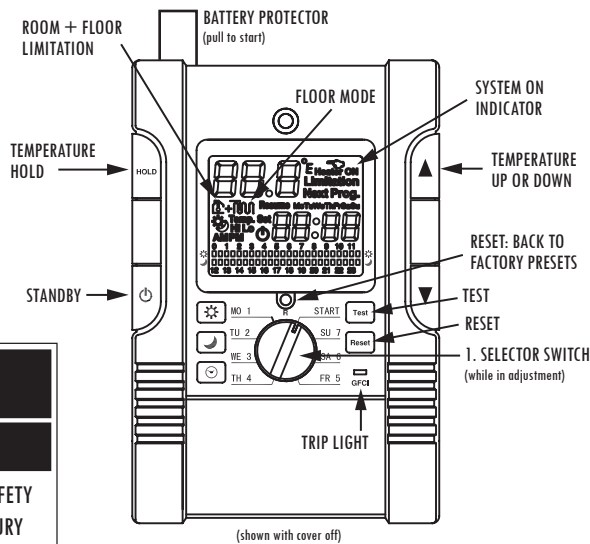


GENERAL INFORMATION

EF, EFP-GFCI
120 and 230 Models
5 milliamp / 20 milliamp
Class A / Class B
Single Pole



SPECIFICATIONS:

Temperature range: 40° to 95°F
 Display Format: Liquid Crystal Display (LCD)
 Display size: Large Format
 Sample rate: Every 60 Seconds
 Delay on or off: 3 Minutes
 Heat indicator: LCD "Heater On"
 Relay rating: 16 Amps Inductive
 Memory Backup
 Accuracy: ± .2°F
 Maximum Amps: 16 Inductive Continuous
 Maximum Watts: 3840 @ 240V or 1 hp
 3328 @ 208V or ¾ hp
 1920 @ 120V or 1/2 hp
 Total resistive or inductive motor load combined can not exceed 16 Amps
 Minimum Watts: 0
 Power Supply: 230 Volts AC or 120V

⚠ DANGER ⚠
ELECTRIC SHOCK OR FIRE HAZARD
 READ ALL WIRE SIZING, VOLTAGE REQUIREMENTS AND SAFETY DATA TO AVOID PROPERTY DAMAGE AND PERSONAL INJURY



GENERAL INFORMATION:

This thermostat is designed to provide the best temperature control for residential line voltage electric floor heating. For use on 208 / 240 Volt AC and a total of 16 Amps load inductive continuous.

Almost all residential application electric heaters installed as original equipment by an electrician will be 208 or 240 Volt. It is very rare that a home, apartment or condominium would be wired with all 120 Volt heaters. Check the voltage to make sure you have the right thermostat for your heater voltage. A 2-pole or double-wide circuit breaker at the panel indicates a 240 Volt circuit; A 1-pole or single-wide breaker indicates a 120 Volt circuit. There are some exceptions to this rule; Check with a voltmeter to determine accurate phase to phase voltage.

Be safe and smart! Electricity can cause severe injury or death if not treated with respect and caution.

OPERATION:

There are 2 operating modes for the EF Series thermostat, either mode requires the floor sensor to be connected to work properly:

- 1) *Floor Mode:* floor temperature controls heating
- 2) *Room + Floor Limitation:* room air temperature as the priority command to heating system with floor temperature limited.

The factory default setting is "Heating and Room sensor disabled". This precision electronic thermostat uses a very sensitive thermistor near the bottom to sense room air temperature and the same sensor on the end of a wire for embedding into the floor tile. This sends the information on to the microprocessor. As the temperature drops, the information sent will indicate if heat is needed. To reduce any undesirable fast on/off cycles, the processor has a built-in delay, up to 3 minutes. This saves energy and provides the best temperature control of an area. The unit will automatically operate the mode that has been detected.

