

INSTALLATION AND MAINTENANCE

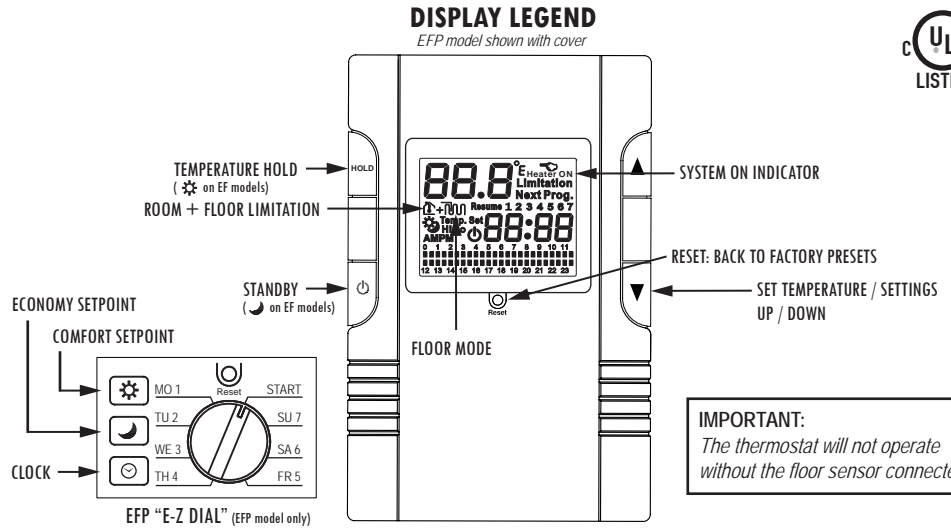
EF - EFP Series



⚠ DANGER ⚠

ELECTRIC SHOCK OR FIRE HAZARD

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



⚠ WARNING ⚠

READ CAREFULLY - These instructions were written to help prevent difficulties that might arise during thermostat installation. Studying the instructions first may save considerable time and money later. Observing the following procedures will keep installation time to a minimum. Save these instructions for future use.

Thank you for buying this King thermostat. It should provide years of service and comfort to your home. Inspect the package. Enclosed should be the thermostat with its cover and two screws.



1. Check the total load of the heaters being connecting to the thermostat. The maximum wattage at 240 Volt is 3840 Watts, 208 Volt is 3328 Watts, 120 Volt is 1920 Watts and 16 Amps/480 Watts at 30 Volt DC. It is important to stay below this total wattage when connecting the thermostat. Lower wattage prolongs the the life of the contacts in the relay.
2. To wire the thermostat determine which pair of wires are coming from the breaker panel and which pair lead to the heater.
3. Remove cover of thermostat by placing thumb on LCD display and fingers on top edge of cover. Pull towards you. This will expose the top mounting screw. Put thumb on the lower part of the battery cover and pull down to expose mounting screw and battery compartment.
4. There may be a pair of white wires connected in your junction box. If so, leave them alone and work with the black wires. If there is only a black wire and white wire use them - this is called a **switch leg** (see wiring diagram).
5. Take a black lead and attach it to the black lead on the thermostat.
6. Take the other black heater lead (white if **switch leg**) and attach it to the red lead on the thermostat. This will provide power to the heater when the thermostat calls for heat.
7. Push the wires carefully into the junction box making sure no wires are pinched or will obstruct the screws mounting the thermostat. Now attach the thermostat to the wall using the #6-32 Phillips head screws provided. Replace cover. Do not over tighten screws.
8. Install AA batteries to start display. Replace cover. **Batteries operate relay and display only**; they are not charged by line voltage power and should last one year.
9. Turn on power. Test by increasing set point to higher than current room temperature by tapping the ▲ Up button. There will be up to a 3 minute delay in turning on. You will hear a small click and "Heater On" will appear in the LCD; the heater should be on now. Turn the temperature down by tapping on the ▼ Down arrow.
10. You have now verified the thermostat is in perfect working order and ready for years of trouble-free operation.
11. **Mounting tips:** Make sure nothing is nearby (a.g. plumbing pipes in the wall, a lamp close by, direct sunlight, a T.V. set, and/or cold drafts from a door opening) that could affect the average room temperature sensing of the thermostat. Typically the best, most convenient location is on inside walls above the light switch for that room. **The thermostat will not operate without the floor sensor connected.**
12. **Cleaning:** Canned compressed air works great to clear any dust accumulation, while a damp cloth will additionally clean the plastic case surface of finger prints. Strong spray cleaners may damage the plastic case or remove writing or arrows screen-printed on case. Blow out any dust that may accumulate on top or bottom air vents. Good air circulation is key to long life and accurate operation.
13. **Humid locations:** Mildly humid location like bathrooms may reduce life due to corrosion on the contact and lint from towels getting into thermostat air vents. To extend life blow out vent regularly and mount thermostat away from shower locations.


