

T87F Universal Thermostat

INSTALLATION INSTRUCTIONS

APPLICATION

The T87F Universal Thermostat provides temperature control for 24 to 30 Vac residential heating, cooling or heating/cooling systems. For heating systems, the T87F mounts on the wallplate provided. For cooling only, or heating/cooling, order the 137421A (198170A for textured designer model) Heating-Cooling Wallplate with remote switching, or the Q539 Subbase that provides switching at the thermostat location.

The spdt switch makes one set of contacts on a temperature fall to operate the heating system. The other set of contacts makes on a temperature rise to operate the cooling system when the T87F is used to control cooling.

Models with positive Off feature break the electrical circuit to prevent system operation when the switch is moved to the Off position. These models use the 137421B Wallplate for cooling or heating/cooling systems.

Heat anticipation is adjustable, 0.1 to 1.2A.



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.

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 AND SETTING

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.

IMPORTANT

The T87F was carefully adjusted at the factory. Handle the thermostat carefully; rough handling can decrease its accuracy.



CAUTION

Electrical Hazard.

Electrical shock can cause personal injury or equipment damage.

Disconnect power supply before beginning installation.



CAUTION

Equipment Damage Hazard.

Causing terminal shorts can burn out heat anticipator.

Do not short across relay coil terminals.

Location

Select a location about 1.5m (5 ft) above the floor in an area with good air circulation at average temperature.

- Do not mount 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 behind the thermostat.

Mounting subbase wallplate (Fig. 2)

IMPORTANT

1. Use spirit level to accurately level the wallplate or subbase; see Fig. 1. Inaccurate leveling can cause thermostat control deviation.
 2. When using the T87F with a Q539 Subbase, follow the mounting and wiring instructions included with the subbase.
1. Place wallplate on wall at desired location. Pull thermostat cable through entrance hole.
 2. Fasten wallplate but do not tighten screws.



3. Level according to Fig. 1; then tighten screws.
4. After wiring wallplate, plug hole to prevent drafts from affecting thermostat.

NOTE: To mount T87 Thermostat on an outlet box, order 129044A Adapter Ring Assembly.

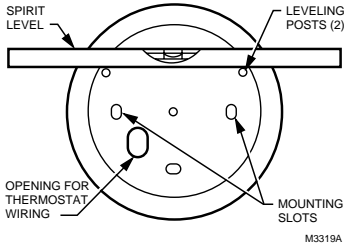


Fig. 1. Leveling wallplate or subbase with spirit level.

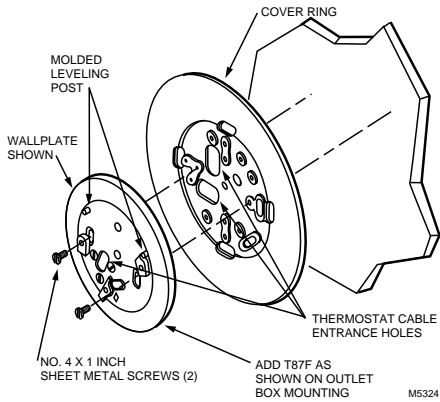


Fig. 2. Mounting wallplate or subbase to wall.

WIRING

All wiring must comply with local electrical codes and ordinances.

CAUTION

Electrical Hazard.
Electrical shock can cause personal injury or equipment damage.
 Disconnect power supply before beginning installation.

The T87F is adaptable to most 2-wire, 24 to 30 volt heating systems and to most 3-wire, 24 to 30 volt heating systems controlled with a Series 10 Thermostat.

See Fig. 3-7 for typical application hookups. When using the T87F for cooling control, refer to the hookups in the Q539 Subbase instructions.

For variations of these systems, refer to the installation instructions for the controlled equipment.

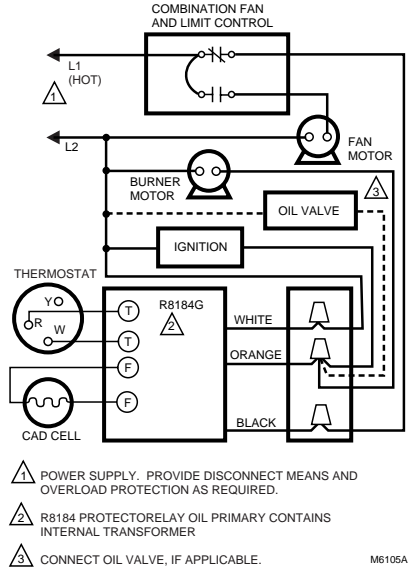


Fig. 3. T87F used for 2-wire, spst control of heating only in a typical oil system. Low voltage power for control circuit is supplied by transformer in oil primary control.

