

Electronic Programmable Thermostats

INSTALLATION INSTRUCTIONS

APPLICATION

The Thermostats provide electronic programmable control for 24 to 30 Vac heating and cooling systems.



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 an old control.

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

Electrical Shock Hazard.
Can cause personal shock or equipment damage.
Disconnect power supply before beginning installation.

Location

Install the thermostat about 5 ft. (1.5m) 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 Plate Installation

1. Position mounting plate on the wall.
2. Use a level to make sure mounting plate is level. Level for appearance only; the thermostat functions correctly even when not level. See Fig. 2.
3. Use a pencil to mark the two mounting holes. See Fig. 1.

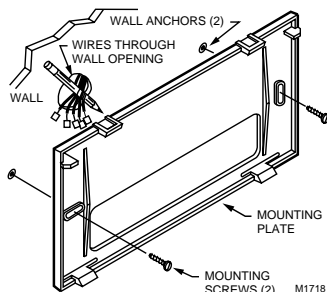


Fig. 1. Installing mounting plate.

1. Remove mounting plate from the wall, and drill 3/16 in. holes in wall (if drywall) as marked. For firmer material such as plaster or wood, drill 7/32 in. holes.
2. Gently tap anchors (provided) into drilled holes until flush with the wall.
3. Reposition mounting plate over holes, pulling wires through wiring opening.
4. Loosely insert two mounting screws into holes.
5. Tighten mounting screws.



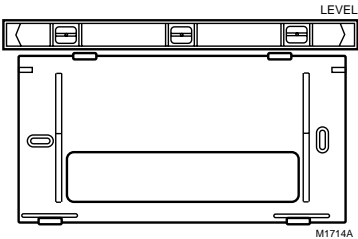


Fig. 2. Leveling mounting plate.

ADJUSTMENTS

Adjust Fan Operation Switch, as Required

The thermostat Fan Operation switch, labeled Fuel Switch, is factory set in the F position. See Fig. 3. This is the correct setting for most systems.

If your system is an electric heat system, set the switch to E. The E setting allows the fan to turn on immediately with the heating or cooling in a system where the G terminal is connected.

Adjust System On-time, as Required

The system on-time is factory-set for a warm air, gas or oil heating system. If you are installing it on another type of system, adjust the system on-time accordingly by setting DIP switches 1 and 2 on the back of the thermostat. See Table 1.

Table 1. Setting System On-Time.

Heating System	DIP Switch Position		Fuel Switch Position
	1 - On	2 - On	
Warm air furnace	1 - On	2 - On	F
Hot water or high efficiency warm air furnace	1-Off	2 - On	F
Electric furnace	1 - On	2 - Off	E

- For longer furnace on-time, readjust DIP switches 1 and 2 as follows:
- Warm Air Furnace—set at the Hot Water setting (1—Off, 2—On).
 - Electric Furnace—Leave at the Warm Air Furnace setting (1—On, 2—Off).

NOTE: This thermostat does not have a setting for steam/gravity air. Cycles would not be long enough for accurate temperature control.

IMPORTANT
When using a high efficiency furnace such as a 90 percent or greater AFUE (Average Fuel Utilization Efficiency) unit, set DIP switch 1 to Off and set DIP switch 2 to On.

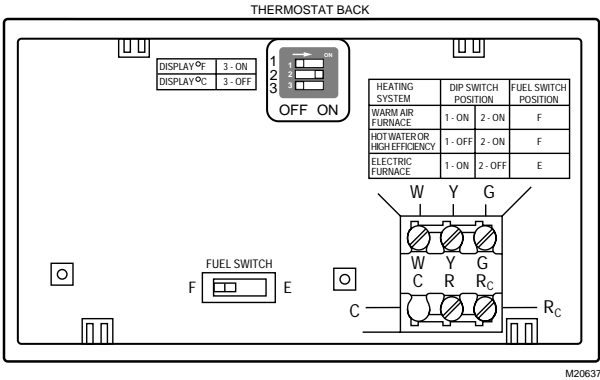


Fig. 3. Back view of thermostat.

Adjust Display Temperature (Select Models)

This thermostat can be adjusted to display degrees Fahrenheit (°F) or Celsius (°C). See Table 2 to set display preference.

Table 2. Setting temperature display.

Temperature Display	DIP Switch Position
Display °F	3 - On
Display °C	3 - Off

WIRING

Wiring Thermostat

All wiring must comply with local electrical codes and ordinances. Refer to Fig. 4 through 7 for typical hookups. A letter code is located near each terminal for identification. See Table 2 for terminal cross reference information.

