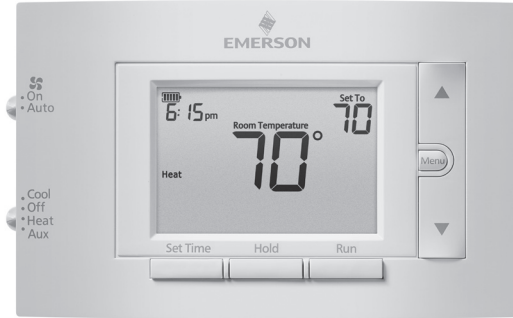




# 1F83H-21PR (Programmable) Installation and Operating Instructions Heat Pump Thermostat Battery Powered or Hardwired with Common



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



## INDEX

|                         |     |
|-------------------------|-----|
| Thermostat Installation | 2-4 |
| Wiring                  | 2   |
| Installer Menu          | 3-4 |
| Using the Thermostat    | 5-7 |
| Thermostat Overview     | 5   |
| User Menu               | 6   |
| Thermostat Operation    | 6   |
| Thermostat Schedule     | 7   |
| Troubleshooting         | 7-8 |
| Homeowner Help Line     | 8   |

| Thermostat Applications                                                                                                         | Maximum Stages Heat/ Cool |
|---------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Single Stage Compressor, Heat Pump Systems (air source or geothermal) – 1 Stage Aux/Emergency Heat, Electric or Gas (Dual Fuel) | 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

|                                  |                                                         |              |
|----------------------------------|---------------------------------------------------------|--------------|
| Electrical Rating:               |                                                         |              |
| Battery Power .....              | 20 to 30 VAC, NEC Class II, 50/60 Hz                    |              |
| Input-Hardwire .....             | 20 to 30 VAC, 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 Pump (Heat).....            | 0.9°F                                                   | 1.2°F 1.7°F  |
| Heat Pump (Cool) .....           | 0.9°F                                                   | 1.2°F 1.7°F  |
| Auxiliary Heat.....              | 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

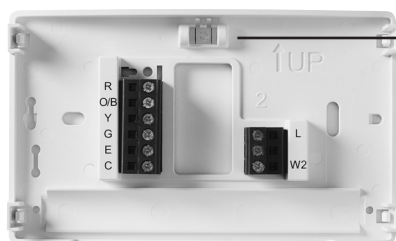
## WIRING

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.

| Terminal Designations | Terminal Function                                                                     |
|-----------------------|---------------------------------------------------------------------------------------|
| R                     | Power (24V)                                                                           |
| O/B                   | Changeover Terminal-Energized in Cool (O) or Heat (B) for Heat Pump or Damper Systems |
| Y                     | Heat and Cool Mode 1st Stage Compressor                                               |
| G                     | Fan Relay                                                                             |
| E*                    | Auxiliary only Heat Mode (Emergency Heat)                                             |
| C                     | Common wire for 24V (optional with batteries)                                         |
| L                     | Heat Pump malfunction / Diagnostic terminal (input signal requires common)            |
| W2*                   | Heat Mode – 2nd stage                                                                 |

\*Cut W2/E jumper when separate heat sources are used for W2 and E.

**IMPORTANT:** For Dual Fuel Heat Pump applications, be sure to turn on the Dual Fuel Logic option (found in the Installer's Menu)



**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.

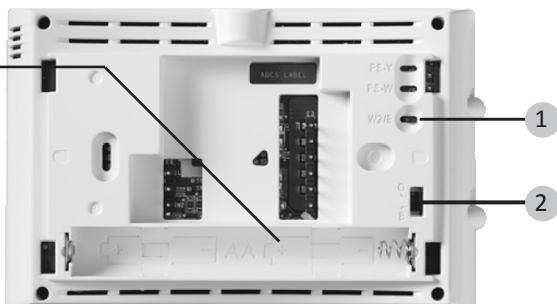
Do not short out terminals on gas valve or primary control to test. Short or incorrect wiring will burn out thermostat and could cause personal injury and/or property damage.

### **⚠ 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.

### Battery Location

Premium AA alkaline batteries are required when C-wire is not available. When C-wire is available, the batteries provide a back-up source of power (this will maintain the clock in the event of a power outage).



#### 1.) W2/E Jumper Wire

This thermostat electrically connect the W2 and E terminals so that you do not need to do this with a jumper wire. If your system has separate W2 and E wires, clip the W2/E jumper located on the back of the thermostat. This will isolate both terminals so they can be used independently.

#### 2.) O/B Terminal Switch

The O/B switch on this thermostat is factory set to the **O** position. This will accommodate the majority of heat pump applications, which require the changeover relay to be energized in **Cool**. If the heat pump being installed requires a **B** terminal to energize the changeover relay in **Heat**, the O/B switch must be moved to the **B** position.

