T874A,D,R Thermostats and Q674B,D,F,Q Subbases

INSTALLATION INSTRUCTIONS

APPLICATION

These thermostat/subbase combinations provide low voltage (24 Vac) control in multistage systems as follows:

Thermostat/ Subbase	Number of Stages		Switching Positions		Wiring Fig.
	Heat	Cool	System	Fan	
T874A/Q674Q	1	1	HEAT-OFF-COOL	LO-MED-HIGH-ON	4
T874D/Q674F	2	2	AUX HT-HEAT PUMP-2 STG. HEAT-OFF-COOL	AUTO-ON	5
T874R/Q674B	2	1	HEAT-OFF-COOL	AUTO-ON	6,7
T874D/Q674D	2	2	None	None	8
T874D/Q674B	2	2	HEAT-OFF-COOL	AUTO-ON	9

OPERATION

On a two-stage 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.

There are about 2°F (1°C) between stages so that the second stage *makes* only when the first stage cannot handle the load. This is called 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 this list for the meaning:

AUX. HEAT: Auxiliary heat is operating, which means the weather is so cold that the heat pump alone cannot handle the load.

HEAT PUMP: System needs to be checked. See heating system instructions for specific meaning.

LEDs are not field replaceable.

RECYCLING NOTICE

This control contains mercury in a sealed tube. Do *not* place the 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. Run wires as close as possible to the subbase. To prevent interference with the thermostat linkage, keep wire length to a minimum. Push excess wire back into the hole, and plug the hole to prevent drafts from affecting the thermostat operation.
3. Do not overtighten the thermostat captive mounting screws because damage to the subbase threads can result.
4. Do not short across coil terminals on the relay. This can burn out the heat indicator.

IMPORTANT

An incorrectly leveled thermostat can cause the temperature control to deviate from setpoint. It is not a calibration problem.

Location

Install the thermostat about 5 ft (1.5m) above the floor in a well-circulated area of 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.

Mount Subbase

The subbase can be mounted on a vertical or horizontal outlet box (see Fig. 1) or directly on the wall (see Fig. 2).

To mount the subbase on a vertical outlet box, order 193121A Adapter Assembly, which includes an adapter ring, two screws and a cover plate to cover marks on the wall.

IMPORTANT

An incorrectly leveled subbase can cause the temperature control to deviate from setpoint.

To mount the subbase on the wall:

❶ Hold the subbase in position and mark the holes for the anchors. Wall anchors must be obtained locally. Make sure that the wires do not fall back into the wall opening.
❷ Set aside the subbase.
❸ Drill four 3/16 in. (4.6 mm) holes and gently tap the anchors into the holes until flush with the wall.
❹ Pull electrical wires through the cover plate, if used, and through the subbase wire opening. See Fig. 2. Secure the cover plate and subbase with the two screws provided, but do not fully tighten the screws.
❺ The subbase mounting slots allow minor out-of-level adjustments. Level the subbase using a spirit level, as shown in Fig. 3, and tighten the subbase mounting screws.

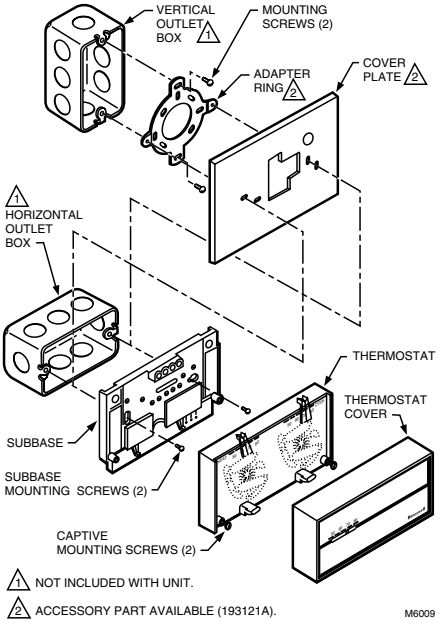

Fig. 1. Installation of Q674 Subbase on outlet box.