CAUTION

Electrical Shock Hazard.
Can cause personal injury or equipment damage.
Disconnect power before wiring.

1. Connect the system wires to the thermostat. See Fig. 8. A letter code is located near each terminal for identification.

NOTE: Hold the thermostat as shown in Fig. 9 to minimize need for wire extenders.

2. Securely tighten each terminal screw.
3. Push excess wire back into the hole.
4. Plug hole with nonflammable insulation to prevent drafts from affecting the thermostat.

Table 3. Terminal Functions.

Thermostat Terminal	Function
G	Fan
Y	Cooling
W	Heating
Rc	Air conditioning power
R	Furnace power

2-WIRE HEAT-ONLY (JUMPER INTACT)

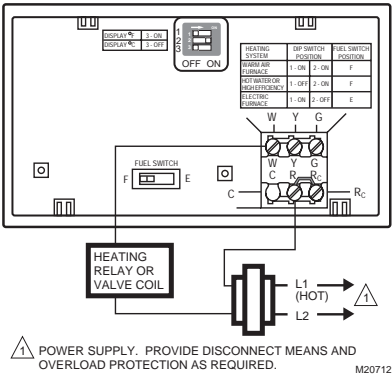


Fig. 4. Typical hookup in two-wire heat only (jumper intact) application.

4-WIRE HEAT/COOL (JUMPER INTACT)

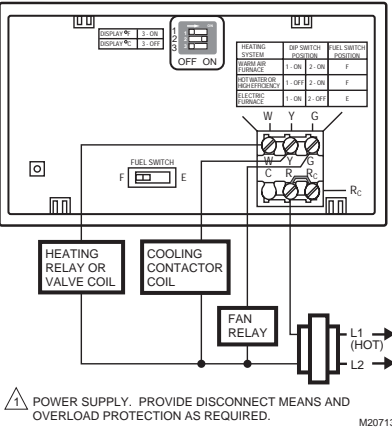


Fig. 5. Typical hookup in four wire heat and cool (jumper intact) application.

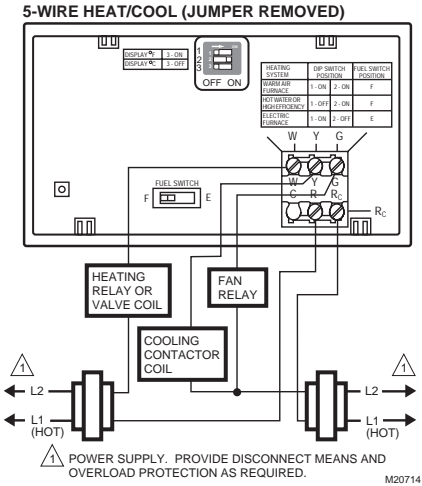


Fig. 6. Typical hookup in five wire heat and cool (jumper removed) application.

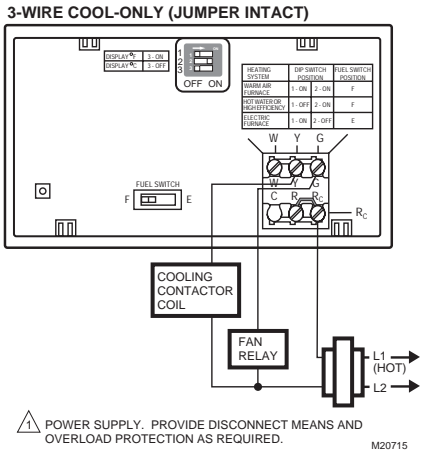


Fig. 7. Typical hookup in three wire cool only (jumper intact) application.

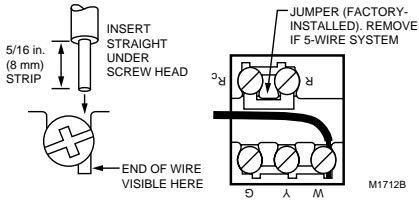


Fig. 8. Correct wiring technique.

MOUNTING

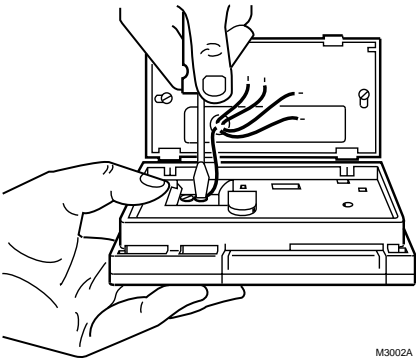


Fig. 9. Holding thermostat while installing.

