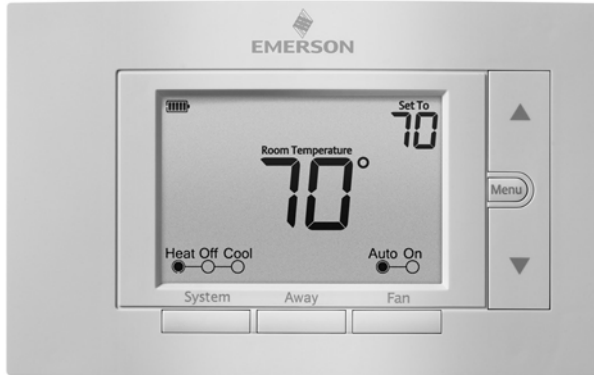




Smart Heating Solutions

## 1F85U-22NP (Non-Programmable) Installation and Operating Instructions

Battery Powered or Hardwired with Common



### INDEX

Optional Accessory: Wall Cover-Up Plate F61-2663, 6-3/4" W x 4-1/2" H

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Thermostat Applications	Maximum Stages Heat/ Cool
Conventional Gas, Oil, Electric (mV and 24V), Heat only, Cool only or Heat/Cool Systems	2/2
Heat Pump (Air Source or Geothermal) with Aux. Heat	2/1

**MERCURY NOTICE:** This product does not contain mercury. However, this product may replace a product that contains mercury. Mercury and products containing mercury must not be discarded in household trash. Refer to [www.thermostat-recycle.org](http://www.thermostat-recycle.org) for information on disposing of products containing mercury.

### SPECIFICATIONS

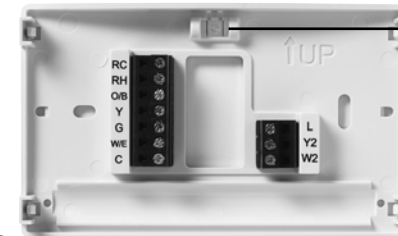
<b>Electrical Rating:</b>			
Battery Power	mV to 30VAC, NEC Class II, 50/60 Hz		
Input-Hardwire	20 to 30VAC, NEC Class II, 50/60 Hz		
Terminal Load	1.5 A per terminal, 2.5A maximum all terminals combined		
Setpoint Range	45° to 99° F (7° to 37° C)		
Rated Differentials (@ 6°F/ Hr):	Fast	Med	Slow
Heat (Conventional Gas / Oil / Elect)	0.5°F	0.75°F	1.9°F
Cool (Central Air)	0.9°F	1.2°F	1.7°F
Heat Pump (Heat and Cool)	0.9°F	1.2°F	1.7°F
Heat Pump Aux.	0.5°F	0.75°F	1.9°F
Operating Ambient	32°F to +105°F (0° to +41°C)		
Display Temperature Range	32°F to +99°F (0 to 37°C)		
Operating Humidity	90% non-condensing maximum		
Shipping Temperature Range	-20°F to + 150°F (-29° to +65°C)		
Thermostat Dimensions	3-3/4" H x 6" W x 1-1/8" D		

## THERMOSTAT INSTALLATION

### WIRING

Refer to equipment manufacturer's instructions for specific system wiring information. After wiring, see INSTALLER MENU for proper thermostat configuration. Wiring table shown are for typical systems and describe the thermostat terminal functions. Wiring will change when dedicated emergency heat is on (See Installer Menu #15).

Terminal Designations	Terminal Function
RC	Power (24V) - Cooling
RH	Power (24V) - Heating
O/B 6 (not shown) - 3 wire zone valve	Reversing Valve or output for 3 wire zone valves Configurable as "O" or "B" Reversing Valve or 3 wire zone heat (power close)
Y	1st Stage Compressor (conventional or heat pump)
G	Fan Relay
W/E	1st Stage Heat (conventional); 1st Stage Auxiliary Heat (heat pump) Can operate as Emergency Heat only (See Installer Menu #15)
C	Common wire for 24V (optional with batteries)
L	Heat Pump Malfunction / Diagnostic terminal (input signal requires common)
Y2	2nd Stage compressor (conventional only)
W2	2nd Stage Heat (Conventional) Can operate as 1st Stage Auxiliary Heat (See Installer Menu #15)



**Leveling Thermostat**  
Leveling is for appearance only and will not affect thermostat operation.

### Precautions

- Do not exceed the specification ratings.
- All wiring must conform to local and national electrical codes and ordinances.
- This control is a precision instrument, and should be handled carefully. Rough handling or distorting components could cause the control to malfunction.