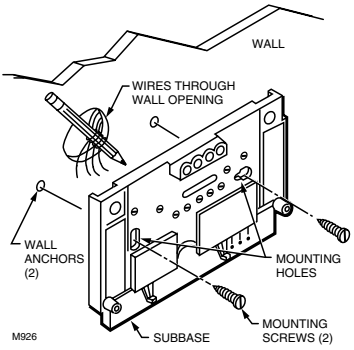

Fig. 2. Installation of Q674 Subbase on wall.

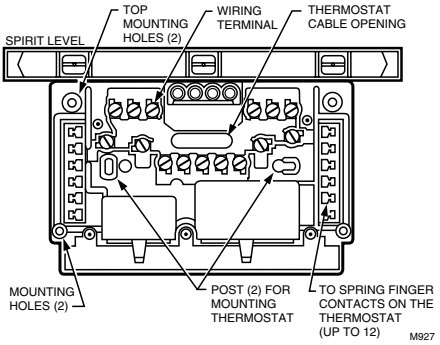

Fig. 3. Level the subbase.

Wire Subbase

IMPORTANT

Use 18-gauge, color-coded thermostat wire for wiring the Q674 Subbase.

Disconnect power supply to prevent electrical shock or equipment damage. All wiring must comply with local electrical codes and ordinances. Follow equipment manufacturer wiring instructions when available.

1. Connect the system wires to the subbase as shown in Fig. 4 through 9. A letter code is located near each terminal for identification. The terminal barrier allows straight or conventional wraparound wiring connections. Either method is acceptable. See Fig. 10.
2. Run wires as close as possible to the subbase, keeping wire length to a minimum.
3. Push excess wire back into the hole.
4. Plug the hole to prevent drafts.

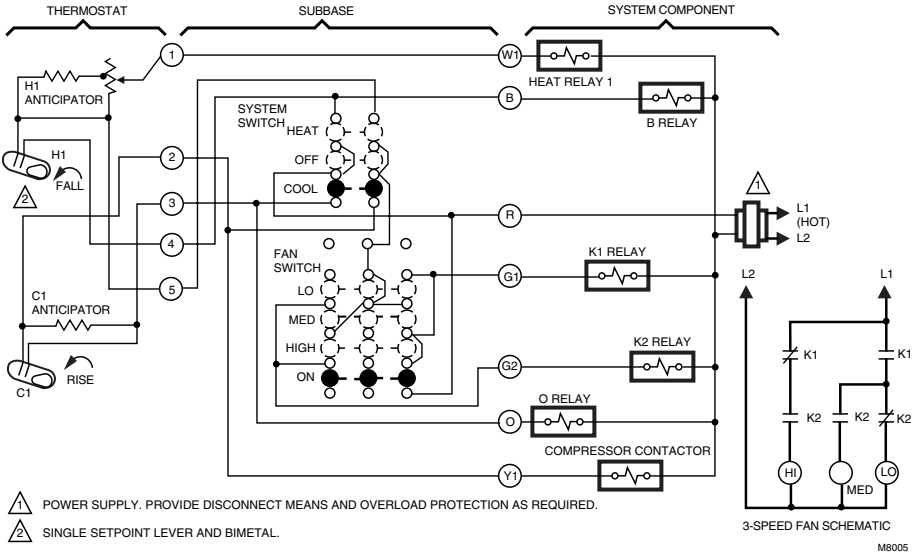

Fig. 4. Internal schematic and typical hookup of T874A Thermostat with Q674Q Subbase with automatic changeover.

