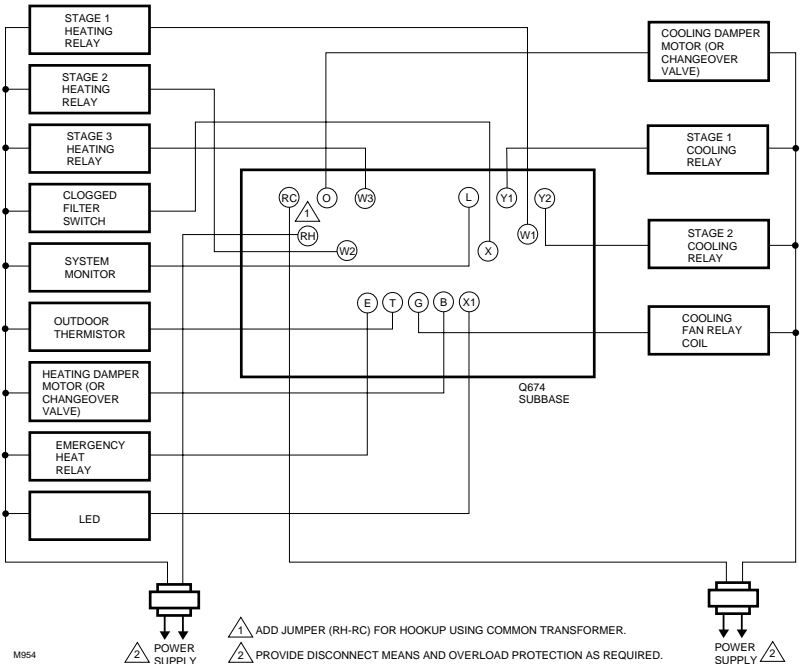


Fig. 17—Typical Q674 terminal designations. Thermostat and subbase used determine number of system components controlled.



TEMPERATURE LEVER STOPS

Some thermostats have factory-installed temperature lever locking screws and/or stop brackets. See Figs. 18 and 19. These are used to restrict the HEAT and COOL temperature setpoint lever ranges. If the components are factory-installed, refer to the specific adjustment procedure.

If a temperature range restriction is required and the locking components are not factory-installed, it will be necessary to order a 4074ECK Envelope Assembly. This envelope includes two stop brackets, one brass insert and one bracket mounting screw for restricting the adjustable range of the HEAT and COOL setpoint levers. Also, the envelope includes two screws with plastic insulated heads for locking in position the setpoint control levers. If the components are to be used, go to the specific installation procedure.

Fig. 18—Location of lever locking screws.

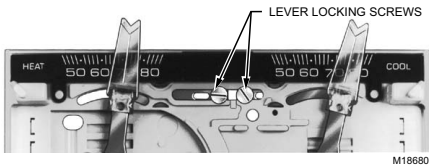
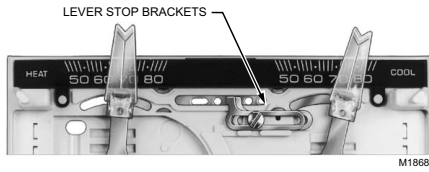


Fig. 19—Locating of lever stop brackets.



INSTALL AND ADJUST LOCKING LEVER SCREWS

The two screws with insulated heads should be used to lock the HEAT and COOL levers at a specific temperature control point. Standard screws that provide metal-to-metal contact with the lever brackets **MUST NOT** be used.

To install:

1. See Fig. 21 for screw hole locations.
2. Install the two screws with insulated heads in the indicated holes. Do not tighten screws.
3. Set the HEAT lever and the COOL lever at desired temperature control point.
4. Firmly tighten both screws.

INSTALL AND ADJUST STOP BRACKETS

Install the stop brackets only if there is a need to restrict the adjustable range of the heating and cooling temperature setpoint levers.

To install:

1. Turn to the back of the T874 Thermostat. Locate the hole for brass insert in the plastic base below the LED space. See Fig. 20.
2. Push brass insert into the hole with your finger.
3. Turn to the front of the T874 Thermostat.
4. Place the two stop brackets in position with the tabs in the slot between the HEAT and COOL levers. See Fig. 21.

Fig. 20—Installing brass insert.

