Shipping & Packing List

Package 1 of 1 contains the following:

(1) Model LZP-4 Zone Control Panel
(1) Model 88K38 Temperature Sensor
(1) Installation Instructions
(1) Owners Manual
(1) Warranty Card

Required Components (ordered separately):

24 VAC Transformer – The size of the transformer needed is determined by the total power requirements for the control panel, thermostats and dampers. The control panel and thermostat together require 10VA. The dampers require 10VA each. The size of the transformer will depend on the greatest number of dampers that could be energized at any given time. NOTE – When using power close, spring open dampers, at least one zone’s dampers will not be energized during a heating or cooling call.

<table>
<thead>
<tr>
<th>TABLE 1 – TRANSFORMERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part Number</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>10P17</td>
</tr>
<tr>
<td>10P87</td>
</tr>
<tr>
<td>12P61</td>
</tr>
<tr>
<td>83P74</td>
</tr>
</tbody>
</table>

Thermostats – see selection chart on page 5. Only 24-volt electronic thermostats with a common connection are to be used with this zoning panel. Do not use mechanical or power robbing thermostats.

Dampers – 2 or 3-wire, 24-volt dampers required. 2-wire, power closed/spring open preferred.
FIGURE 1 – LZP-4 CONTROL PANEL SCHEMATIC
**Installation**

1. **WARNING**
   - Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a qualified installer, service agency or the gas supplier.

   • Install the control panel indoors only. If the Vacation and/or Emergency Heat switches on the control panel will be used by the owner, mount in a location that is readily accessible to the owner.
   • Install the control panel in a non-condensing environment.
   • Do not install the control panel in a room where it will be exposed to elevated humidity levels such as a laundry room.
   • Do not install the control panel directly to foundation walls, HVAC equipment or ductwork, where moisture may condense on the enclosure.
   • Do not install the control panel in a location where the temperature will exceed 140°F or will drop below 32°F.

   1. Press in the cover latch on the top of the enclosure and pull open the cover (see **Figure 2**).
   2. There are six (6) keyholes on the base of the enclosure. Use the four that are visible with the circuit board in place.

**Figure 2** – Enclosure Base with Circuit Board

3. Use #8 screws (field supplied) to install the base.
   a. If space limits the use of the outside keyholes, the circuit board must be removed from the base to use the two center keyholes.

   **CAUTION**
   - Electrostatic discharge can damage the control. Touch a grounded metal object before touching the circuit board, and then only touch the circuit board on the edges when handling.

   b. Carefully remove the screws securing the circuit board to the base.
   c. Flex back the latches holding the circuit board to release.
   d. Re-install the circuit board after installing the base.
Installation (continued)

4. Install and Wire the Discharge Air Temperature Sensor

**CAUTION**
As with any mechanical equipment, personal injury can result from contact with sharp sheet metal edges. Be careful when you handle this equipment.

**CAUTION**
Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch.

The tip of the sensor must be located in a region of fully mixed supply of air before the take-offs (not in a dead air space) in order for the system to work correctly.

a. Wire discharge air temperature probe to control center using thermostat wire. Note that the temperature sensor is not polarity sensitive.

b. Be sure that the tip of the sensor is located at least 15 inches from the top of the indoor coil if using a furnace, or at least 15 inches from the top of the electric heat section if using a coil blower. Mount the sensor in the discharge plenum, 1/3 of the depth (D/3) of the plenum (D) from the front (the front is the side with the furnace or CB access doors), and centered side to side. Move the adjustable bracket along the length of the discharge air sensor to achieve proper sensor tip location (tip of sensor to be located at W ÷ 2). The sensor can be mounted from any side of the plenum, as long as the tip of the sensor is in the correct position. See Figure 3.

**IMPORTANT:** The discharge air sensor is required. If a short or open circuit is detected between the Discharge Air Sensor terminals, the control panel will only respond to Zone 1 and the dampers will stay in their normal position.

5. Install the system transformer – DO NOT USE the HVAC equipment transformer to power the control panel. Refer to the instructions provided with the transformer.

18 AWG thermostat wire minimum recommended.

**TABLE 1 – TRANSFORMERS**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Size</th>
<th>Voltage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10P17</td>
<td>40VA</td>
<td>120/208/240V-24V</td>
</tr>
<tr>
<td>10P87</td>
<td>50VA</td>
<td>120/208/240V-24V</td>
</tr>
<tr>
<td>12P61</td>
<td>75VA</td>
<td>120/208/240V-24V</td>
</tr>
<tr>
<td>83P74</td>
<td>75VA</td>
<td>4&quot; Square Electrical Box</td>
</tr>
</tbody>
</table>

The transformers listed in this chart include a plate mount for a 4" square electrical box.
6. Install the thermostats. Refer to the instructions provided with the thermostat.