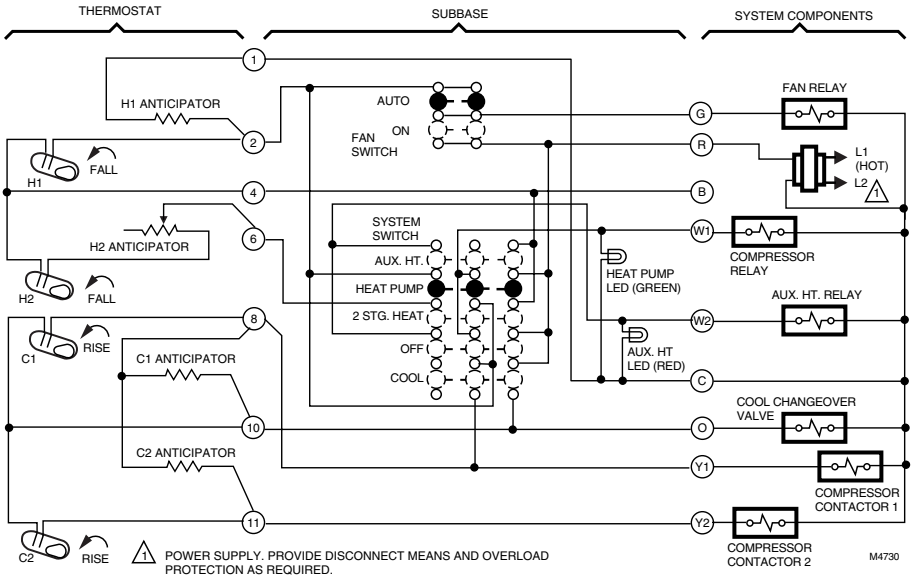

Fig. 5. Internal schematic and typical hookup of T874D Thermostat with Q674F Subbase with manual changeover.

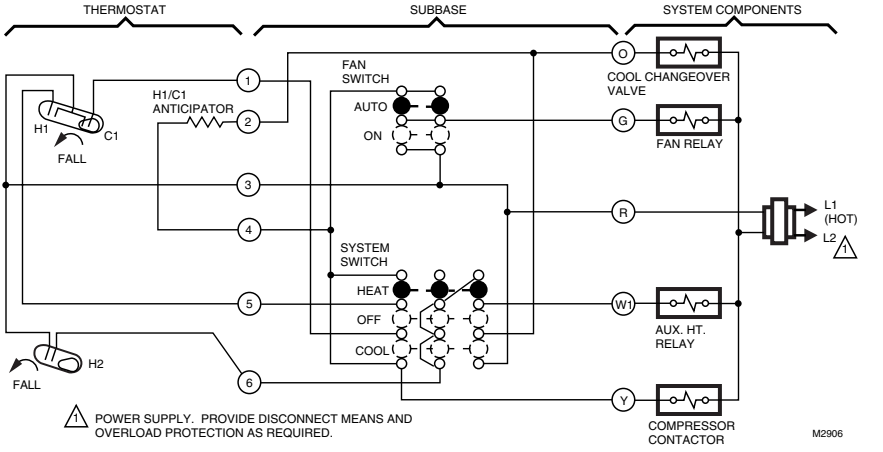

Fig. 6. Internal schematic and typical hookup of T874R Thermostat with Q674B Subbase in heat pump system with changeover in cooling.