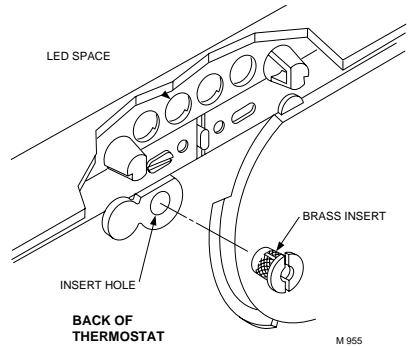
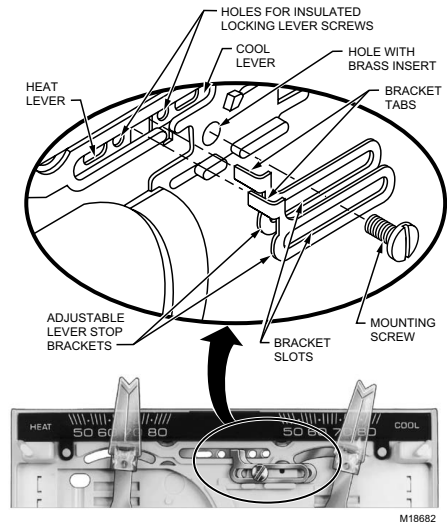


Fig. 21—Installing the stop brackets.



5. Insert the mounting screw into the two slots in the stop brackets and attach to the brass insert. Tighten the screw to pull the brass insert into the back of the thermostat.
6. Loosen the mounting screw enough to slide the stop brackets for adjustment.
7. Move the HEAT and COOL setpoint levers to the desired range limits.
8. Slide the stop brackets until one rests against the HEAT lever and the other rests against the COOL lever.
9. Firmly tighten the mounting screw.

MOUNT THERMOSTAT

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

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

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

3. 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.

4. Set the heat anticipator indicators to the respective current setting for each stage. See Set Heat Anticipator section.

5. Note the two tabs on the top inside edge of the thermostat base. The tabs fit into corresponding slots on top of the subbase. Mount the thermostat on the subbase.

6. Align the two captive mounting screws in the thermostat base with the posts on the subbase. See Fig. 22. Tighten both screws. *Do not overtighten screws* or damage to subbase posts can result.

7. If the thermostat provides optional locking cover assembly, start the Allen locking screws for the cover with the wrench provided. See Fig. 23.

8. Note the tabs along the top inside edge of the thermostat base. The tabs fit the subbase notches. Hang the thermostat on the subbase and tighten the captive mounting screws on the thermostat base. See Figs. 1 and 2. *Do not overtighten* thermostat captive mounting screws. This may damage the threads in the subbase.

9. Hang the upper edge of the thermostat cover on the base and swing cover downward until it engages with cover clip on base. Tighten the locking cover screw, if assembly is provided.

Fig. 22—Mounting thermostat on subbase.

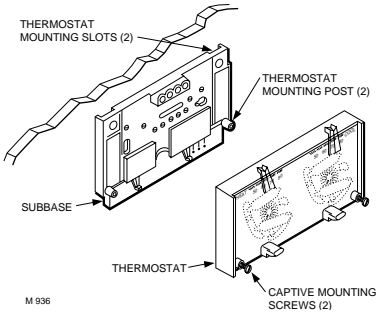
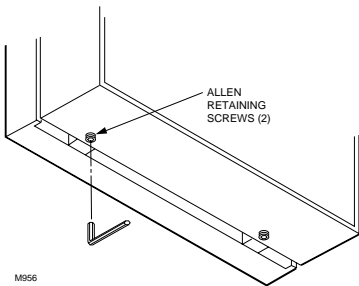


Fig. 23—Installation of locking cover assembly.



SET HEAT ANTICIPATOR

Move the indicator to match the current rating of primary control. See Fig. 24. When using the T874 Thermostat with two stages of heating, set each heat anticipator to match its respective primary control current draw. If you cannot find the current rating on the primary control, or if further adjustment is necessary, see NOTE below and use the following procedure to determine the current draw of each stage.

The current draw must be measured with the thermostat removed from the subbase and power on to the heating system.

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

Stage 1: between W1 and RH or R.

Stage 2: between W2 and RH or R.

2. Move the system switch to AUTO or HEAT (if used).

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

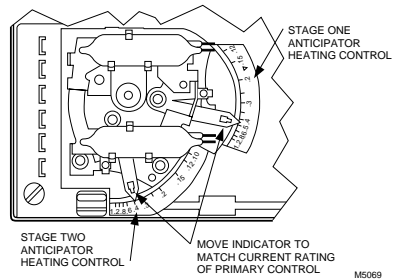
Stage 1: _____ amperes.