18 AWG thermostat wire minimum recommended.

**Thermostat Selection Guide**

The position of the HEAT PUMP / HEAT/COOL switch, the ZONE 1 / ANY ZONE switch and the AUX. MINUTES switch (see DIP Switch Settings section) will determine the thermostat requirements for each zone. Any 24-volt electronic thermostat with a “C” (24VAC common) connection can be used. Do not use mechanical or power robbing thermostats. Power robbing thermostats can cause unintended operation – DO NOT use power robbing thermostats. Use Table 2 to determine which thermostat is required:

<table>
<thead>
<tr>
<th>CONTROL PANEL SET-UP DIP SWITCH POSITIONS</th>
<th>ZONE 1</th>
<th>ZONES 2-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any Zone, Heat Cool</td>
<td>Type</td>
<td>Terminals (see Tables 2a &amp; 2b)</td>
</tr>
<tr>
<td></td>
<td>HEAT/COOL</td>
<td>R, C, W, Y, G</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Optional: W2 and Y2</td>
</tr>
<tr>
<td>Zone 1, Heat Cool</td>
<td>HEAT/COOL</td>
<td>R, C, W, Y, G, O, B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Optional: W2 and Y2</td>
</tr>
<tr>
<td>Any Zone, Heat Pump, Aux Heat Timer &gt; 0</td>
<td>HEAT/COOL</td>
<td>R, C, W, Y, G</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Optional: W2 and Y2</td>
</tr>
<tr>
<td>Zone 1, Heat Pump</td>
<td>HEAT/COOL</td>
<td>R, C, W, Y, G, O, B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Optional: W2 and Y2</td>
</tr>
<tr>
<td>Any Zone, Heat Pump, Electric, Aux Heat Timer = 0</td>
<td>HEAT PUMP</td>
<td>R, C, W1, Y1, G, O</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Optional: Y2</td>
</tr>
<tr>
<td>Any Zone, Heat Pump, Gas, Aux Heat Timer = 0</td>
<td>HEAT PUMP</td>
<td>R, C, W1, Y1, G, O</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Optional: Y2</td>
</tr>
</tbody>
</table>
## TABLE 2a – HEAT/COOL TERMINAL DEFINITIONS

<table>
<thead>
<tr>
<th>Thermostat Terminal</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>24 VAC Hot</td>
</tr>
<tr>
<td>C</td>
<td>24 VAC Common</td>
</tr>
<tr>
<td>W</td>
<td>1st Stage Heat</td>
</tr>
<tr>
<td>W2</td>
<td>2nd Stage Heat</td>
</tr>
<tr>
<td>Y</td>
<td>1st Stage Cool</td>
</tr>
<tr>
<td>Y2</td>
<td>2nd Stage Cool</td>
</tr>
<tr>
<td>G</td>
<td>Fan</td>
</tr>
<tr>
<td>O</td>
<td>Cooling Mode</td>
</tr>
<tr>
<td>B</td>
<td>Heating Mode</td>
</tr>
</tbody>
</table>

## TABLE 2b – HEAT PUMP TERMINAL DEFINITIONS

<table>
<thead>
<tr>
<th>Thermostat Terminal</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>24 VAC Hot</td>
</tr>
<tr>
<td>C</td>
<td>24 VAC Common</td>
</tr>
<tr>
<td>Y1</td>
<td>1st Stage Compressor</td>
</tr>
<tr>
<td>Y2</td>
<td>2nd Stage Compressor</td>
</tr>
<tr>
<td>W1</td>
<td>Auxiliary Heat</td>
</tr>
<tr>
<td>G</td>
<td>Fan</td>
</tr>
<tr>
<td>O</td>
<td>Reversing Valve – Cool</td>
</tr>
<tr>
<td>B</td>
<td>Reversing Valve – Heat</td>
</tr>
</tbody>
</table>

## TABLE 2c – RECOMMENDED THERMOSTATS

1. SignatureStat 1H/1C Non-Heat Pump (51M26)
2. Elite 1H/1C Non-Heat Pump (49M55)
3. SignatureStat 2H/2C Non-Heat Pump (51M27)
4. Elite 2H/2C Non-Heat Pump (49M56)
5. SignatureStat 2H/2C Heat Pump (51M28)
6. Elite 2H/2C Heat Pump (49M57)
7. T8624D2079 2H/2C Non-Heat Pump (37L61)
8. T8611G2101 2H/1C Heat Pump (37L60)

*When using the SignatureStat, only the basic modes of dehumidification and humidification can be used.*
### TABLE 3 – CONDENSING UNIT AND FURNACE SETUP OPTIONS