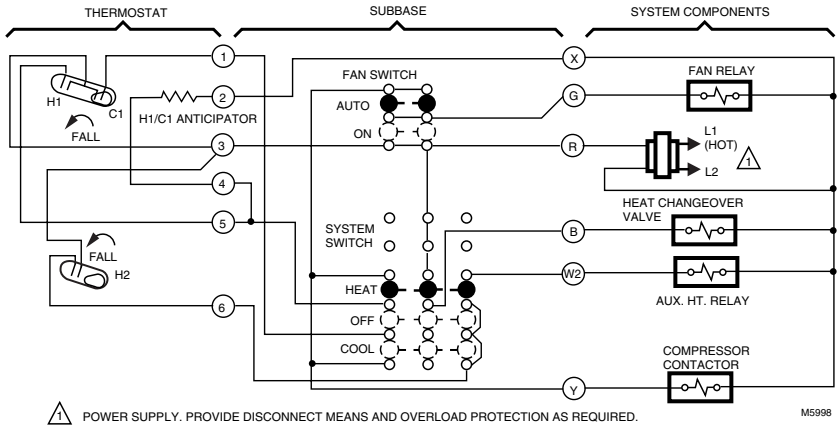

Fig. 7. Internal schematic and typical hookup of T874R Thermostat with Q674B Subbase in heat pump system with changeover in heating.

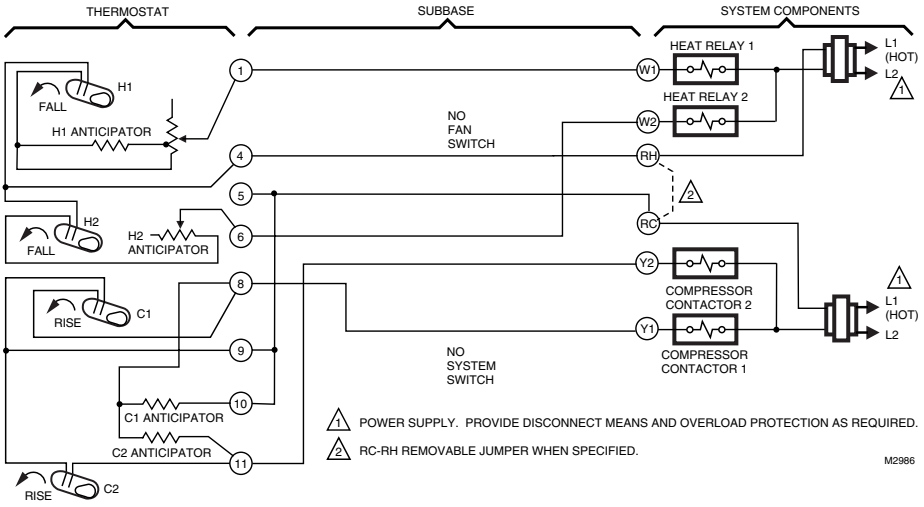

Fig. 8. Internal schematic and typical hookup of T874D Thermostat with Q674D Subbase with automatic changeover.

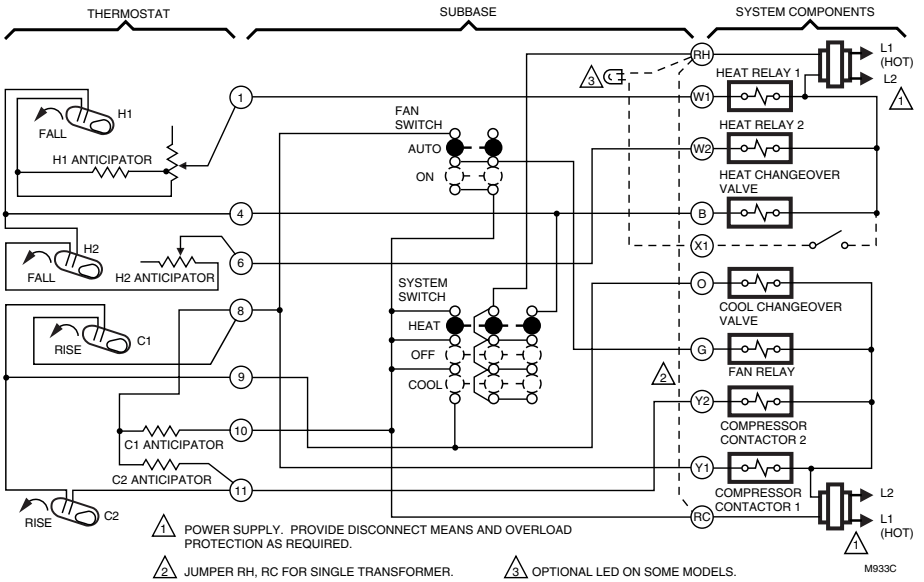

Fig. 9. Internal schematic and typical hookup of T874D Thermostat with Q674B Subbase in heat pump system with changeover in heating and cooling.