#### WARNING

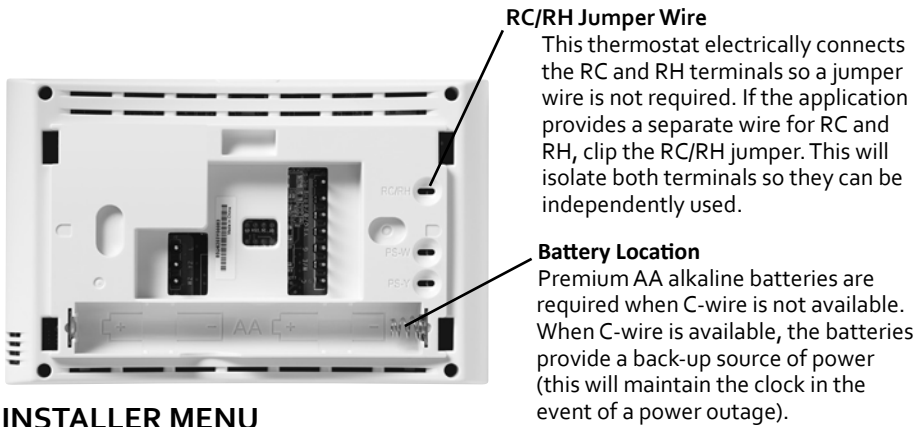
Do not use on circuits exceeding specified voltage. Higher voltage will damage control and could cause shock or fire hazard.  
Do not short out terminals on gas valve or primary control to test. Short or incorrect wiring will burn out thermostat and could cause personal injury and/or property damage.

#### CAUTION

To prevent electrical shock and/or equipment damage, disconnect electrical power to system, at main fuse or circuit breaker box, until installation is complete.

#### CAUTION

To prevent compressor and/or property damage, if the outdoor temperature is below 50°F, DO NOT operate the cooling system.  
Do not allow the compressor to run unless the compressor oil heaters have been operational for 6 hours and the system has not been operational for at least 5 minutes.



## INSTALLER MENU

To prevent changes that may affect system performance, this thermostat has an INSTALLER MENU and a USER MENU. The INSTALLER MENU provides access to every option, while the USER MENU provides access to items that will not affect system performance. To access the INSTALLER MENU press the **Menu** button for 8 seconds. The display will show item **05** in the table below. Use **Next** and **Back** to navigate through menu items. Press **▲** or **▼** to change a menu setting.

Installer Menu # (Hold Menu 8 Seconds)	Description	Default Setting (flashing icons)	Settings (Press ▲ or ▼)
<b>05</b>	<b>Outdoor Equipment:</b> selects air conditioner (AC) or heat pump (HP) equipment as well as the number of stage	AC2	AC0 AC1 AC2 HP1
<b>10</b>	<b>Indoor Equipment:</b> selects whether the equipment is a gas furnace, electric furnace or fan only	EL2	FAN GA1 GA2 (conventional only) EL1 EL2 (conventional only)
<b>15</b> <i>dE</i>	<b>Dedicated Emergency:</b> W/E only operates in Emergency Aux mode. W2 becomes 1st stage Aux. Heat	OFF	On OFF
<b>20</b> <i>R</i>	O,B or 3 Wire Zone Valve Selection	O	O B 3
<b>30</b> <i>CR</i>	<b>Heat Cycle Rate:</b> how often the heat will turn on	MEd	SLO – slow MEd – medium FAS – fast
<b>32</b> <i>CR</i>	<b>Aux Cycle Rate:</b> how often the auxiliary heat will turn on	MEd	SLO – slow MEd – medium FAS – fast
<b>35</b> <i>CR</i>	<b>Cool Cycle Rate:</b> how often the cooling will turn on	MEd	SLO – slow MEd – medium FAS – fast
<b>50</b> <i>CL</i>	<b>Compressor Lockout:</b> protects the compressor from short cycling	OFF	On – 5 minute delay OFF – no delay
<b>65</b>	<b>Max Heat Limit:</b> maximum set point for heat mode	99	47 to 99
<b>66</b>	<b>Minimum Cool Limit:</b> minimum set point for cool mode	45	45 to 97