<table>
<thead>
<tr>
<th>Setup¹</th>
<th>Stat Type</th>
<th>Input/ output</th>
<th>First Stage Cool</th>
<th>Second Stage Cool</th>
<th>First Stage Gas or Electric Furnace</th>
<th>Second Stage Gas or Electric Furnace</th>
<th>First Stage Compressor Heat</th>
<th>Second Stage Compressor Heat</th>
<th>Auxiliary Heat</th>
<th>Emergency Heat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat/Cool Gas Any Zone</td>
<td>Heat/Cool</td>
<td>Panel Input</td>
<td>Y+G</td>
<td>Y+2S+G or by Stage Timer</td>
<td>W</td>
<td>W+2S or by Stage Timer</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Heat/Cool Gas Zone 1</td>
<td>Heat/Cool</td>
<td>Panel Input</td>
<td>Y+O+G</td>
<td>Y+2S+O+G or by Stage Timer</td>
<td>W+B</td>
<td>W+B+2S or by Stage Timer</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Heat/Cool Electric Any Zone</td>
<td>Heat/Cool</td>
<td>Panel Input</td>
<td>Y+O+G</td>
<td>Y+2S+O+G or by Stage Timer</td>
<td>W</td>
<td>W+2S or by Stage Timer</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Heat/Cool Electric Zone 1</td>
<td>Heat/Cool</td>
<td>Panel Input</td>
<td>Y+O+G</td>
<td>Y+2S+0+G or by Stage Timer</td>
<td>W+B</td>
<td>W+B+2S or by Stage Timer</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### TABLE 4 – HEAT PUMP WITH ELECTRIC HEAT SETUP OPTIONS

<table>
<thead>
<tr>
<th>Setup¹</th>
<th>Stat Type</th>
<th>Input/ output</th>
<th>First Stage Cool</th>
<th>Second Stage Cool</th>
<th>First Stage Electric Furnace</th>
<th>Second Stage Electric Furnace</th>
<th>First Stage Compressor Heat</th>
<th>Second Stage Compressor Heat</th>
<th>Auxiliary Heat</th>
<th>Emergency Heat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Pump Electric Aux Min = 0 Any Zone</td>
<td>Heat Pump</td>
<td>Panel Input</td>
<td>Y+O+G</td>
<td>Y+2S+O+G or by Stage Timer</td>
<td>-</td>
<td>-</td>
<td>Y+G</td>
<td>Y+2S+G or by Stage Timer</td>
<td>Y+W+G (+2S if applicable)</td>
<td>W or by Emergency Switch</td>
</tr>
<tr>
<td>Heat Pump Electric Aux Min = 0 Zone 1</td>
<td>Heat/Cool</td>
<td>Panel Input</td>
<td>Y+O+G</td>
<td>Y+2S+O+G or by Stage Timer</td>
<td>-</td>
<td>-</td>
<td>Y1+B+G</td>
<td>Y1+Y2+B+G</td>
<td>Y1+W1+B+G (+Y2 if applicable)</td>
<td>W1+W2+B+G</td>
</tr>
<tr>
<td>Heat Pump Electric Aux Min = 0 Any Zone</td>
<td>Heat/Cool</td>
<td>Panel Input</td>
<td>Y+O+G</td>
<td>Y+2S+0+G or by Stage Timer</td>
<td>-</td>
<td>-</td>
<td>W+B</td>
<td>W+B+2S or by Stage Timer</td>
<td>-</td>
<td>By Emergency Switch Only</td>
</tr>
<tr>
<td>Heat Pump Electric Aux Min = 0 Zone 1</td>
<td>Heat/Cool</td>
<td>Panel Input</td>
<td>Y+O+G</td>
<td>Y+2S+0+G or by Stage Timer</td>
<td>-</td>
<td>-</td>
<td>Y1+B+G</td>
<td>Y1+Y2+B+G</td>
<td>-</td>
<td>W1+W2+B+G</td>
</tr>
<tr>
<td>Heat Pump Electric Aux Min &gt; 0 Any Zone</td>
<td>Heat/Cool</td>
<td>Panel Input</td>
<td>Y+O+G</td>
<td>Y+2S+0+G or by Stage Timer</td>
<td>-</td>
<td>-</td>
<td>W</td>
<td>W+2S or by Stage Timer</td>
<td>By Aux Timer Only</td>
<td>By Emergency Switch Only</td>
</tr>
<tr>
<td>Heat Pump Electric Aux Min &gt; 0 Zone 1</td>
<td>Heat/Cool</td>
<td>Panel Input</td>
<td>Y+O+G</td>
<td>Y+2S+0+G or by Stage Timer</td>
<td>-</td>
<td>-</td>
<td>Y1+B+G</td>
<td>Y1+Y2+B+G</td>
<td>Y1+W1+B+G (+Y2 if applicable)</td>
<td>W1+W2+B+G</td>
</tr>
</tbody>
</table>