## INSTALLER MENU

To prevent changes that may affect system performance, this thermostat has an INSTALLER'S MENU and a USER MENU. The INSTALLER'S MENU provides access to every option, while the USER MENU provides access to items that will not affect system performance. To access the INSTALLER'S MENU press the **Menu** button for 8 seconds. The display will show item **30** in the table below. Use **Next** and **Back** to navigate through menu items. Press **▲** or **▼** to change a menu setting.

| Installer's Menu #<br>(Hold Menu 8 Seconds) | Description                                                                                                    | Default Setting<br>(flashing icons) | Settings<br>(Press ▲ or ▼)                             |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------------------------|
| 30 <b>CR</b>                                | Heat Cycle Rate (how often the heat will turn on)                                                              | MEd                                 | SLO – slow<br>MEd – medium<br>FAS – fast               |
| 32 <b>CR</b>                                | Aux Cycle Rate (how often the auxiliary heat will turn on)                                                     | MEd                                 | SLO – slow<br>MEd – medium<br>FAS – fast               |
| 35 <b>CR</b>                                | Cool Cycle Rate (how often the cooling will turn on)                                                           | MEd                                 | SLO – slow<br>MEd – medium<br>FAS – fast               |
| 50 <b>CL</b>                                | Compressor Lockout<br>(protects the compressor from short cycling)                                             | OFF                                 | On – 5 minute delay<br>OFF – no delay                  |
| 60 <b>dF</b>                                | Dual Fuel Logic (turn On when using gas as the auxiliary heat source)                                          | OFF                                 | On- gas auxiliary heat<br>OFF- electric auxiliary heat |
| 65                                          | Maximum Heat Limit<br>(maximum set point for heat mode)                                                        | 99                                  | 47 to 99                                               |
| 66                                          | Minimum Cool Limit<br>(minimum set point for cool mode)                                                        | 45                                  | 45 to 97                                               |
| 74                                          | Schedule Type (set as either 7-Day, 5-1-1 Day or Non-Programmable)                                             | 5                                   | 7 – 7 Day<br>5 – 5-1-1 Day<br>0 – Non Programmable     |
| 76 <b>E</b>                                 | Early Start (starts heating or cooling early so your programmed temperature is reached by the programmed time) | OFF                                 | On – start early<br>OFF – start at program period time |

(Installer Menu continued on next page)

## INSTALLER MENU (Continued)

| Installer's Menu #<br>(Hold Menu 8 Seconds)                                          | Description                                                                 | Default Setting<br>(flashing icons) | Settings<br>(Press ▲ or ▼)                                   |
|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------------------|--------------------------------------------------------------|
| 79                                                                                   | Fahrenheit or Celsius                                                       | °F                                  | °F – Fahrenheit<br>°C – Celsius                              |
| 81                                                                                   | Temperature Display Adjustment<br>(adjust the displayed "Room Temperature") | 0                                   | -5 to +5                                                     |
| 83  | Continuous Display Light (keep the backlight always on – "C" wire required) | OFF                                 | On – always on<br>OFF – momentarily                          |
| 86                                                                                   | Change Air Filter (set up a monthly reminder)                               | OFF                                 | 1 to 12 – reminder time (months)<br>OFF – no filter reminder |
| 99  | Keypad Lock (prevent unwanted changes to the thermostat)                    | OFF                                 | On – disable buttons<br>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.) Move fan switch to On position. The blower should begin to operate.
- 2.) Move fan switch to Auto position. The blower should stop immediately.

### Heating System

- 1.) Move **System** Switch to **Heat** position. 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 heat pump system should begin to operate and the thermostat will indicate **Heat On**.
- 3.) Press ▲ to adjust thermostat setting to 3° above room temperature. The auxiliary heat should begin to operate and the thermostat will indicate **Heat On Auxiliary**.
- 4.) Press ▼ to adjust thermostat setting 1° below room temperature. The heating system should stop operating and the thermostat should indicate **Heat**.

### Auxiliary System

- 1.) Move **System** Switch to **Aux** position. 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 auxiliary heating system should begin to operate and the thermostat will indicate **Heat On Auxiliary**.
- 3.) Press ▼ to adjust thermostat setting 1° below room temperature. The auxiliary heating system should stop operating and the thermostat should indicate **Heat Auxiliary**.

### Cooling System

- 1.) Move **System** Switch to **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 thermostat will indicate **Cool**.

*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)*

### CAUTION

To prevent compressor and/or property damage, if the outdoor temperature is below 50°F, DO NOT operate the cooling system.