## INSTALLER MENU (Continued)

Installer's Menu # (Hold Menu 8 Seconds)	Description	Default Setting (flashing icons)	Settings (Press ▲ or ▼)
<b>79</b>	Fahrenheit or Celsius	°F	°F – Fahrenheit °C – Celsius
<b>81</b>	<b>Temperature Display Adjustment:</b> adjust the displayed "Room Temperature"	0	-5 to +5
<b>83</b> <i>dL</i>	<b>Continuous Display Light:</b> keep the backlight always on – "C" wire required	OFF	On – always on OFF – momentarily
<b>88</b>	<b>Auto Changeover:</b> thermostat automatically switches between heat and cool	OFF	On – enable auto OFF – disable auto
<b>99</b>	<b>Keypad Lock:</b> prevent unwanted changes to the thermostat	OFF	On – disable buttons OFF – all buttons are active

## TEST EQUIPMENT

Turn on power to the system.

### Fan Operation

If your system does not have a G terminal connection, skip to **Heating System**.

- 1.) Press the fan button to select the On position. The blower should begin to operate.
- 2.) Press the fan button to select the Auto position. The blower should stop immediately.

### Heating System

- 1.) Press the **System** button to select the **Heat** position. Heat Pumps only - if the auxiliary heating system has a standing pilot, be sure to light it.
- 2.) Press **▲** to adjust thermostat setting to 1° above room temperature. The heating system should begin to operate and the thermostat will indicate **Heat On**.
- 3.) For heat pumps with auxiliary- Press **▲** to adjust thermostat setting to 3° above room temperature. The auxiliary heat should begin to operate and the thermostat will indicate **Heat On Aux**.
- 4.) Press **▼** to adjust thermostat setting 1° below room temperature. The heating system should stop operating and the **Heat On** icon will disappear.

### Auxiliary System ( only for heat pumps with auxiliary)

- 1.) Press the system button to select the **Aux** position. This bypasses the heat pump and runs auxiliary only heat.
- 2.) Press **▲** to adjust thermostat setting to 1° above room temperature. The auxiliary heating system should begin to operate and the thermostat will indicate **Heat On Aux**.
- 3.) Press **▼** to adjust thermostat setting 1° below room temperature. The auxiliary heating system should stop operating and the **Heat On Aux** icon will disappear.

### Cooling System

- 1.) Press the **System** button to select the **Cool** position.
- 2.) Press **▼** to adjust thermostat setting 1° below room temperature. The blower should come on immediately on high speed, followed by cold air circulation. The thermostat will indicate **Cool On**. There can be up to a 5 minute delay. (see INSTALLER MENU, item 50)
- 3.) Press **▲** to adjust thermostat setting to 1° above room temperature. The cooling system should stop operating and the **Cool On** icon will disappear.

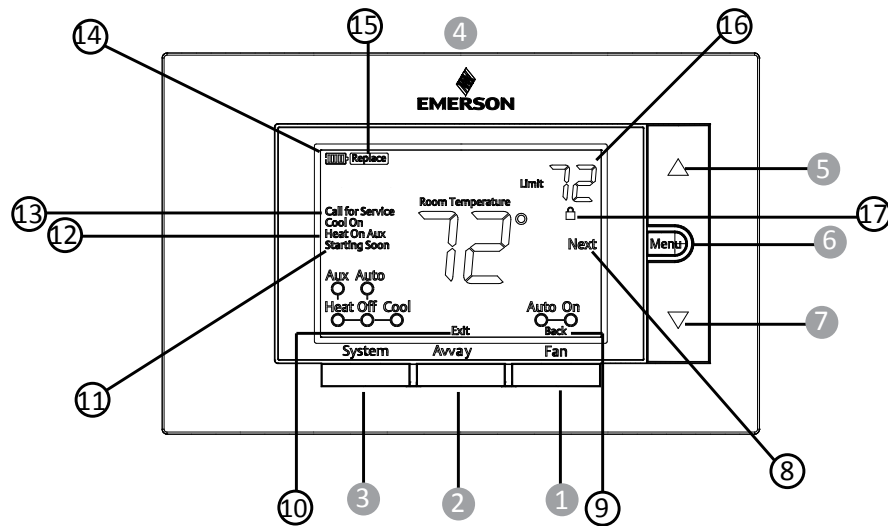
*Note: If **Starting Soon** is shown on the display, the compressor lockout feature is operating. There will be up to a 5 minute delay before the compressor turns on (see INSTALLER MENU, item 50).*