### TABLE 5 – HEAT PUMP WITH GAS FURNACE SETUP OPTIONS

<table>
<thead>
<tr>
<th>Setup¹</th>
<th>Stat Type</th>
<th>Input/ Stat Type</th>
<th>First Stage Cool</th>
<th>Second Stage Cool</th>
<th>First Stage Gas Furnace</th>
<th>Second Stage Gas Furnace</th>
<th>First Stage Compressor Heat</th>
<th>Second Stage Compressor Heat</th>
<th>Auxiliary Heat</th>
<th>Emergency Heat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Pump Gas</td>
<td>Heat Pump</td>
<td>Panel Input</td>
<td>Y+O+G</td>
<td>Y+2S+O+G or by Stage Timer</td>
<td>Y+W+G (+2S if applicable)</td>
<td>W or by Emergency Switch</td>
<td>Y+G</td>
<td>Y+2S+G or by Stage Timer</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Aux Min = 0 Any Zone</td>
<td></td>
<td>Panel Output</td>
<td>Y1+O+G</td>
<td>Y1+Y2+O+G</td>
<td>W1+B</td>
<td>W1+W2+B</td>
<td>Y1+B+G</td>
<td>Y1+Y2+B+G</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Heat Pump Gas</td>
<td>Heat/Cool</td>
<td>Panel Input</td>
<td>Y+O+G</td>
<td>Y+2S+O+G or by Stage Timer</td>
<td>–</td>
<td>By Emergency Switch Only</td>
<td>W+B</td>
<td>W+B+2S or by Stage Timer</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Aux Min = 0 Zone 1</td>
<td></td>
<td>Panel Output</td>
<td>Y1+O+G</td>
<td>Y1+Y2+O+G</td>
<td>–</td>
<td>W1+W2+B</td>
<td>Y1+B+G</td>
<td>Y1+Y2+B+G</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Heat Pump Gas</td>
<td>Heat/Cool</td>
<td>Panel Input</td>
<td>Y+G</td>
<td>Y+2S+G or by Stage Timer</td>
<td>By Aux Timer Only</td>
<td>By Emergency Switch Only</td>
<td>W</td>
<td>W+2S or by Stage Timer</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Aux Min &gt; 0 Any Zone</td>
<td></td>
<td>Panel Output</td>
<td>Y1+O+G</td>
<td>Y1+Y2+O+G</td>
<td>W1+B</td>
<td>W1+W2+B</td>
<td>Y1+B+G</td>
<td>Y1+Y2+B+G</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Heat Pump Gas</td>
<td>Heat/Cool</td>
<td>Panel Input</td>
<td>Y1+0+G</td>
<td>Y+2S+O+G or by Stage Timer</td>
<td>By Aux Timer Only</td>
<td>By Emergency Switch Only</td>
<td>W</td>
<td>W+2S or by Stage Timer</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Aux Min &gt; 0 Zone 1</td>
<td></td>
<td>Panel Output</td>
<td>Y1+O+G</td>
<td>Y1+Y2+O+G</td>
<td>W1+B</td>
<td>W1+W2+B</td>
<td>Y1+B+G</td>
<td>Y1+Y2+B+G</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

¹ These charts apply when the # of Zones to Stage DIP switch is set to 1. If the Zone to Stage switch is set to greater than 1, the second stage conditioning will only be brought on if the number of zones calling for the same conditioning call is greater than or equal to the DIP switch setting.
Installation (continued)

7. Install the dampers. Power close, spring open dampers are preferred. Refer to the instructions provided with the damper.

18 AWG thermostat wire minimum recommended.

Bypass Damper Sizing

When fewer than the maximum number of zones are calling for heating or cooling, an excess volume of air is delivered, and because of the excess air, an excess amount of static pressure is produced as well. Zone systems often require a bypass duct to relieve this pressure. A properly sized barometric bypass damper must be installed in the bypass duct which is run between the supply and return air duct systems (see Figure 4). The barometric damper and the bypass duct must be sized to accommodate the excess static pressure from the supply duct.

The bypass tap in the return air duct must be at least 6 ft. from the furnace /air handler to ensure that the hot or cold air coming off of the plenum has time to mix with the return air before it passes through the air handler again. The provided discharge air sensor (field installed) protects the equipment from overheating or coil freeze-up by interrupting the HVAC equipment.

The bypass damper and duct should be sized to handle the excess pressure created when the smallest zone is operating alone (worst case). To size the bypass damper, subtract the total air volume capacity of the smallest zone from the total air volume of the system.

Example:
Total System air volume: 2000 cfm
Air volume of smallest zone: 600 cfm
Bypass requirement: 2000 - 600 = 1400 cfm

In this example, the bypass duct should be sized to handle the 1400 cfm excess pressure created when only the smallest zone has a demand. For bypass damper air volume capacities, see Table 6.

<table>
<thead>
<tr>
<th>Round</th>
<th>Rectangular</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 in. dia. – 400 cfm</td>
<td>12 x 8 – 1000 cfm</td>
</tr>
<tr>
<td>10 in. dia. – 750 cfm</td>
<td>12 x 10 – 1200 cfm</td>
</tr>
<tr>
<td>12 in. dia. – 1200 cfm</td>
<td>12 x 12 – 1400 cfm</td>
</tr>
<tr>
<td>14 in. dia. – 1800 cfm</td>
<td>20 x 8 – 1600 cfm</td>
</tr>
<tr>
<td>16 in. dia. – 2400 cfm</td>
<td>20 x 10 – 2000 cfm</td>
</tr>
<tr>
<td></td>
<td>20 x 12 – 3000 cfm</td>
</tr>
</tbody>
</table>

Refer to the parts and supplies catalog for information on available barometric bypass dampers.