This thermostat is powered by the line voltage and has memory backup. EFP model: *The default program setting is 62°F set back, 70°F set up and a standard work week timing when powered up if programmable. The day and time of day can be adjusted by selecting the CLOCK position and using the ▲ ▼ arrow keys. For an override, the ▲ UP arrow increases temperature and the ▼ DOWN arrow reduces temperature without any need to readjust the programming.*

The thermostat may take a few hours to stabilize the room temperature; Do not be alarmed when the thermostat does not show the correct temperature immediately after installation.

INSTALLATION:

This line voltage device should be installed and serviced by a qualified electrician. The thermostat has been designed to mount to a standard 2" x 4" electrical outlet box. Leveling of the thermostat is not required. #6-32 Phillips head mounting screws are provided.

Mount the thermostat in the room where the heating is to be controlled (except for floor heating only) about 5 feet above the floor, avoiding outside walls as they are too cold and will inhibit the thermostat's performance. The unit may be fitted directly on the wall. Avoid mounting the thermostat where there may be direct sunlight, plumbing pipes in the wall, or placing a lamp or TV too close to the thermostat. Heat from such items negatively affects the thermostat's performance.

WIRING INSTRUCTIONS



EF, EFP-GFCI

120 and 230 Models
5 milliamp / 20 milliamp
Class A / Class B

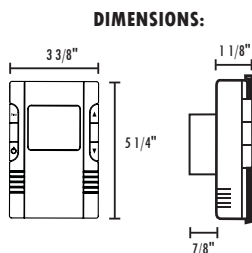
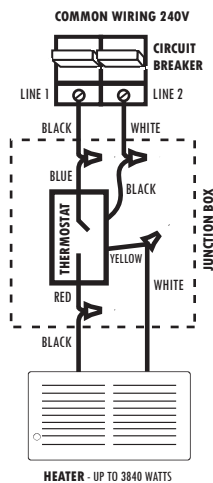
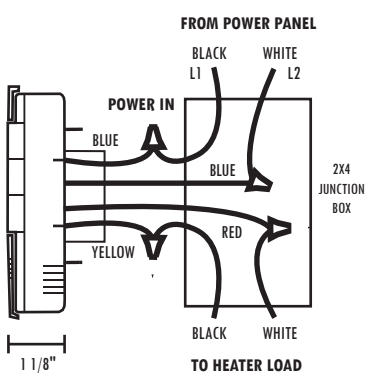
Single Pole

⚠ DANGER ⚠

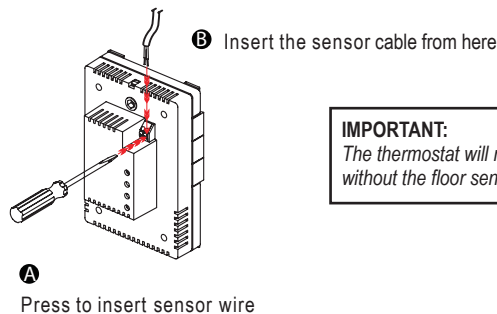
ELECTRIC SHOCK OR FIRE HAZARD

READ ALL WIRE SIZING, VOLTAGE REQUIREMENTS AND SAFETY DATA TO AVOID PROPERTY DAMAGE AND PERSONAL INJURY

- To wire the thermostat determine which pair of wires are coming from the breaker panel and which pair lead to the heater.
- Take a black lead from the circuit breaker panel and attach it to the blue lead on the thermostat. Attach the white lead to the black of the thermostat.
- Take the black lead that goes to the heater and attach it to the yellow lead on the thermostat. Attach the white lead to the red lead of the thermostat. This will provide power to the heater when the thermostat calls for heat.
- Remove cover of thermostat by placing thumb on LCD display and forefinger on top of cover, pulling cover back to expose mounting screws and programming buttons. Remote sensors should be attached to terminals on back and sensor placed 1 - 3" away from wire heating wires in floor.
- Push the wires carefully into the junction box making sure no wires are pinched or obstruct the screws mounting the thermostat. Now attach the thermostat to the wall with the #6-32 Phillips head screws provided.
- Hold thermostat in wallbox and place screws in top and bottom mounting hole. Attach to wallbox. Install batteries and replace cover.
- Turn on power. Test by increasing set point to higher than room temperature by tapping the ▲ Up button. There will be up to a 3 minute delay turning on. You will hear a small click and "Heater On" will appear on the LCD; the heater should now be on. Turn the thermostat down by tapping on the ▼ Down arrow.