# USING THE THERMOSTAT

## THERMOSTAT OVERVIEW

Before you begin using your thermostat, you should be familiar with its features, display and the location/operation of the thermostat buttons and switches.

THERMOSTAT BUTTONS AND SWITCHES	THE DISPLAY
1.) Fan Button	8.) <b>Next (Menu button)</b> is used to navigate within a menu
2.) Away Button (set a frequently used temperature)	9.) <b>Back (Fan button)</b> is used to navigate within a menu
3.) System Button	10.) <b>Exit (Away button)</b> returns to the home screen
4.) Backlight Button (located on the top of the thermostat)	11.) Thermostat is protecting the equipment from short cycling (5-minute delay)
5.) Raises Temperature Setting	12.) Indicates that the system is running in Cool, Heat or Auxiliary mode. (Heat Pump Only -The auxiliary will run in Heat mode when the heat pump cannot maintain the set temperature.)
6.) Access Menu Options	13.) <b>SEE TROUBLESHOOTING</b>
7.) Lowers Temperature Setting	14.) Battery status indicator
	15.) Replace battery indicator
	16.) Temperature setpoint
	17.) Appears when the keypad is locked (to prevent unwanted changes)



Whenever "Replace" appears in the display, new premium brand AA alkaline batteries should be installed. If the house will be unoccupied for an extended period and either "Replace" or "Replace" is displayed, install new batteries before leaving.

## USER MENU

To customize thermostat settings, press the **Menu** button from the home screen. Use the ▲ or ▼ buttons to highlight **Settings** and press **Next**. Use **Next** and **Back** to navigate through menu items. Press ▲ or ▼ to change the setting.

User's Menu # (Press Menu button and release)	Description	Default Setting (flashing icons)	Settings (Press ▲ or ▼)
01	Fahrenheit or Celsius	°F	°F – Fahrenheit °C – Celsius
02	Temperature Display Adjustment: adjust the Room Temperature	0	-5 to +5
03 <i>dL</i>	Continuous Display Light: keep the backlight always on – "C" wire required	OFF	On – always on OFF – momentarily
04	Auto-Changeover: thermostat automatically switches between heat and cool	OFF	On - enable auto OFF - disable auto
05	Keypad Lock: prevent unwanted changes to the thermostat	OFF	On – disable buttons OFF – all buttons are active

## THERMOSTAT OPERATION

- Away** – Stores a frequently used temperature setting so that you can select it with a touch of the Away button. To set an Away temperature press temp up ▲ or temp down ▼ to the temperature you want. At the desired setting, hold the Away button for 3 seconds. When the setting is stored the set point will flash one time. You can store an Away setting for both Cool and Heat modes. (Example: Set an Away temperature to 88°F in the summer for cooling and 55°F in the winter for heating.)
- Keypad Lockout** – To prevent unwanted changes, the buttons can be disabled. To turn this feature On, press and hold ▲ and the **Menu** button until the appears (this can also be turned on in the menu). To turn Off, press and hold ▲ and the **Menu** button for 3 seconds.