FIGURE 4 – BYPASS DAMPER INSTALLATION
Field Wiring – Dampers

**Diagram 1 – Power Close/Spring Open Damper Wiring**

**Diagram 2 – Damper Wiring with Separate Transformer**

Field Wiring – Thermostats

**Diagram 3 – Heat/Cool Thermostat Without O and B Terminals**

**Diagram 4 – Heat/Cool Thermostat With O and B Terminals**
Field Wiring – Thermostats (continued)

**DIAGRAM 5 – HEAT PUMP THERMOSTAT**

**DIAGRAM 6 – HEAT PUMP THERMOSTAT SignatureStat (51M28) AND ELITE (49M57)**

**DIAGRAM 7 – HEAT PUMP THERMOSTAT SignatureStat (51M28) AND ELITE (49M57) DUAL FUEL**
Field Wiring – HVAC Equipment: Heat Pumps

**DIAGRAM 10 – SINGLE STAGE HEAT PUMP**

**DIAGRAM 11 – TWO-STAGE HEAT PUMP**
DIAGRAM 12 – TWO-STAGE HEAT PUMP WITH DUAL FUEL
Dip Switch Settings

# ZONES TO STAGE: If staging thermostats are not installed with the system, second stage (does not apply to auxiliary heat on heat pump applications) operation can be initiated when more than one zone is calling for conditioning. Four selections are available: one, two, three and four zones. Set to one, thermostat inputs or timed length of call control staging, for all other settings only the specified number of calling zones can trigger staging.

SWITCHES ARE SHOWN AS BLACK.

DAS SENSOR CL-45/40: This switch controls the temperature at which the cooling equipment will cut out to prevent freezing the indoor coil. For a low limit temperature of 45°F, leave the switch in the ON position (45). For a low limit temperature of 40°F, move the switch to the OFF position (CL-40).

The panel factory default is 45. Do not set this limit to 40 unless equipment issues develop requiring a lower temperature.

DAS SENSOR HT-140/160: This switch controls the temperature at which the heating equipment will cut out to prevent overheating. Set the high limit temperature that is appropriate for the equipment being used. The factory default is 160, use this option for gas heat. When using heat pumps and electric heat, set this switch to 140. For a high limit temperature of 140°F, move the switch to the ON position (140). For a high limit temperature of 160°F, leave the switch in the OFF position (HT-160).

IMPORTANT: The discharge air temperature sensor is required. If a short or open circuit is detected between the Discharge Air Sensor (DAS) terminals, the control panel will only respond to Zone 1 and the dampers will not close.

STAGE MINUTES: If staging thermostats are not installed and the # Zones to Stage is set to 1, staging can be controlled by the amount of time that any one zone must be calling for conditioning before initiating a second stage of heating or cooling (heat/cool systems) or second stage compressor (heat pump systems). Four selections are available: 0, 10, 30 and 60 minutes. Set to zero, thermostat inputs or "# of Zones Calling" control staging. SWITCHES ARE SHOWN AS BLACK.

AUX. MINUTES: With the control panel configured for ZONE 1 operation, auxiliary heat can only be controlled by time. Configured for ANY ZONE operation, auxiliary heat can be controlled by time or by individual thermostats. For thermostat control of auxiliary heat, set all AUX. MINUTES switches to the OFF position and refer to the sequence of operation sections on the following pages for details. For timed control, set the AUX. MINUTES switches to the amount of time the first and second stage (where applicable) compressors are allowed to try and satisfy a call for heating before auxiliary heat will be activated. There are four selections available: 0, 10, 30 and 60 minutes. Set to zero, auxiliary heat can be controlled by the thermostat only. SWITCHES ARE SHOWN AS BLACK.

ZONE 1/ANY ZONE: This switch determines how the control panel will control the mode of operation. In the ZONE 1 configuration, Zone 1 sets the mode of operation through the use of the O and B thermostat inputs. When the Zone 1 O terminal is energized, the system is in the cool mode and only cool calls will be satisfied. When the Zone 1 B terminal is energized, the system is in heat mode and only heat calls will be satisfied. If neither the Zone 1 O nor B terminal is energized, the system will not respond to cool or heat calls, but fan operation is unaffected. This configuration offers restricted control and is likely to be used in applications where mode control from Zone 1 is desired. In the ANY ZONE configuration, the control panel responds to each individual thermostat equally. One zone can call for cooling and another zone can call for heat. The system will respond to both needs, although it can not heat and cool at the same time. This offers control flexibility and is likely to be used in applications where the heating and cooling needs of the zones are completely independent. TALK WITH THE CUSTOMER TO DETERMINE WHICH CONTROL CONFIGURATION SHOULD BE USED. Refer to the Sequence of Operation section on the following pages for additional details.
Dip Switch Settings (continued)

HEAT PUMP or HEAT/COOL: Sets the control for the heating and cooling system equipment. If a heat pump is to be used, set the switch to the ON position. When different equipment is used for heating and cooling (i.e. furnace and air conditioner), set the switch to the OFF position.