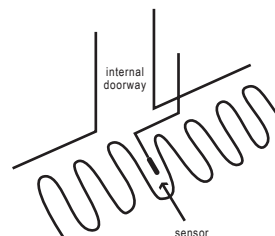
Floor Sensor Cable



IMPORTANT:
The thermostat will not operate without the floor sensor connected.

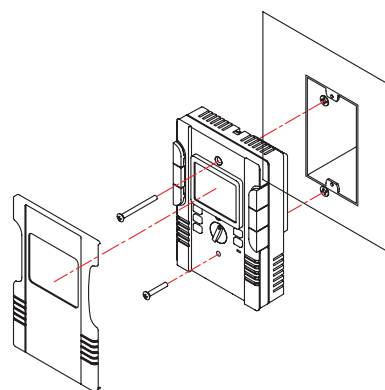
Place floor sensor wires into two terminals by pushing spring tabs and route outside of high voltage junction box.

Place floor sensor in an open area where the floor will not be covered. (Ex: just inside an interior doorway)



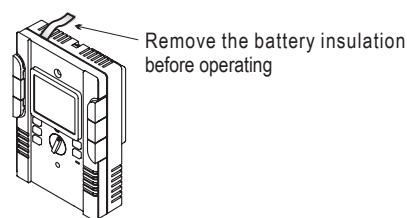
IMPORTANT:
Never cross over heating cables with sensor wire!

Dismantle Plastic Housing and Mounting



Batteries

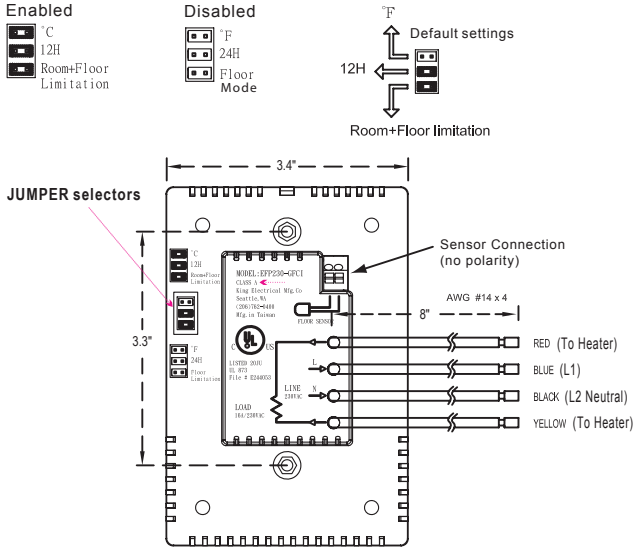
This thermostat uses a rechargeable LIR2032 battery located under the front cover.



EF/EFP-GFCI SETUP INSTRUCTIONS



1 Jumper Selection



Jumpers are set for normal operation. Adjust if needed.

WIRING

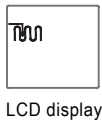
- Blue: Attach to L1 Power in.
- Black or White: Attach to L2 Power in or Neutral.
- Red: Attach to Heater (Load).
- Yellow: Attach to Heater (Load).

2 Adjustment

- 1 Press ▼ and ▲ for 5 seconds to enter adjustment mode. Follow the flashing guide on the LCD to complete adjustment. The content varies depending on the chosen operating mode. Make certain the thermostat is not in OFF mode.

3 Floor Temperature Only Setup (EF only)

Floor sensor control only (see adjustment mode.)