Stage 2: _____ amperes.

NOTE: If equipment cycles too fast, set the indicator to a higher current rating, not more than one-half division at a time, and recheck cycle rate. Most conventional two-stage heating equipment is designed to operate at three cycles per hour per stage, and one-stage heating equipment at six cycles per hour, at 50 percent load condition. When using the T874 Thermostat in heat pump systems, set the heat anticipator at 140 percent of the actual primary control current draw to reduce the cycling rate. Most heat pump systems should cycle 2-1/2 to 3 times per hour.

4. Hang the upper edge of the thermostat cover on top of the thermostat base and swing cover downward until it engages with cover clip.

Fig. 24—Adjustable heat anticipator scales.



SET ADJUSTABLE DIFFERENTIAL

The adjustable interstage differential feature, on only a selected T874D model, can be identified by the scale and tension screw near the heating and cooling mercury switches. See Fig. 25. The number of degrees is adjustable between the making of the first and second stage mercury bulbs. This feature is especially useful if the first stage controls the comfort temperature, and the second stage controls the energy savings temperature.

Each mark of the scale represents 1° F [0.6° C]. The differential is factory-set at 2° F [1° C]; the differential may be set as high as 12° F [7° C]. To set the adjustable interstage differential, loosen the tension screw. See Fig. 25. Slide the adjustable scale to align with the number of degrees between stages desired. Use the lower edge of the tension screw bracket as a guide for alignment. In heating, slide the lever *wider* apart for a *larger* differential, or *closer* together for a *smaller* differential. In cooling, slide the lever *closer* together for a *larger* differential, or *wider* apart for a *smaller* differential.

IMPORTANT: Support the scale with your hand while tightening the tension screw. See Fig. 25. Failure to do so may result in twisting and damaging the bimetal coil.

CAUTION

When the thermostat is used to control a two-stage heating or cooling system, the second stage mercury bulb must never make before the first stage bulb, or severe equipment damage could result. To prevent this problem, provide at least 2° F [1° C] differential between stage 1 and stage 2 make points. Example: in heating, if stage 1 makes at 70° F [21° C], stage 2 should make a 68° F [20° C] or higher.

VERIFY THE ADJUSTMENT

Heating

Start with the heating setpoint lever all the way to the left. Slowly move the lever to the right, just until the first stage bulb makes (mercury rolls to the right side of the bulb). Note the setting on the temperature scale. Slowly move the lever to the right a little more, just until the second stage bulb makes. Note the setting on the temperature scale. The difference between the two temperatures is the interstage differential, which should match the number set on the scale with the tension screw.

Cooling

Start with the cooling setpoint lever all the way to the right. Slowly move the lever to the left, just until the first stage bulb makes (mercury rolls to the left side of the bulb). Note the setting on the temperature scale. Slowly move the lever to the left a little more, just until the second stage bulb makes. Note the setting on the temperature scale. The difference between the two temperatures is the interstage differential, which should match the number set on the scale with the tension screw.

TEMPERATURE SETTING

Move the heating and cooling setpoint levers to the desired comfort positions. See Fig. 26. One lever controls all stages of heating, and another lever controls all stages of cooling. The minimum differential between heating and cooling setpoints is 3° F [2° C].

SUBBASE SETTING

The subbase switches control system operation as described below. See Fig. 26.

SYSTEM SWITCH (some subbases do not have all of the following functions):

Fig. 25—Set adjustable interstage differential.

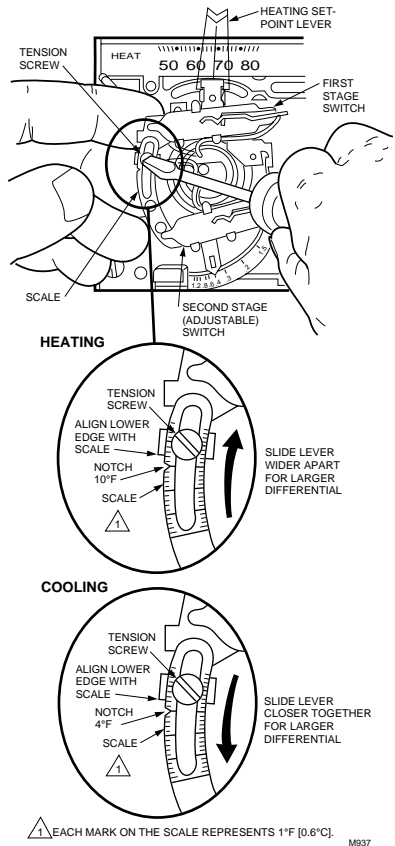
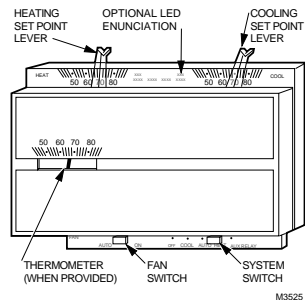