ELECTRIC/GAS: If electric heat is to be used, set the switch to the ON position. This will turn on the fan (G output terminal) with a heat call (W1 output terminal). If the switch is left in the OFF position, it is assumed that the heating equipment will control the fan operation. For Dual Fuel Heat Pump systems, leave this switch in the GAS position.

NO PURGE / PURGE: If the NO PURGE/PURGE switch is set to PURGE, the G terminal will remain energized for a one minute purge delay following the completion of a compressor call. If the NO PURGE/PURGE switch is set to NO PURGE, the G terminal will de-energize immediately following the completion of a compressor call. The NO PURGE setting is designed for use with systems where the furnace or air handler has a built in fan purge. The following chart details the zone panel fan output and damper hold times when a heating or cooling call is satisfied:

<table>
<thead>
<tr>
<th>Dip Switch Settings</th>
<th>Mode</th>
<th>Purge</th>
<th>No Purge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat/Cool, Gas</td>
<td>Cooling</td>
<td>G</td>
<td>1 minute</td>
</tr>
<tr>
<td></td>
<td>Heating</td>
<td>No G</td>
<td>1 minute</td>
</tr>
<tr>
<td>Heat Pump, Gas</td>
<td>Compressor Cool or Heat</td>
<td>G</td>
<td>1 minute</td>
</tr>
<tr>
<td></td>
<td>Auxiliary Heat</td>
<td>No G</td>
<td>1 minute</td>
</tr>
<tr>
<td>Heat Pump or Heat/Cool, Elect.</td>
<td>Cooling</td>
<td>G</td>
<td>1 minute</td>
</tr>
<tr>
<td></td>
<td>Heating</td>
<td>G</td>
<td>1 minute</td>
</tr>
</tbody>
</table>

*The G terminal will remain energized for 1 minute.

ZONE/VAC (VACATION) SELECTOR: This switch allows the homeowner to switch from normal operation (ZONE) to a VACATION mode. In VACATION mode (switch in the ON position), Zone 1 becomes the only zone from which a call for heating or cooling is recognized. Additionally, when in Vacation mode, damper outputs do not change – they remain in the open position. The Vacation LED will illuminate when the switch is in the VACATION position.

E-HEAT SELECTOR: This feature can only be used with heat pump systems. When the EMERGENCY HEAT switch is in the ON position, any call for heat will be answered with auxiliary heat equipment outputs (W1 and W2). This feature enables the homeowner to activate the Emergency Heat mode when heat/cool thermostats are installed in all zones.

LEDs

POWER – Blinks during normal operation. Starts to blink approximately 6 seconds after power up.

HEAT – Lights when equipment heating outputs are energized (LEDs next to equipment terminals show which outputs are on). This output will flash if the heating high temperature limit has been reached. If this LED is flashing while the cooling LED is on or flashing, then this indicates an open or short circuit in the DAS.

FAN ON – Lights when equipment G terminal is energized.

VAC – Lights when ZONE/VAC switch is in VAC position.

E-HEAT – Lights when E-HEAT switch is ON.

ZONE 1 to ZONE 4 – Lights when the Normally Open (NO) damper terminal for that zone is energized (i.e. LEDs show which zones are NOT calling when the HVAC equipment is operating).
SEQUENCE OF OPERATION

When power is first applied, the green system power LED will remain off for approximately 6 seconds. After 6 seconds, this LED will begin to flash indicating that the board is working normally. **Note that immediately after the board is powered, there is a four minute minimum off delay during which only the fan output will respond.**

When operating in the Heat mode, the heating equipment will not stop operating until all heat calls have been satisfied. Any existing cooling calls will then be satisfied. Equipment operation is only interrupted if an Emergency Heat call (heat pump applications only) exists or if an opposing mode call from another zone exists for 20 minutes. Similarly, cooling calls will be satisfied until all calls for cooling end or an opposing call from another zone exists for 20 minutes. The sequence of operation is dependent on the position of the ZONE 1 or ANY ZONE switch and the HEAT PUMP or HEAT/COOL switch. A Time Delay Override (TDO) button is available on the control panel to speed up the internal timer by a factor of 60 for system checkout.

**Heat/Cool Changeover:** When a call for heating or cooling exists and an opposing call is made from another zone, a 20 minute timer is activated. If the original call is not satisfied within that 20-minute time period, the call will be interrupted, turning the equipment off and allowing for the normal fan purge cycle and minimum equipment off time. The opposing call will then be answered. After 20 minutes, if the original call still exists, the opposing call will be interrupted and the original call can once again be recognized.