Mounting Thermostat on Mounting Plate

1. Engage tabs at the top of thermostat and mounting plate. See Fig. 10 and 11.
2. Press lower edge of case to latch.

NOTE: To remove the thermostat from the wall, first pull out at the bottom of the thermostat; remove top last.

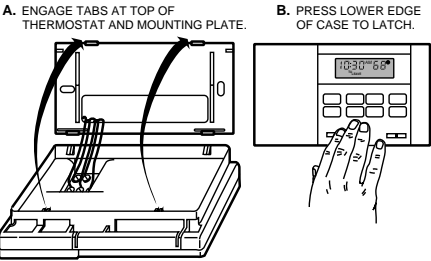


Fig. 10. Mounting thermostat on mounting plate.

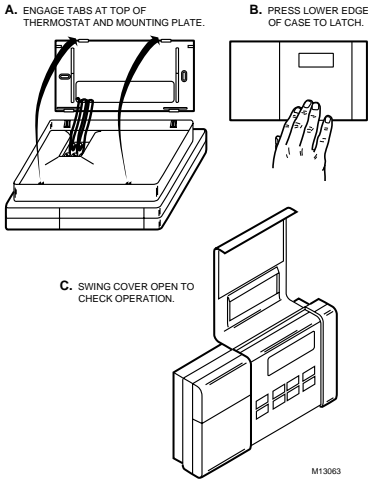


Fig. 11. Swinging cover open to check operation.

Installing Batteries

IMPORTANT

Batteries must be installed for programming and operation of the thermostat and heating/cooling system.

1. Use two AA alkaline batteries; nonalkaline batteries will not last as long, and can leak, causing damage to the thermostat or wall surface. Energizer batteries are recommended.
2. Make sure the thermostat is set to the Off position.
3. Use a coin to remove the battery door. See Fig. 12.
4. Install the new batteries; be sure positive and negative terminals are oriented correctly. See Fig. 13.
5. Replace battery door.

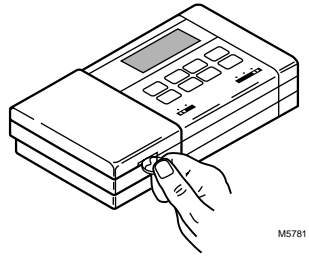


Fig. 12. Removing battery door.

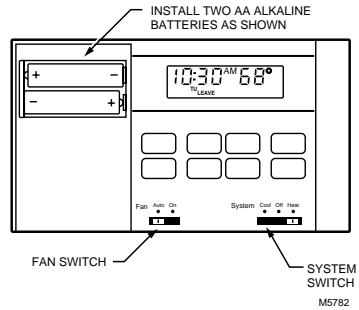


Fig. 13. Installing batteries.

As the batteries are running low, a "bAt Lo" indicator flash for one to two months before batteries run out completely. Replace the batteries as soon as possible after the indicator starts flashing.

After the batteries are completely dead, bAt Lo indicator disappears, leaving the display completely blank and the heating and/or cooling system not operating.

To remove batteries, press down on the left ends. If the new batteries are installed within 20 to 30 seconds of removing the old ones, the thermostat does not require reprogramming. If the display is blank, the batteries are dead or incorrectly installed and the thermostat has to be reprogrammed. See Owner's Guide for programming instructions.

SETTINGS

Current Time/Day

To set time, press and release the **Set Clock/Day** key. Press the **Time** keys until the current time shows.

To set day, press and release the **Set Clock/Day** key again. Press the **Time** keys until the current day shows. Press **Run Program** key.

See Owner's Guide for complete programming instructions.

Fan Switch

- **Fan Auto:** Normal setting for most homes. A single-speed fan turns on automatically with the air conditioner of furnace. A two-speed fan usually runs on high with the air conditioner and on low with the furnace.

NOTE: When Fan Operation switch on the back of the thermostat is in E position, the fan operates only with the furnace.

- **Fan On:** The fan runs continuously. Used to improve air circulation during special occasions or for more efficient electronic air cleaning.

System Switch

System switching positions control thermostat operation as follows:

Cool: Thermostat controls air conditioning system.

Off: Both the heating and air conditioning systems are off.

Heat: Thermostat controls heating system.

CHECKOUT

Heating

Do *not* check heating system operation by jumpering thermostat terminals at the primary control such as the gas valve, zone valve, or oil burner control. This damages the thermostat. Instead, jumper R and R wires at the thermostat.