- 1 Press and hold ▼ and ▲ buttons until screen is blank with °F or °C flashing only. Press ▲ to switch from °F or °C display. Press ⏻ for next step.
- 2 "Hi Limit" temperature for floor heating is flashing. Press ▼ or ▲ to adjust. Press ⏻ for next step.
- 3 **EF ONLY:** "Lo Limit" temperature for floor is flashing. Press ▼ or ▲ to adjust. Press ⏻ for next step. (No "Lo Limit" on Room + Floor Mode)
- 4 Set differential 1.2, 2.0, 4.0 or 6.0 degrees over or under set point which can be selected depending on preference. 2 to 4 is typical floor differential.

NOTE: Within "Floor only mode", "Comfort" setpoint cannot be above "Hi Limit" and "Economy" setpoint cannot be set lower than "Lo Limit".

4 Wood Floors

Maximum of 80°F is recommended for wood flooring. Tile floors can run higher. 113°F is the maximum temperature of the thermostat.

4 Room + Floor Limitation Setup

Room air and floor temperature control (see adjustment mode and enable jumper on circuit board).



LCD display

- 1 Press and hold ▼ and ▲ buttons until screen is blank with °F or °C flashing only. Press ▲ to switch from °F or °C display. Press ⏻ for next step.
- 2 "Hi Limit" temperature for floor heating is flashing. Press ▼ or ▲ to adjust. Press ⏻ for next step.
- 3 **EF ONLY:** "Lo Limit" temperature for floor is flashing. Press ▼ or ▲ to adjust. Press ⏻ for next step. (No "Lo Limit" on Room + Floor Mode)
- 4 Set differential .4, .8, 1.2, 1.6, or 2.0 degrees over or under set point which can be selected depending on preference. 2 to 4 is typical air differential.

NOTE: "Room + Floor Limitation mode", "Comfort" setpoint cannot be above "Hi Limit".

5 Manual Temperature Setting

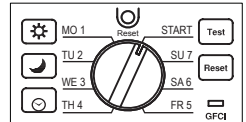
While the thermostat is operating the temperature setpoint can be increased or decreased by pressing ▼ or ▲.

When operating in "OVERRIDE" mode a flashing ⏻ will appear on the LCD screen.

Manual change of the temperature setpoint will not alter the "Comfort" or "Economy" settings.

6 To Program

Switch dial to MO 1. (See Programming sheet)



Each day can be adjusted for time and temperature.

7 Batteries

A "BATTERY LOW" function is included in the design of this thermostat. To avoid low battery power which may effect the thermostat's circuitry, the protective function will automatically shut off the relay until the batteries are replaced.

When the batteries are low the LCD display shall alternate flashing to show:



After 10 minutes the relay output will be shut off until the batteries are replaced. All programmed operating modes and internal settings will not be lost because of low batteries.

Press "RESET" to clear all programming and restore to default settings.

8 Clock Adjustment

- 1 Turn rotary switch to START.
- 2 Press ⏻.
- 3 Press ▼ or ▲ to select the day of the week.
- 4 Press ⏻.

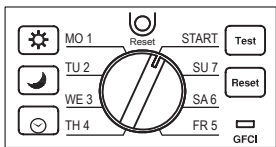
EF/EFP-GFCI PROGRAMMING INSTRUCTIONS



1 Comfort ☀ and Economy 🌙 Setting

To adjust setup (comfort) and setback (economy) temperatures.

- Turn rotary switch to START.
- Press twice to enter ☀ room temperature "HI" (comfort) setpoint. Press ▼ or ▲ to adjust.
- Press twice to enter 🌙 room temperature "LO" (economy) setpoint. Press ▼ or ▲ to adjust.
- Wait 5 seconds after adjusting the temperature. The thermostat shall memorize setting and return to the main screen.



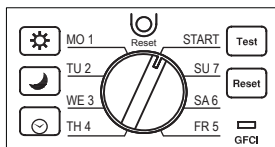
This thermostat has only two air temperature settings: 7 independent days and 30 minute increments. Users can adjust Comfort ☀ and Economy 🌙 time to their schedule.