**High/Low Limit Temperature:** The high/low limit temperature settings are designed to prevent the heat exchanger from overheating or the cooling coil from freezing. The temperature sensor in the supply duct senses the discharge air temperature and interrupts the heating/cooling equipment (depending on the Heat and Cool temperatures set on the control panel) before overheating/freezing occurs. When a heating/cooling call is interrupted by the high/low temperature limit, the zone control panel turns the equipment off and energizes the G terminal (if not already energized). The Heating/Cooling LED on the control panel will flash during a high/low limit temperature interrupt. Once the temperature drops/rises 10°F, the equipment is turned back on if the call for conditioning still exists, and the Heating/Cooling LED will stop flashing.

**DAMPER OPERATION**

The “NO” output will be energized and the “NC” output will be de-energized for any zone not calling for heating or cooling while the equipment output is energized and during the damper purge time delay. During equipment operation or during the damper purge time delay, should all zones stop calling for heating or cooling, the damper terminals will remain in the position they were in before all zones stopped calling.

**Damper Purge Time Delay**

When the PURGE/NO PURGE Selector is set to NO PURGE, the damper purge time delay is 3.5 minutes and begins when the equipment output(s) turn off. NO PURGE is the preferred method of purge control for Lennox furnaces and air conditioners. When the PURGE/NO PURGE Selector is set to PURGE, the damper purge time delay is one (1) minute.

**CONTINUOUS FAN OPERATION**

A call for Fan from any zone will initiate the G equipment output terminal. The normally open (NO) damper terminal at all zones not calling for continuous fan will be energized.

**HEATING AND COOLING EQUIPMENT OPERATION**

**COOLING OPERATION**

When a zone makes a call for Cooling, the Y1, G and O terminals will energize. The Y1 terminal de-energizes when (1) all zones stop calling for Cooling, (2) the call has exceeded the heat/cool changeover time limit while a heat call exists or (3) the call is interrupted by the low limit temperature setting. When the Y1 terminal is de-energized, a minimum off time delay of 4 minutes must elapse before it can be energized again. Should any call for Cooling not be satisfied in the time that is set on the STAGE dip switch bank, or should the “2S” terminal of any calling zone be energized, or should the number of zones calling for conditioning be greater or equal to the # Zones to Stage setting, the Y2 terminal will energize. For greater detail on how the system configuration DIP switch positions affect staging, see the system setup flowchart starting on page 20. When none of the conditions that initiated the Y2 terminal are present, the Y2 terminal will de-energize. Once de-energized, the Y2 terminal can not be energized again until a 4-minute minimum off time delay elapses. The O terminal remains energized until there is a Heat call.

**Fan Purge Time Delay**

If the PURGE/NO PURGE jumper is in the PURGE position, the G terminal will remain energized for one minute after the Y1 (and Y2) terminal is de-energized. If the jumper is in the NO PURGE position, the G terminal will de-energize immediately.

**IMPORTANT:** Should a short or open circuit be detected across the Discharge Air Sensor (DAS) terminals, the zone system will respond only to Zone 1 and the dampers will not energize.
SEQUENCE OF OPERATION (CONTINUED)

HEATING OPERATION – HEAT/COOL SYSTEMS

When a zone makes a call for Heat, the W1 and B output terminals will energize. The G terminal will also energize if the ELECTRIC/GAS switch is in the ELECTRIC position. The W1 terminal de-energizes when (1) all zones stop calling for Heat, (2) the call has exceeded the heat/cool changeover time limit while a cooling call exists or (3) the call is interrupted by the high limit setting. When the W1 terminal is de-energized, a minimum off time delay of 4 minutes must elapse before it can be energized again. Should any call for Heat not be satisfied in the time that is set on the STAGE dip switch bank, or should the “2S” terminal of any calling zone be energized, or the number of zones calling for conditioning matches or exceeds the # Zones to stage setting, the W2 terminal will energize in addition to the W1 terminal. For greater detail on how the system configuration DIP switch positions affect staging, see the system setup flowchart starting on page 20. When none of the conditions that initiate the W2 terminal are present, the W2 terminal will de-energize. Once de-energized, the W2 terminal has a 4 minute minimum off time. The B terminal remains energized until there is a Cool call.

Fan Purge Time Delay

If the ELECTRIC/GAS selector is in the ELECT position and the PURGE/NO PURGE selector is in the PURGE position, the G terminal will remain energized for one minute after the W terminal is de-energized. The NO PURGE setting is the preferred purge control setting for Lennox equipment. Lennox equipment includes controls which sequence the indoor fan off after a call for heat has been satisfied.

If the ELEC/GAS selector is in the GAS position, the G terminal does not turn on during purge regardless of the position of the PURGE or NO PURGE selector. Lennox furnaces will control the purge through the furnace control board cool down feature. The cool down time is often adjustable at the furnace control board up to 3.5 minutes. NO PURGE is the preferred method of purge when this zone panel is applied to Lennox equipment.