Cooling

IMPORTANT

To avoid possible compressor damage, do not operate the cooling system when outside temperature is below 50°F (10°C). See compressor manufacturer instructions for further information. When cooling setting is changed, thermostat can delay up to five minutes before turning on the air conditioner. This delay protects the compressor.

Fan

Move the thermostat System switch to Off and the Fan switch to On. The fan should run continuously. With the System switch in the Off position, move the Fan switch to Auto; the fan should stop.

Move the System switch to Heat and the Fan switch to Auto.

Press key until the setting is about 10°F (6°C) above room temperature. Heating should start and the Fan should run after a short delay (immediately if fan Operation switch on back of thermostat is set in the E position).

Press key until setting is about 10°F (6°C) below room temperature. The heating equipment should shut off.

Move the System switch to Cool and the Fan switch to Auto.

Press key until setting is about 10°F (6°C) below room temperature. The cooling equipment and fan should turn on.

Press key until the setting is about 10°F (6°C) above room temperature. The cooling equipment and fan should turn off.

Move the System switch to Off and the Fan switch to Auto. The system and fan should turn off.

TROUBLESHOOTING GUIDE

If...	Then...
Display does not come on.	<ul style="list-style-type: none"> Set the System switch to Off. Remove batteries. Insert batteries backward for at least five seconds to reset thermostat. Correctly replace batteries. Display should come on. Make sure batteries are fresh and installed correctly.
Temperature display does not go lower than 45° F (7° C) or higher than 88° F (31° C) during programming.	<ul style="list-style-type: none"> The temperature setting limit is reached. The setting range is 45° F to 88° F (7° C to 31° C).
Temperature change occurs at the wrong times.	<ul style="list-style-type: none"> Check the program times for the period in question. Be sure that AM and PM indications are correct. Make sure the current day and time are correct. Reprogram if necessary.
Heating does not come on.	<ul style="list-style-type: none"> Check that System switch on thermostat is set to Heat. Allow a minimum of five minutes for time guard protection to expire. Check the system fuse or circuit breaker and replace or reset if necessary. Check for correct wiring and good connections. Disconnect and jumper wires R and W. If heat does not come on, check the heating system. If display is blank or says "bAt Lo," install fresh batteries.
Cooling will not come on.	<ul style="list-style-type: none"> Check that System switch on thermostat is set to Cool. Allow a minimum of five minutes for time guard protection to expire. Check the system fuse or circuit breaker and replace or reset if necessary. Check for correct wiring and good connections. Disconnect and jumper wires R and Y. If cooling does not come on, check the cooling system. If display is blank or says "bAt Lo," install fresh batteries. The thermostat has a built-in time delay on cooling. Allow at least five minutes after changing the setting before the air conditioner starts. Make sure outdoor disconnect is engaged (on). If temperature setting is lower than current temperature, and System On indicator is lit, move System switch from Cool to Off for ten minutes. After ten minutes, return System switch to Cool position. If air conditioner comes on, compressor could have reached its high limit temperature protection and shut down. If 2- or 4-wire installation, verify that R-Rc jumper is installed
Too warm or too cool.	<ul style="list-style-type: none"> Press Run Program key to check the current temperature setting. If desired, change the temperature setting. See the Owner's Guide.
System On indicator is lit, but no heat is coming from the registers.	<ul style="list-style-type: none"> Allow time for the furnace to heat up and the fan to come on before checking for heat at the register. (Check to make sure the Cycle Rate in the Installation section is correct.)
Thermostat current temperature setting does not match the display temperature within $\pm 1^{\circ}$.	<ul style="list-style-type: none"> Check that the wiring hole in the wall behind the wallplate was plugged with insulation to prevent drafts that could adversely affect thermostat operation. Be aware that it is normal for the current setting and display temperature to differ on occasion. During recovery from setback or setup, setting and display temperatures can differ for up to 30 minutes after recovery period.
bAtLo remains on display after batteries are installed.	<ul style="list-style-type: none"> Remove batteries. Wait one hour. Install fresh Alkaline batteries.

NOTICE

This equipment is a Class B digital apparatus, which complies with Canadian Radio Interference Regulations, CRC c.1374.

Honeywell

Automation and Control Solutions

Honeywell International Inc.	Honeywell Limited-Honeywell Limitée
1985 Douglas Drive North	35 Dynamic Drive
Golden Valley, MN 55422	Scarborough, Ontario
	M1V 4Z9