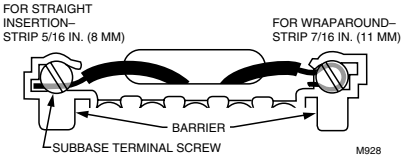

Fig. 10. Wiring connections.

Mounting the Thermostat

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

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

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

   NOTE: If the thermostat is being used with a Q674 Subbase with LEDs and the thermostat setpoint scale is not labeled (such as EM. HT., CHECK), install the desired LED label insert (packed with the subbase):
   - Push both thermostat setpoint levers to the far ends of the thermostat.
   - Gently pull the setpoint scale out about 1/4 in. (6 mm).
   - Insert the desired LED label.
   - Reposition the setpoint levers.

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, which prevents proper electrical contact with the subbase.
4. Set the heat anticipator indicators at the respective current setting for each stage. See Setting the Heat Anticipator section.
5. Mount the thermostat base on the subbase noting the tabs along the top inside edge of the thermostat base. The tabs fit into the subbase notches.
6. Tighten the captive mounting screws. See Fig. 1.
7. Place the upper edge of the thermostat cover on the thermostat base and swing the cover downward until it engages with the cover clip on the base.

SETTINGS

Setting the Heat Anticipator

Set the heat anticipator to match the current draw of the primary control. If the primary control nameplate is not labeled with a rating, or if further adjustment is necessary, use the following procedure to determine the current draw for each stage. Measure the current draw of each heating stage with the thermostat removed from the subbase and the power on:

1. Connect an ac ammeter of appropriate range between the heating terminals of the subbase:
   Stage 1: between W1 and R.
   Stage 2: between W2 and R.
2. Move the system switch to HEAT or AUTO.
3. After one minute, read the ammeter and record the reading.

❹ After mounting the thermostat, set the adjustable heat anticipator(s) to match the respective reading(s) recorded in step ❸. See Fig. 11.

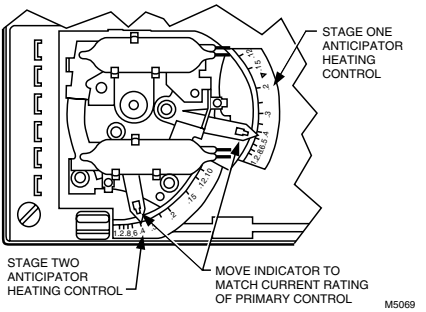

Fig. 11. Adjustable heat anticipator scales.

Temperature Setting

❶ Move the heating and cooling levers to the desired positions. The minimum differential between the heating and the cooling setpoints is 3°F (2°C), which means the setting levers are designed so they cannot be set closer together than 3°F (2°C).

NOTE: If adjustable lever stops are desired, order 4074ECK Bag Assembly, which contains a brass insert, mounting screw, and two adjustable stops.

❷ Gently push the brass insert into the backside of the T874 in the hole below the LED space.
❸ Place the two stops on the face of the T874 in the space below the LED.
❹ Insert the mounting screw through the two stops, and into the threaded hole of the brass insert. The mounting screw pulls the brass insert up through the back of the plastic base.
❺ Loosen the screw so the stops can slide into the desired position against the levers.
❻ Tighten the screw. See Fig. 12.