## TROUBLESHOOTING

Symptom	Possible Cause	Corrective Action
No Heat/ No Cool/ No Fan (common problem)	<ol style="list-style-type: none"> <li>1.) Blown fuse or tripped circuit breaker</li> <li>2.) Furnace power switch to OFF</li> <li>3.) Furnace blower compartment door panel loose or not properly installed</li> <li>4.) Loose connection to thermostat or system</li> </ol>	<ol style="list-style-type: none"> <li>1.) Replace fuse or reset breaker</li> <li>2.) Turn switch to ON</li> <li>3.) Replace door panel in proper position to engage safety interlock or door switch</li> <li>4.) Tighten Connections</li> </ol>
No Heat	<ol style="list-style-type: none"> <li>1.) System not set to Heat</li> <li>2.) Loose connection to thermostat or system</li> <li>3.) Heating System requires service or thermostat requires replacement</li> </ol>	<ol style="list-style-type: none"> <li>1.) Set thermostat to Heat.</li> <li>2.) Verify thermostat and system wires are securely attached.</li> <li>3.) Diagnostic: Set System to Heat and raise the setpoint above room temperature. Within five minutes the thermostat should make a soft click sound and "Heat On" should appear on display. This sound indicates the thermostat is operating properly. If the thermostat does not click, try the reset operation listed below. If the thermostat does not click after being reset, contact your heating and cooling service person or place of purchase for a replacement. If the thermostat clicks, contact the furnace manufacturer or a service person to verify the heating system is operating correctly.</li> </ol>
No Cool	<ol style="list-style-type: none"> <li>1.) System not set to Cool</li> <li>2.) Loose connection to thermostat or system</li> <li>3.) Cooling System requires service or thermostat requires replacement</li> </ol>	<ol style="list-style-type: none"> <li>1.) Set thermostat to Cool.</li> <li>2.) Verify thermostat and system wires are securely attached.</li> <li>3.) Diagnostic: Set System to Cool and lower setpoint below room temperature. Same procedures as diagnostic for "No Heat" condition except set the thermostat to Cool and lower the setpoint below the room temperature. There may be up to a five minute delay before the thermostat clicks in Cooling if the compressor lock-out option is selected in the installer menu. (see INSTALLER MENU, item 50)</li> </ol>
Heat, Cool or Fan Runs Constantly	Possible short in wiring, thermostat, heat, cool or fan system	Check each wire connection to verify they are not shorted or touching other wires. Try resetting the thermostat. If the condition persists contact your HVAC service person.
Thermostat Display & Thermometer Disagree	Thermostat display requires adjustment	Display can be adjusted +/-5°. See User Menu item 05
Furnace (Air Conditioner) Cycles Too Fast or Slow (narrow or wide temperature swing)	The location of the thermostat and/or the size of the Heating System may be influencing the cycle rate	Digital thermostats provide precise control and cycle faster than older mechanical models. The system turns on and off more frequently, but runs for a shorter time. If you would like to increase cycle time, choose SLO for slow cycle in the Installer menu. (Reference menu items 30, 32 & 35.) If an acceptable cycle rate is not achieved, contact your HVAC service person.

(Troubleshooting continued on next page)

## TROUBLESHOOTING (Continued)

Symptom	Possible Cause	Corrective Action
"Call for Service" icon appears on display	<ol style="list-style-type: none"> <li>1.) Heating system is not able to heat the space to within 10 degrees of the setpoint within 2 hours</li> <li>2.) Cooling system is not able to cool the space to within 10 degrees of the setpoint within 2 hours</li> <li>3.) If "--" is displayed for the Room Temperature, a replacement thermostat is needed</li> <li>4.) None of the buttons operate on the thermostat</li> <li>5.) If "Call for Service" is flashing, compressor self diagnostic is detecting an issue with the outdoor unit</li> </ol>	<ol style="list-style-type: none"> <li>1.) See corrective action for "No Heat"</li> <li>2.) See corrective action for "No Cool"</li> <li>3.) Replace thermostat</li> <li>4.) Make sure keypad lockout is not turned on (🔒), if it's OFF, try reset shown below.</li> <li>5.) Contact a service person to verify the outdoor equipment is operating correctly</li> </ol>

### Resetting the Thermostat or Thermostat Settings

If the thermostat has good batteries, but has a blank display or does not respond to key presses, the thermostat should be reset by removing the batteries for 2 minutes. This reset will not change the menu settings or program. If the condition persists after reinstalling the batteries, replace the thermostat.

To conveniently reset only the schedule and user settings back to factory defaults, press **Menu** and **Backlight** buttons at the same time and hold until the display goes blank and resets.