2 Independant Daily Time Schedule Setting

If the dial is left in anything but the START position it will default to "ERR" (Error). Turn to START to clear Error and restart programming.

Factory default settings are 70°F/21°C ☀ and 61°F/16°C 🌙.

- Turn indicator on rotary switch to the desired week day and start setting.
- Press or to alter the setting between ☀ and 🌙 on the LCD display.
- Press ▼ or ▲ to select each individual time schedule. Each time schedule will be indicated by flashing symbols.
- After setting all 7 days of the week turn rotary switch to "START". The thermostat will now start to operate its program.

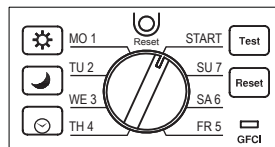


3 Hold

Press "HOLD" for constant temperature.

4 Manual (Temporary Override)

- Turn indicator on rotary switch to "START".
- Press ▼ or ▲ to indicate current ☀ or 🌙 temperature settings.
- Press ▼ or ▲ to adjust temperature setting.
- The LCD display will flash for approximately 8 seconds after temperature setting is complete then return to the main LCD display screen. The thermostat will now begin to execute the Manual function.
- Turn the rotary switch away from "START" then turn it back to "START" to terminate the Manual function.



When in Comfort ☀ while setting the Manual function the thermostat will maintain executing Manual until the program runs to Economy 🌙. The same is true in Economy 🌙.

The ☀ and 🌙 icons will disappear from the LCD at the section of time the Manual function is operating.

5 Floor Temperature Only Setup (EF only)

Floor sensor control only (see adjustment mode.)



LCD display

- Press and hold ▼ and ▲ buttons until screen is blank with °F or °C flashing only. Press ▲ to switch from °F or °C display. Press for next step.
- "Hi Limit" temperature for floor heating is flashing. Press ▼ or ▲ to adjust. Press for next step.
- EF ONLY:** "Lo Limit" temperature for floor is flashing. Press ▼ or ▲ to adjust. Press for next step.
- Set differential 1.2, 2.0, 4.0 or 6.0 degrees over or under set point which can be selected depending on preference. 2 to 4 is typical floor differential.

Maximum floor temperature: 113°F, Minimum: 68°F

NOTE: Within "Floor only mode", "Comfort" setpoint cannot be above "Hi Limit" and "Economy" setpoint cannot be set lower than "Lo Limit".

6 Room + Floor Limitation Setup

Room air and floor temperature control (see adjustment mode and enable jumper on circuit board.)



LCD display

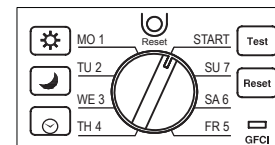
- Press and hold ▼ and ▲ buttons until screen is blank with °F or °C flashing only. Press ▲ to switch from °F or °C display. Press for next step.
- "Hi Limit" temperature for floor heating is flashing. Press ▼ or ▲ to adjust. Press for next step.
- EF ONLY:** "Lo Limit" temperature for floor is flashing. Press ▼ or ▲ to adjust. Press for next step. (No "Lo Limit" on Room + Floor Mode on EFP)
- Set differential .4, .8, 1.2, 1.6 or 2.0 degrees over or under set point which can be selected depending on preference. 8 is typical air differential.

Maximum floor temperature: 113°F, Minimum: 68°F

NOTE: Within "Room + Floor Limitation mode", "Comfort" setpoint cannot be above "Hi Limit".

7 Clock

- Turn indicator on rotary switch to "START".
- Press to enter clock programming.
- Press ▼ or ▲ to select the day of the week.
- Press again to adjust hour of day.
- Repeat pressing and ▼▲ to finishing setting the time.
- LCD display shall automatically memorize the setting and return to the main screen 5 seconds after time is set.



8 GFCI TEST

To test GFCI protection:

- Press .
- Red GFCI light should light to indicate on.
- Press to begin normal operation.