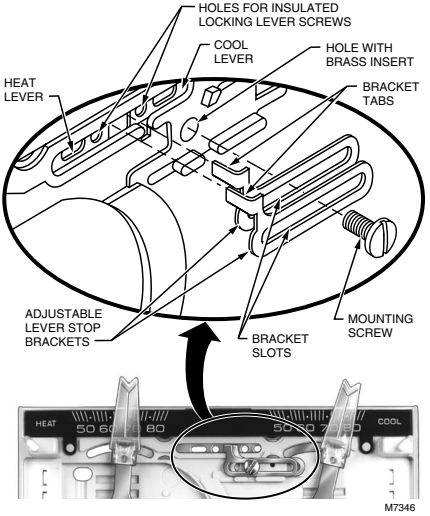

Fig. 12. Installing adjustable lever stops.

Subbase Setting

System switch settings control thermostat operation as follows:

OFF: Heating and cooling systems are off. If the fan switch is in the AUTO position, the cooling fan is also off.
HEAT: Heating system is controlled by the thermostat. Cooling system is off.
COOL: Thermostat controls the cooling system. Heating system is off.
AUX. HEAT: Auxiliary heat is on. Cooling system is off.
HEAT PUMP: Both first and second stage heat are on. Cooling system is off.
2 STG. HEAT: Second stage heat is on. Cooling system is off.

Fan switch settings control fan operation as follows:

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.

LO: Fan operates at a low speed when heating or cooling equipment cycles on.

MED: Fan operates at a medium speed when heating or cooling equipment cycles on.

HIGH: Fan operates at a high speed when heating or cooling equipment cycles on.

To switch settings, slide the lever to the desired position. For proper circuit operation, set the switch lever in the indent directly over the desired switch setting.

CHECKOUT

Heating

1. Move the system switch on the Q674 Subbase to HEAT or AUTO, and the fan switch to AUTO (if applicable).
2. Move the heating lever on the T874 about 10°F (6°C) above the room temperature. Both stages of heating and fan should start if there is no time delay or outdoor temperature limiting system.
3. Move the heating lever about 10°F (6°C) below the room temperature. The heating equipment and fan should shut off.

Cooling

CAUTION

Do not operate the cooling equipment if the outdoor temperature is below 50°F (10°C). Damage to the compressor can result.

1. Move the system switch on the Q674 Subbase to COOL or AUTO.
2. Move the cooling lever on the T874 Thermostat about 10°F (6°C) below the room temperature. The cooling equipment and fan should start.
3. Move the cooling lever about 10°F (6°C) above the room temperature. The cooling equipment and fan should stop.

Fan

1. Move the subbase system switch to OFF or AUTO.
2. Move the fan switch to ON. The fan should run continuously. When the fan switch is in the AUTO position, fan operation is controlled by the heating or cooling system.

CALIBRATION

Thermostat

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

THERMOMETER

1. Remove the thermostat cover by pulling up from the bottom of the cover until it clears the cover clip.
2. Set the cover on a table near an accurate thermometer.
3. After allowing five or ten minutes for stabilization, compare the readings. If the readings are the same, replace the cover and put the system into operation. If the readings vary, recalibrate the thermostat thermometer; see step 4.
4. Insert a small screwdriver in the thermometer shaft and turn it until the thermometers read the same. See Fig. 13. When the thermometer is calibrated, replace the cover and place the system into operation.

NOTE: Hand heat offsets the thermometer reading. After making each adjustment, wait five or ten minutes for the thermometer to stabilize before comparing the readings.

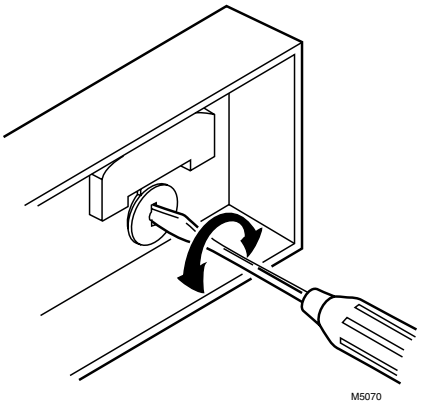

Fig. 13. Thermometer calibration.

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