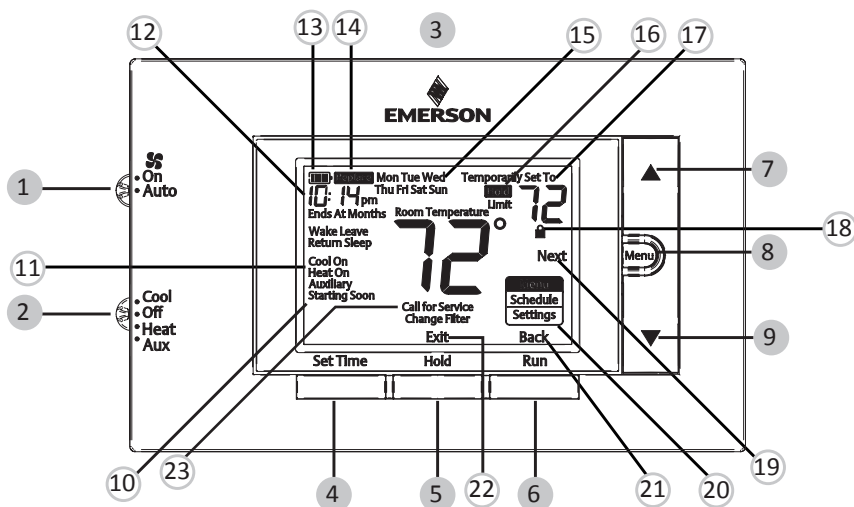
Do not allow the compressor to run unless the compressor oil heaters have been operational for 6 hours and the system has not been operational for at least 5 minutes.

## 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 Switch                                              | 10.) Thermostat is protecting the equipment from short cycling (5-minute delay)                                                                                         |
| 2.) System Switch                                           | 11.) Indicates that the system is running in cool, heat or auxiliary mode (The auxiliary will run in Heat mode when the heat pump cannot maintain the set temperature.) |
| 3.) Backlight Button (located on the top of the thermostat) | 12.) Displays the current time                                                                                                                                          |
| 4.) Set Correct Time                                        | 13.) Battery status indicator                                                                                                                                           |
| 5.) Hold a Permanent Temperature                            | 14.) Low battery indicator                                                                                                                                              |
| 6.) Cancels Hold – Returns to Programmed Schedule           | 15.) Day of the week used when programming a schedule                                                                                                                   |
| 7.) Raises Temperature Setting                              | 16.) Permanent hold (bypassing the schedule)                                                                                                                            |
| 8.) Access Menu Options                                     | 17.) Temperature setpoint                                                                                                                                               |
| 9.) Lowers Temperature Setting                              | 18.) Appears when the keypad is locked (to prevent unwanted changes)                                                                                                    |
|                                                             | 19.) <b>Next (Menu button)</b> is used to navigate within a menu                                                                                                        |
|                                                             | 20.) Access the schedule and customize thermostat features                                                                                                              |
|                                                             | 21.) <b>Back (Run button)</b> is used to navigate within a menu                                                                                                         |
|                                                             | 22.) <b>Exit (Hold button)</b> returns to the home screen                                                                                                               |
|                                                             | 23.) <b>SEE TROUBLESHOOTING</b>                                                                                                                                         |



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 and hold the **Menu** button for ½ second from the homescreen. 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 #<br>(Press Menu button and release)                                            | Description                                                                                                           | Default Setting<br>(flashing icons) | Settings<br>(Press ▲ or ▼)                                                 |
|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------|
| <b>01</b>                                                                                   | <b>Schedule Type</b> (set as either 7-Day, 5-1-1 Day or Non Programmable)                                             | <b>5</b>                            | <b>7</b> – 7 Day<br><b>5</b> – 5-1-1 Day<br><b>0</b> – Non-Programmable    |
| <b>02</b>  | <b>Early Start</b> (starts heating or cooling early so your programmed temperature is reached by the programmed time) | <b>OFF</b>                          | <b>On</b> – start early<br><b>OFF</b> – start at program period time       |
| <b>03</b>  | <b>Continuous Display Light</b> (keep the backlight always on – "C" wire required)                                    | <b>OFF</b>                          | <b>On</b> – always on<br><b>OFF</b> – momentarily                          |
| <b>04</b>                                                                                   | <b>Change Air Filter</b> (set up a monthly reminder)                                                                  | <b>OFF</b>                          | <b>1 to 12</b> – reminder time (months)<br><b>OFF</b> – no filter reminder |

## THERMOSTAT OPERATION

### Set Current Time and Day

*Note: Time icons will flash at initial power up or after a reset.*

- 1.) Press **Set Time**
- 2.) Use ▲ or ▼ to adjust the hour
- 3.) Press **Next** to advance to set the minutes and day of the week
- 4.) Press **Exit** when finished.