Fig. 26—Location of external components.



OFF—both the heating and cooling systems are off. If the fan switch is at AUTO position, the cooling fan is also off.

AUTO—thermostat automatically changes between heating and cooling system operation, depending on the indoor temperature.

HEAT—heating system is automatically controlled by the thermostat. Cooling system is off.

COOL—cooling system is automatically controlled by the thermostat. Heating system is off.

FAN SWITCH

ON—fan operates continuously.

AUTO—fan operates with cooling equipment as controlled by the thermostat or with the heating equipment as controlled by the plenum switch.

To move the subbase switches to the desired control positions, use thumb and index finger to slide lever. Lever must stop over desired function indicator position for proper circuit operation.

Checkout

HEATING

Move the system switch on the subbase to **AUTO** or **HEAT** (if used) and the fan switch to **AUTO**. Move the heating setpoint lever on the thermostat about 10° F [6° C] above room temperature. Heating equipment should start and the fan should run. On standard systems, the fan will start after a short delay. Move the heat lever about 10° F [6° C] below room temperature. The heating equipment should shut off. On standard systems, the fan should run for a short time until plenum switch cools to its setpoint. On heat pump systems, the fan will shut off with heating equipment.

NOTE: In heat pump applications, a minimum off-timer provides a five-minute time delay before starting compressor when the thermostat last turned off the compressor, or when the system first received power. This delay prevents compressor short cycling.

COOLING



CAUTION

If outside air or heat exchange medium (water) is below 50° F [10° C], do not operate cooling.

Move the system switch on the subbase to **AUTO** or **COOL** (if used) and the fan switch to **AUTO**. Move the cooling setpoint lever on the thermostat about 10° F [6° C] below room temperature. The cooling equipment should start (see **NOTE** above). Move the cool lever about 10° F [6° C] above room temperature. The cooling equipment and fan should shut off.

FAN

Move the subbase system switch to **OFF**, and the fan switch to **ON**. The fan should run continuously. Move the

fan switch to **AUTO**. On heat pump systems, fan operation is controlled by the heating or cooling system control circuit. On standard systems, fan operation is controlled by the plenum fan control in heating and by the thermostat in cooling.

Calibration

THERMOSTAT

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

THERMOMETER

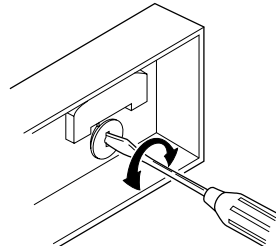
The thermometer in your thermostat has been accurately calibrated at the factory. The thermometer should need adjustment only if it has been dropped or mishandled.

If the setpoint lever and the thermometer reading do not agree, follow this procedure:

1. Remove the thermostat cover by pulling up from the bottom of cover until it clears the mounting slots.
2. Set the thermostat cover on a table near an accurate thermometer.
3. Allow five minutes for cover thermometer to sense area temperature; compare the readings. Be careful not to touch thermometer or breathe on it.
4. If the readings are the same, replace cover and pull the system into operation.
5. If the readings are different, insert a small screwdriver in the thermometer slot and turn in until the thermometers have the same reading. See Fig. 27.
6. Replace thermostat cover and put system into operation.

NOTE: Radiant heat from your hands will offset the thermometer reading. After making each adjustment, wait five or ten minutes for the thermometer to stabilize before comparing.

Fig. 27—Thermometer calibration.



Home and Building Control

Honeywell Inc.
1985 Douglas Drive North
Golden Valley, Minnesota 55422

Home and Building Control

Honeywell Limited—Honeywell Limitée
740 Ellesmere Road
Scarborough, Ontario
M1P 2V9

Helping You Control Your World