EF-EFP SETUP INSTRUCTIONS



1 Sensor Selection

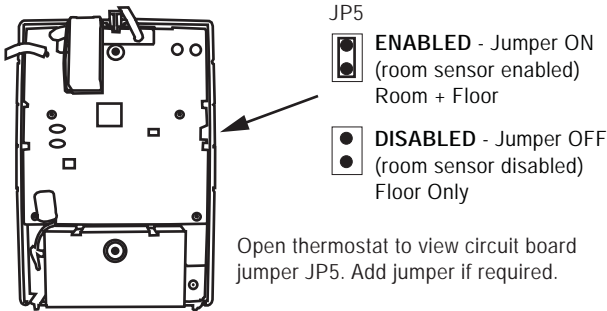
This selection provides 2 operating modes:

- 
FLOOR MODE (floor heating only, floor sensor controls on/off temperature)
 Floor sensor controls heated floor only.
Room sensor must be disabled!
- 
ROOM + FLOOR LIMITATION
 Room sensor controls room air with the floor sensor controlling floor temperature limitation.
Room sensor must be enabled! (see below)




Be certain the floor sensor cable is connected!
 No programming can be done without the floor sensor attached.

To enable or disable the room sensor look for "JUMPER" selection on inside of thermostat on circuit board as shown in image. Choose "enabled" or "disabled". A jumper cap is included in the accessory bag.







2 Adjustment

- 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.)

- 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.  LCD display
- "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)
- 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

- 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)
- 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

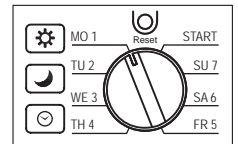
While the thermostat is operating the temperature setpoint can be increased or decreased by pressing **▼** or **▲**.

When operating in "OVERRIDE" mode  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.



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









- Turn rotary switch to RUN.
- Press .
- Press **▼** or **▲** to select the day of the week.
- Press .

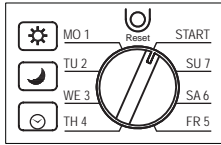




EFP PROGRAMMING INSTRUCTIONS

1 Comfort and Economy Setting

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



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









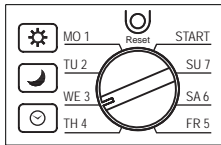
This thermostat has only two air temperature settings: 7 independent days and 30 minute increments. Users can adjust Comfort  and Economy  time to their schedule.

2 Independent 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 .







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

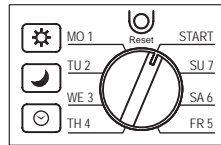





3 Hold



Press "HOLD" for constant temperature.

4 Manual (Temporary Override)

- 1 Turn indicator on rotary switch to "START".
- 2 Press  or  to indicate current  or  temperature settings.
- 3 Press  or  to adjust temperature setting.
- 4 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.
- 5 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

- 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.
- 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.

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

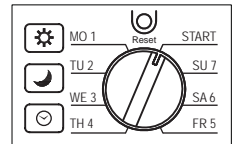
- 1 Press and hold  and  buttons until screen is blank with °F or °C flashing only. Press  to switch from °F or °C display. Press  for next step.
- 2 "Hi Limit" temperature for floor heating is flashing. Press  or  to adjust. Press  for next step.
- 3 **EF ONLY:** "Lo Limit" temperature for floor is flashing. Press  or  to adjust. Press  for next step. (No "Lo Limit" on Room + Floor Mode on EFP)
- 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. 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

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



8 Wood Floors

A maximum temperature of 80° F is recommended for wood flooring.

9 Batteries

This thermostat uses 2 x AA batteries located under the front cover.

WIRING INSTRUCTIONS



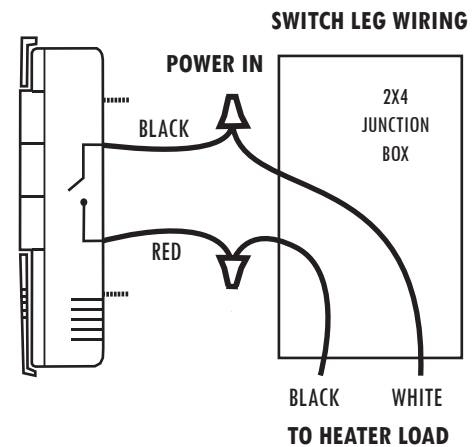
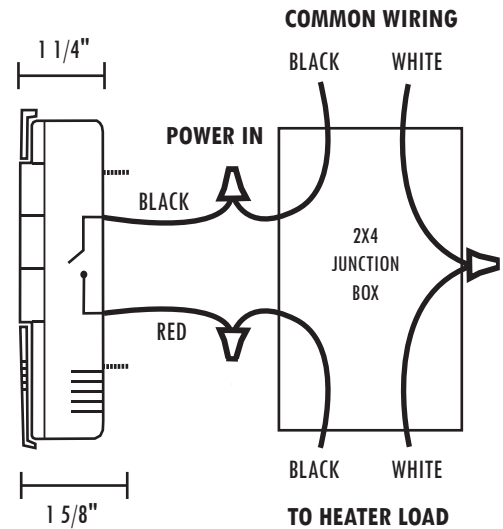
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⚠ DANGER ⚠

ELECTRIC SHOCK OR FIRE HAZARD

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

1. To wire the thermostat determine which pair of wires are coming from the breaker panel and which pair lead to the heater.
2. Take a black lead from the circuit breaker panel and attach it to the black lead on the thermostat.
3. Take the black lead that goes to the heater and attach it to the red lead on the thermostat. This will provide power to the heater when the thermostat calls for heat.
4. 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. Slide battery cover off to expose lower mounting screw.
5. 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.
6. Hold thermostat in wallbox and place screws in top and bottom mounting hole. Attach to wallbox. Install batteries and replace cover.
7. 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.



DIMENSIONS:

