

## ES100 ROUND DIGITAL NON-PROGRAMMABLE BATTERY OPERATED THERMOSTAT

The ES100 Digital Thermostat is designed to work on the following 24V systems. This Thermostat will not control multistage heat pumps or 100/120V line voltage electric heating systems.

- Gas-Standing Pilot
- Gas- Electronic Ignition
- Gas- Fired Boilers
- Oil-Fired Boilers
- Oil-Fired Furnace
- Single Stage Heat Pumps No-Auxiliary Heat
- Electric Air Conditioning



### 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

## INSTALLATION

### When Installing this Product...

1. Read these instructions carefully. Failure to follow them could damage the product or 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 these instructions.



### CAUTION

Electrical Shock or Equipment Damage Hazard.  
Can shock individuals or short equipment circuitry.  
Disconnect power supply before installation.

### Location

Install the thermostat about 1.5m(5ft) 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 the sun or appliances.
- Concealed pipes and chimneys.
- Unheated (uncooled) areas such as an outside wall behind the thermostat.

### The ES100 Models Include

- 2-AAA Alkaline Batteries
- 1-Switching Subbase
- 1-Wall Cover Plate (For Optional use to cover wall mark if needed)
- 6-Mounting Screws
- 1-Thermostat

### INSTALLING THE WALL PLATE AND SUBBASE

*NOTE: BEFORE REMOVING OLD THERMOSTAT FOLLOW LABELING INSTRUCTIONS ON PAGE 3.*

#### If using the wall plate Fig. 1:

1. Position the wall plate against the wall so that the arrow is pointing upward, position the square hole over the house thermostat wires and pull them through the hole.
2. Holding wall plate flat against the wall, use a pencil to mark the wall through the center of the slotted screw holes on the right and left of the wall plate. Remove the wall plate.

3. Drill a 1/4" hole at the locations you marked.

4. Insert a molly (provided) into each hole and gently tap in to level with the wall.

5. Re-position the wall plate to wall, pull house wires through the wiring opening and use the two 1" screws to attach the wall plate to the wall.

6. Position the switching subbase over the wall plate and pull house thermostat wires through the wiring opening. Connect the thermostat house wires to the appropriate wiring terminals before attaching the subbase to the wall plate.

7. Using the 3/8" screws, attach the subbase through the round hole on the left and the vertical slotted hole on the right of the subbase. Before tightening the screws you can rotate the subbase to level the thermostat.

#### If attaching switching subbase directly to the wall: (fig. 1.3 page 5)

1. Position the switching subbase against the wall with switches at top, position the square hole over the house wires and pull them through the hole.

2. Use a pencil to mark the wall through the round hole on the left of subbase and through the center of the slotted hole on the right. Remove the subbase.

3. Drill a 1/4" hole at the locations you marked.

4. Insert a molly (provided) into each hole and gently tap in to level with the wall.

5. Re-position the subbase to wall, pull house wires through the wiring opening and connect the thermostat house wires to the appropriate wiring terminals before attaching the subbase to the wall using the two 1"

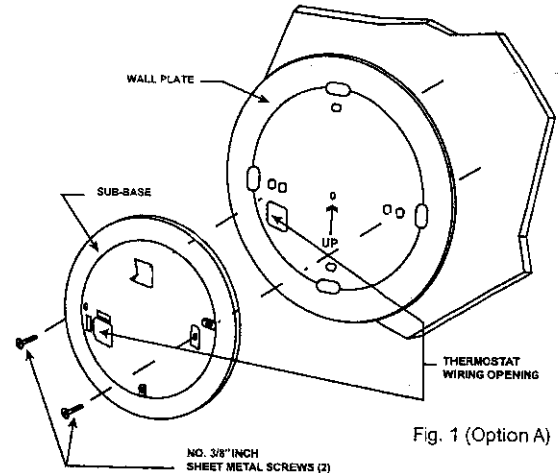


Fig. 1 (Option A)

#### If installing on an outlet box Fig. 2

1. Place the wall plate against the outlet box with arrow pointing up.

2. Pull the wires through the wiring opening.

3. Use the 1 / 2" screws to attach the wall plate to the box through the two horizontal slotted holes.

4. Place the switching subbase over the wall plate, pull the wires through the wiring hole in the subbase and connect the wires to the subbase terminals.

5. Use the 3/8" screws to attach the subbase to the wall plate as described under Fig. 1 item 7.

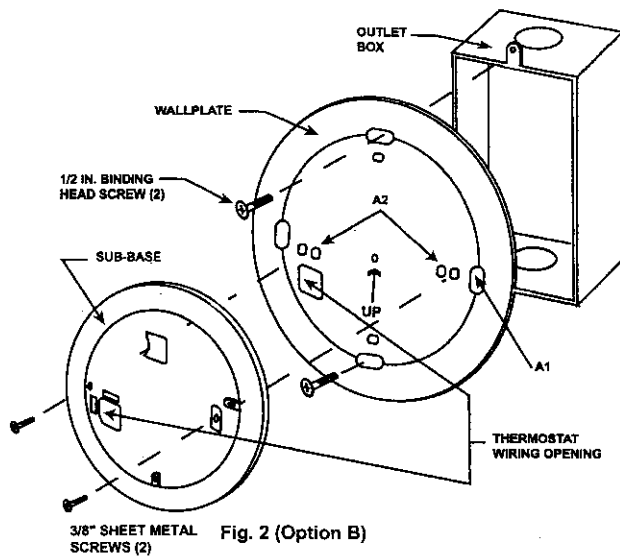


Fig. 2 (Option B)

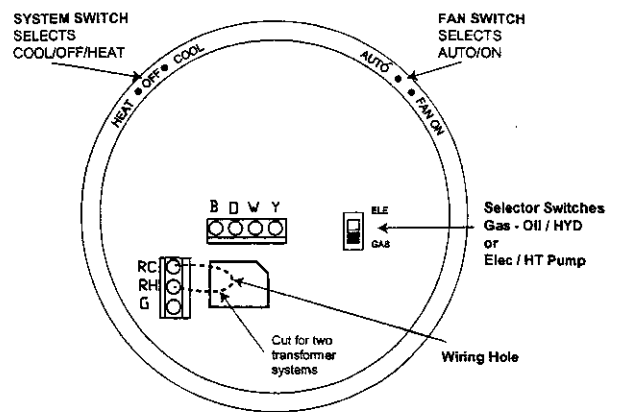


Fig 5. ES100 Subbase (front)

### ES100 Specifications

- Terminal Designations - RC,RH,G,W,Y,B,O
- Current Draw - 0.1 To 1.5 AMPS
- Operating Differential - +/- 1 degree F

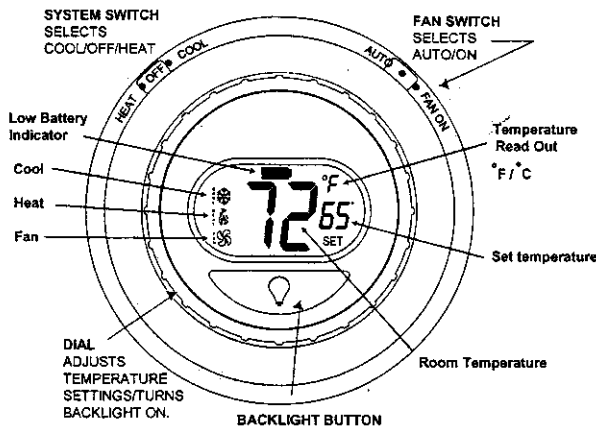


Fig 3 ES100 Thermostat (feature and operation).

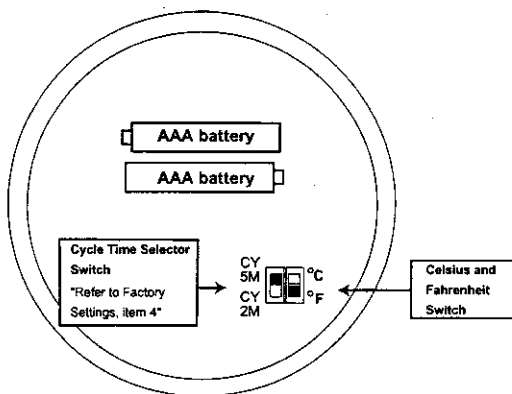


Fig 4 ES100 Thermostat (Back)

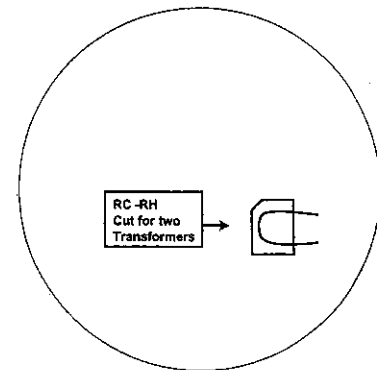





Fig 6 ES100 Subbase (Back)

### Factory Settings

- Temperature selection switch (on back of thermostat) set for degree F. (fig 4)  
The ES100 is factory set for degree F readout. To change to degree C readout simply move the selector switch located on the back of the thermostat body to the "C" position. (fig. 4)
- Application switch on front of subbase set to "G" for Gas, Oil or Hydronic systems. Move to "E" for Electric Air Conditioning and Single Stage Heat Pump systems.
- Fan switch - auto (fig. 3)
- Cycle control switch on back of thermostat set to CY5M, Max. 1 cycle per 5 minutes. Move selector down to CY2M to increase cycle rate. (fig. 4)
- Red Jumper - in place on back of subbase for standard 4 - wire system (fig. 6)

### Display


- The display provides a large readout of the actual room temperature and a smaller readout for the set point. (fig. 3)
- A flame  appears when the heat is turned on and a snowflake  appears when the cooling is on. (fig. 3)
- A fan  appears when the system is running or when the fan switch is in the on position. (fig. 3)

## Temperature setting 41 degrees F to 90 degrees F (5C to 30C)

The thermostat can be adjusted between 41 degrees F and 90 degrees F by simply rotating the soft dial clockwise to raise the set point or counterclockwise to lower the set point. The selected set point appears on the right side of the display. The room temperature is the larger readout that appears in the middle of the display. (fig. 3)

## High/Low Limits

The ES100 will automatically cutoff in the heat mode if the temperature rises above 90 degrees F, and automatically cutoff in cool mode if the temperature drops below 41 degrees.

**Caution:**  
 Low Temperature Hazard. Operating at too low of an outdoor temperature may cause compressor damage. Do not operate cooling if outdoor temperature is below 50F(10F). Refer to manufacturer's recommendations.

## Compressor Protection

If a call for cooling is made before the compressor has been off for five minutes, or if a power interruption occurs while the compressor is running, the thermostat will go into a five (5) minute delay before the compressor can be restarted. This feature will prevent damage to the compressor caused by rapid cycling.


## Set system running cycles

Use the switch marked with "CY5M" & "CY2M" (fig.2) in the middle of Setting pin switches to set system running cycles. At CY2M side: maximum 1 cycle per 2 minutes. At CY5M side: maximum 1 cycle per 5 minutes.

## Backlight and battery warning

The backlight activates when the backlight button is depressed or when the dial is rotated.

The two fresh AAA Alkaline batteries should provide well over one year of service. However, when the batteries become drained, the low battery indicator will appear on the lower right display. When this message occurs, install new batteries. Once the batteries have become too low to ensure proper operation, the system will be turned off, and the display will be cleared except for the low battery indicator on the display.

**Caution:**  
 When only the low battery icon is displayed, the thermostat will shut down, and the system will no longer operate. In this condition, there is no temperature control of the dwelling.

**Note:** If the homeowner plans to be away from the premises over 30 days, we recommend that the batteries be replaced prior to leaving.

**To replace batteries:** The batteries are located in the back of the thermostat body. (fig. 4) Follow the instructions below under "Mounting the Thermostat" to remove the thermostat body from the subbase. Remove the old batteries and replace with two (2) new AAA Alkaline batteries. Gently replace the thermostat body to the subbase by positioning the bottom clips on the thermostat into the subbase. Then align and push together the black pin receptacle on the back of the thermostat body with the white pin receptacle on the subbase. Then press and latch the top of the thermostat into the top of the subbase.

## Remove old thermostat

**Caution:** Do not remove any wiring from the existing thermostat before reading the instructions. Wiring must be labeled prior to removal.

**Important:** Turn off the power to the furnace at the main power panel or at the furnace.

## Wiring labeling

Each wire coming from the wall to the existing thermostat is connected to a terminal point on the thermostat. Each terminal point is usually marked with an alpha letter. The number of wires in the system can be as few as two (2) for heat only systems. There is often no terminal marking on the existing thermostat of two (2) wire, heat only systems. Just connect either of the wires to the Rh terminal, then connect the other wire to the W terminal to complete the circuit).

**Important:** Before disconnecting any wires, apply the self-adhesive labels provided, to the wires, since the wire colors do not always comply with the standard alpha letter terminal designations.

## Separating and attaching switching subbase with thermostat body

Hold the thermostat body and depress the top center of the thermostat with your thumb or use a screwdriver to depress the indent. Gently pull down and outward to separate the thermostat from the subbase. Determine the desired method of installation from Fig.1 or Fig.2

## Typical system wiring diagrams

**Important:** Use only 18-gauge thermostat wire. All wiring must comply with local electrical codes and ordinances. Disconnect the power supply to prevent electrical shock or damage to the thermostat or equipment.

- Fig. 7 - Heat only system
- Fig. 8 - Heat only system with fan
- Fig. 9 - Cool only system
- Fig. 10 - Heat-cool single transformer hookup
- Fig. 11 - Heat-cool with two transformers
- Fig. 13 - Single-stage heat pump

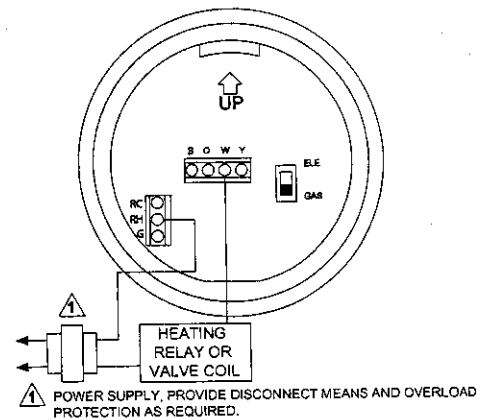


Fig 7. Typical hookup of ES100 in a heat-only system.

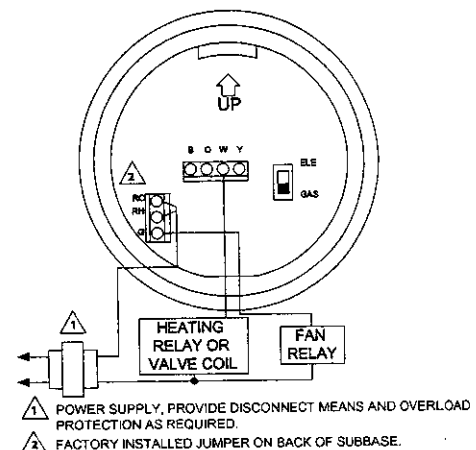


Fig 8. Typical hookup of ES100 in heat-only system with fan.

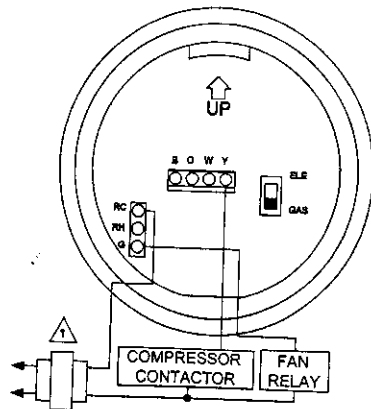


Fig 9. Typical hookup of ES100 in cool-only system with single transformer.

1 POWER SUPPLY, PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

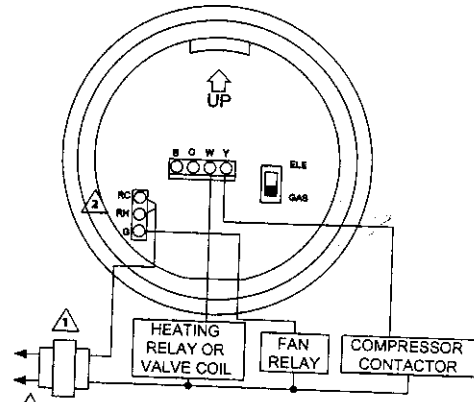


Fig 10. Typical hookup of ES100 in heat-cool system with single transformer.

1 POWER SUPPLY, PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2 FACTORY INSTALLED JUMPER -RC, RH ON THE BACK OF SUBBASE

3 USE A JUMPER WIRE (NOT SUPPLIED) TO CONNECT W TO Y.

4 USE EITHER O OR B FOR HEAT PUMP CHANGEOVER.

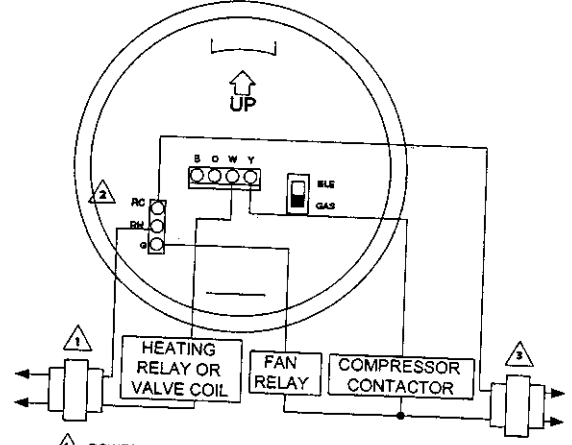


Fig 11. Typical hookup of ES100 in heat-cool system with two transformers.

1 POWER SUPPLY, PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED. (Heat Transformer)

2 CUT OR REMOVE FACTORY INSTALLED JUMPER BETWEEN RH AND RC.ON THE BACK OF SUBBASE

3 POWER SUPPLY, PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED. (Cooling Transformer)

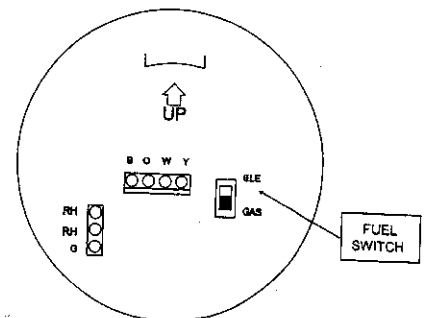


Fig 12. FUEL SWITCH SUB-BASE

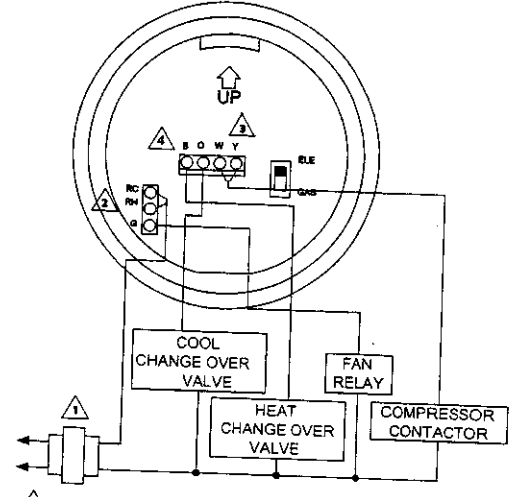


Fig 13. Typical hookup of ES100 in single-stage heat pump system.

1 POWER SUPPLY, PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2 FACTORY INSTALLED JUMPER -RC, RH ON THE BACK OF SUBBASE.

3 USE A JUMPER WIRE (NOT SUPPLIED) TO CONNECT W TO Y.

4 USE EITHER O OR B FOR HEAT PUMP CHANGEOVER.

### CHECKOUT

NOTE: Temperature setpoint range is 5C to 30C or 41F to 90F in heating and cooling.

#### Heating

1. Slide the SYSTEM switch to HEAT and the FAN switch to AUTO.
2. Raise the temperature setpoint several degrees above the room temperature.
3. A flame indicator will appear in the display and the heat should turn on.
4. Lower the temperature setpoint below the room temperature.
5. The flame indicator will disappear from the display and the heat should turn off.

#### Cooling

**CAUTION**  
 Low Temperature Hazard.  
 Operating at too low of an outdoor temperature may cause compressor damage.  
 Do not operate cooling if outdoor temperature is below 50F(10F). Refer to manufacture's recommendations.

NOTE: If a call for cooling is made before the compressor has been off for five minutes, or if a power interruption occurs while the compressor is running, the thermostat will go into a five-minute delay to protect the compressor.

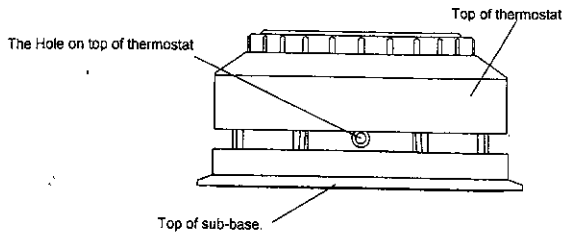
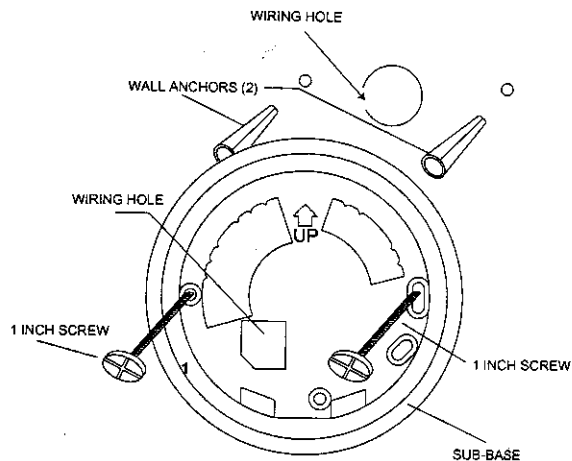
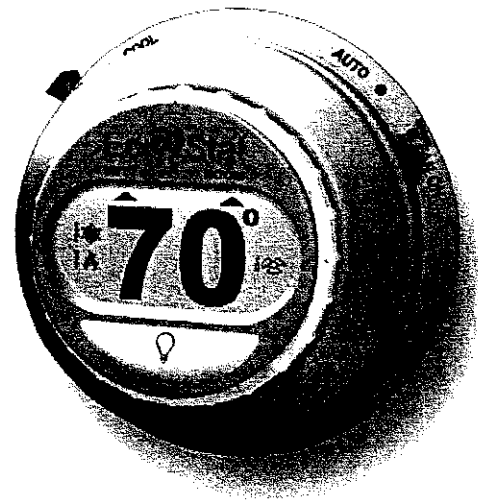
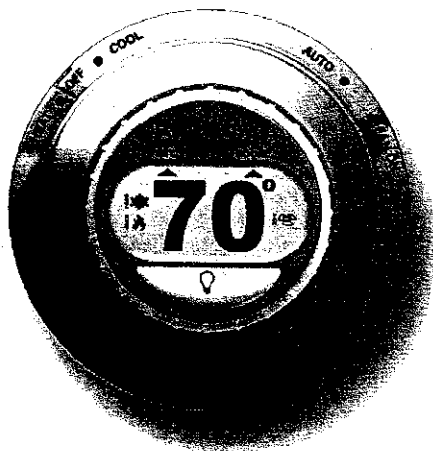


Fig 14 The top view of thermostat and sub-base



△ WHEN USING WALL ANCHORS, DRILL 3/16 IN. HOLES FOR DRY-WALL, 7/32 IN. HOLES FOR PLASTER.

Fig 1.3 (option C) Mounting sub-base to wall.



## TROUBLESHOOTING GUIDE

### Heating or cooling does not come on.

1. Make sure that the SYSTEM switch on the thermostat is set to Heat or Cool.
2. In heating, make sure the temperature setting is above the room temperature and the flame & indicator is present in the display.
3. In cooling, make sure the temperature setting is below the room temperature and the snowflake indicator is present in the display.
4. In cooling, If a call for cooling is made before the compressor has been off for five minutes, or if a power interruption occurs while the compressor is running, the thermostat will go into a five-minute delay to protect the compressor.
5. Check the system fuse or circuit breaker and replace or reset if necessary.
6. Check for air movement at the register.

### The thermostat does not have any display.

1. Check if the SYSTEM switch is OFF, turn it to HEAT or COOL.
2. For a single transformer system check if the jumper on back of the subbase is in place.
3. Check that batteries are installed properly in battery holder. Replace batteries if needed.

### Fan

1. Slide the SYSTEM switch to OFF and the FAN switch to ON. The fan should run continuously.
2. Slide the FAN switch to AUTO. The fan should turn off.