The default program is **5-1-1 Day**, but can be setup as a **7-Day** or **Non-Programmable** thermostat (refer to the **User Menu** above)

- **Hold Temperature (bypassing the schedule)** – With the **System Switch** set to **Heat** or **Cool**, momentarily press the **Hold** button. **Hold** will be displayed. Use ▲ or ▼ to adjust the temperature. The thermostat will hold the room temperature at the selected setting until you press **Run** to start program operation again.
- **Program Override (Temporary Hold)** – Press ▲ or ▼ until the desired temperature is displayed. The thermostat will override the schedule until the next programmed time period with a minimum override of 2 hours. Then the thermostat will automatically revert to the program.
- **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  icon appears. To turn Off, press and hold ▲ and the **Menu** button for 3 seconds.

# THERMOSTAT SCHEDULE / PROGRAMMING



**THERMOSTAT  
HELPER**

For tips on programming your thermostat to receive optimal comfort, convenience and energy savings go to: [thermostathelper.com](http://thermostathelper.com)

## Energy Saving Factory Schedule

This thermostat is programmed with the energy saving settings shown in the table below for all days of the week.

|                  | P1/Wake        | P2/Leave       | P3/Return      | P4/Sleep        |
|------------------|----------------|----------------|----------------|-----------------|
| Heating Schedule | 6:00 AM - 70°F | 8:00 AM - 62°F | 5:00 PM - 70°F | 10:00 PM - 62°F |
| Cooling Schedule | 6:00 AM - 78°F | 8:00 AM - 85°F | 5:00 PM - 78°F | 10:00 PM - 82°F |

*Note: Thermostat can be programmed on or off the subbase*

## Modify the Heating Schedule

- 1.) Slide the system switch to **Heat**
- 2.) Press **Menu**
- 3.) Press **Next** to enter the schedule
- 4.) The time icons will flash – use ▲ or ▼ to set the time for the start of a period
- 5.) Press **Next** – the set point icons will flash – use ▲ or ▼ to set the temperature for the current period
- 6.) Continue to press **Next** to advance through all periods (P1/Wake, P2/Leave, P3/Return, P4/Sleep) for all days of the week.

**Note:** Press **Back** to return to the previous setting. Once all days of the week have been programmed the thermostat will display **End**. Press **Exit** at any time to save changes and return to home screen.

## Modify the Cooling Schedule

- 1.) Slide the system switch to **Cool**
- 2.) Repeat steps 2-6 from the heating schedule

# TROUBLESHOOTING

| Symptom                                            | Possible Cause                                                                                                                                                                                            | Corrective Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No Heat/<br>No Cool/<br>No Fan<br>(common problem) | 1.) Blown fuse or tripped circuit breaker<br>2.) Furnace power switch to OFF<br>3.) Furnace blower compartment door panel loose or not properly installed<br>4.) Loose connection to thermostat or system | 1.) Replace fuse or reset breaker<br>2.) Turn switch to ON<br>3.) Replace door panel in proper position to engage safety interlock or door switch<br>4.) Tighten Connections                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| No Heat                                            | 1.) System Switch not set to Heat<br>2.) Loose connection to thermostat or system<br>3.) Heating System requires service or thermostat requires replacement                                               | Verify thermostat and system wires are securely attached.<br>Diagnostic: Set System Switch 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. |

(Troubleshooting continued on next page)

# TROUBLESHOOTING (Continued)

| Symptom                                                                              | Possible Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Corrective Action                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No Cool                                                                              | 1.) System Switch not set to Cool<br>2.) Loose connection to thermostat or system<br>3.) Cooling System requires service or thermostat requires replacement                                                                                                                                                                                                                                                                                                                 | Verify thermostat and system wires are securely attached.<br>Diagnostic: Set System Switch 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) |
| 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 04                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 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 & 35) If an acceptable cycle rate is not achieved, contact your HVAC service person.                                                                                              |
| "Call for Service" icon appears on display                                           | 1.) Heating system is not able to heat the space to within 10 degrees of the setpoint within 2 hours<br>2.) Cooling system is not able to cool the space to within 10 degrees of the setpoint within 2 hours<br>3.) If "--" is displayed for the Room Temperature, a replacement thermostat is needed<br>4.) None of the buttons operate on the thermostat<br>5.) If "Call for Service" is flashing, compressor self diagnostic is detecting an issue with the outdoor unit | 1.) See corrective action for "No Heat"<br>2.) See corrective action for "No Cool"<br>3.) Replace thermostat<br>4.) Make sure keypad lockout is not turned on (denoted by  )<br>5.) Contact a service person to verify the equipment is operating correctly                                                                                                                               |

## 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.

HOMEOWNER HELP LINE: 1-800-284-2925