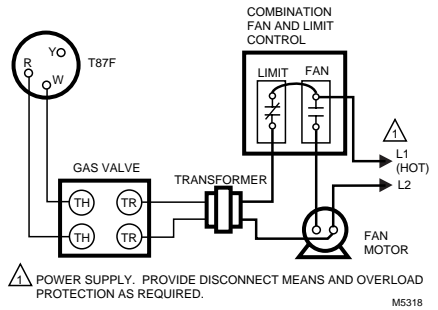


Fig. 4. T87F used for 2-wire, spst control of heating only in a typical gas system.

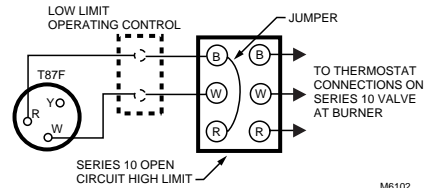


Fig. 5. T87F replacing Series 10 Thermostat connected to 3-wire, open-contact, high-limit control.

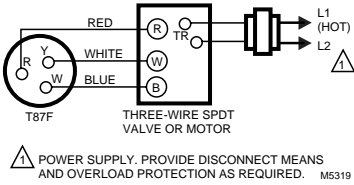


Fig. 6. T87F used for series 203-wire, spst control of low-voltage motors and electric radiator valves. Used in applications where thermostat makes contact on both rise and fall in room temperature.

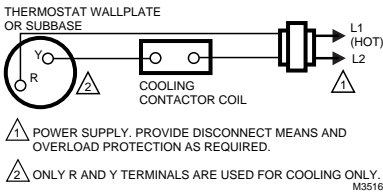


Fig. 7. T87F used in cooling only system.

Mounting Thermostat to Wallplate or Subbase

To remove standard cover, pull ring outward with fingertips, pressing lightly on dial with thumbs.

To remove locking cover, loosen the three screws along the cover edge with the Allen wrench supplied. Remove the cover as indicated above.

Remove and discard the plastic insert protecting the mercury switch.

Align the thermostat over the wallplate and tighten the three captive mounting screws. These captive screws complete the electrical connections to the thermostat. Adjust heat anticipator to match current rating of primary control. See Fig. 8.

Heat Anticipator Setting

If the T87F is used for 3-wire, spdt, heating-only (series 20) control (Fig. 6), set the heat anticipator for 1.2 (far left end of scale). A fixed resistor type heater is provided in the 137421A or 198170A Wallplate for this application. For other control applications, proceed as follows.

Adjust anticipator to match current rating of primary control. Rating is usually stamped on the control nameplate. Move the indicator to the marking that matches this rating. Indicator may be moved with fingers or pencil point through hole shown in Fig. 8. If the current rating is not given, proceed as follows before mounting the thermostat:

1. Connect an ac ammeter of appropriate range (0 to 2.0A, for example) between the R and W terminals on the wallplate or subbase.
2. Let the system operate for one minute before reading the ammeter.
3. Move the anticipator indicator to match the ammeter reading.

NOTE: A slightly higher setting to obtain longer burner-on times (fewer cycles per hour) may be desirable for some systems.

RECALIBRATION

The T87F is calibrated at the factory; recalibration should not be necessary. If the thermostat is accurately leveled but continues to be out of calibration, order 104994A Calibration Wrench. Instructions for recalibrating are included with wrench.

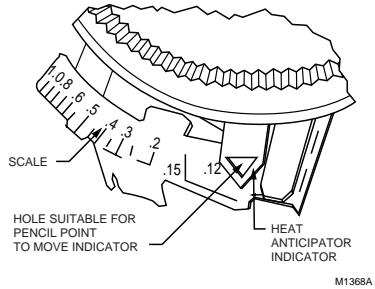


Fig. 8. Setting heat anticipator current rating.

CHECKOUT

Heating

1. Turn down temperature setting to lowest point. If subbase or remote switching is used, move System switch to Heat position.
2. Raise temperature setting until heating equipment starts.
3. Lower temperature setting below room temperature and heating system should shut down.
4. Make certain all equipment responds properly to the thermostat.
5. Heating equipment should stop when dial is turned below room temperature.

Cooling



CAUTION

Equipment Damage Hazard.
Operating cooling equipment within guidelines can prevent compressor damage.

Do not operate cooling when outdoor temperature is below 10°C (50°F).

Allow five-minute off-time after compressor has run before restarting.

1. If T87F controls cooling, move System switch (if used) to Cool position.
2. Lower temperature setting until cooling equipment starts.
3. Raise setting above room temperature and cooling system should shut down.
4. Make certain all equipment responds properly to the thermostat.

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