HEATING OPERATION – HEAT PUMP SYSTEMS

When a zone makes a call for Heat, the Y1, G and B output terminals will energize. The Y1 terminal de-energizes when (1) all zones stop calling for Heat, (2) the call has exceeded the heat/cool changeover time limit while a cooling call exists or (3) the call is interrupted by the high limit setting. When the Y1 terminal is de-energized, a minimum off time delay of 4 minutes must elapse before it can be energized again. Should any call for Heat not be satisfied in the time that is set on the STAGE dip switch bank, or should the “2S” terminal of any calling zone be energized, or should the number of zones calling for heat match or exceed the # Zones to Stage setting, the Y2 terminal will energize. For greater detail on how the system configuration DIP switches positions affect staging, see the system setup flowchart starting on page 20. When none of the conditions that initiate the Y2 terminal are present, the Y2 terminal will de-energize. Once de-energized, the Y2 terminal can not be energized again until a 4-minute minimum off time delay elapses. The B terminal remains energized until there is a Cool call.

AUXILIARY HEAT OPERATION – HEAT PUMP SYSTEMS

Auxiliary Heat can be controlled by time or by the thermostats.

Thermostat Control (Heat Pump thermostats in all zones): If the Y and W thermostat input terminals at any zone are energized concurrently (assuming the heat pump is on in the Heat mode of operation), the W1 equipment output terminal energizes. (NOTE: When using time controlled auxiliary heat, DO NOT USE heat pump thermostats, heat / cool thermostats must be used when staging the auxiliary heat by time.)

The W1 terminal immediately de-energizes when both of the above two conditions no longer exist.
Sequence of Operation (continued)

Fan Purge Time Delay
After the Y1, Y2 and/or W1 terminals turn off, the G terminal, if the ELEC/GAS switch is in the ELEC position, will remain on for one (1) minute if the PURGE/No Purge switch is set to Purge. The G terminal will immediately turn off, if on, when the switch set to No Purge.

Dual Fuel
Your control panel acts as a dual fuel system when the HEAT PUMP/HEAT COOL switch is set to the HEAT PUMP position and the ELECTRIC/GAS switch is set to the GAS position. The dual fuel system is set up so that when the auxiliary heat comes on, the compressor outputs (Y1 and Y2) turn off before the W1 output is turned on. The dual fuel mode effects auxiliary heat operation only.

To lock out the heat pump at low ambient conditions (below the system balance point) and service heat calls with the furnace, use the SignatureStat or Elite heat pump dual fuel compatible thermostats with outdoor temperature sensors on all thermostats (see thermostat selection guide on page 5). Each thermostat must have its own outdoor temperature sensor. To set the SignatureStat or Elite stat to use the balance points for dual fuel control, in the thermostats menu go to: menu, installer settings, system setup, add on – comp = off. When the thermostat is properly set up, it will send the appropriate signals to the LZP-4. When the outdoor temperature is below the low balance point, the Y terminal will de-energize (if energized), first stage heating demands are serviced, and second stage heating demands are serviced through the gas furnace. The W terminal will de-energize when (1) all zones stop calling for emergency heat, (2) the call has exceeded the heat/cool changeover time limit while a cooling call exists or (3) the call is interrupted by the high limit setting. When W terminal is de-energized, it has a 4 minute minimum off time if set to GAS or no minimum off time if set to ELECTRIC.

Fan Purge Time Delay
After the W1 and W2 terminals turn off, the G terminal, if the ELEC/GAS switch is in the ELEC position, will remain on for one (1) minute if the PURGE or No Purge Selector switch is set to Purge. The G terminal will immediately turn off, if on, when the switch set to No Purge.

With the ELEC/GAS switch in the GAS position, the G terminal is not turned on during purge regardless of the position of the PURGE/NO PURGE switch.

To aid in setting the system configuration DIP switches correctly, use the system setup flowcharts on the following pages.

EMERGENCY HEAT OPERATION – HEAT PUMP SYSTEMS
There is no Emergency Heat operation when the HEAT PUMP or HEAT/COOL switch is set for HEAT/COOL. When set for HEAT PUMP operation, an Emergency Heat call is recognized by a thermostat calling explicitly for Emergency Heat or by a zone calling for heat with the E-HEAT SELECTOR switch set to Emergency Heat. A thermostat can explicitly call for Emergency Heat only when the Zone 1 or Any Zone Selector switch is in the Any Zone position and the Auxiliary Heat Timer DIP switches are set to zero, which requires the use of heat pump thermostats in all zones.

When a call for Emergency Heat is recognized, the Y terminal will de-energize (if energized), after which the B and W terminals (and G terminal if set to ELECTRIC) will energize. Immediately, the W terminal will de-energize when (1) all zones stop calling for emergency heat, (2) the call has exceeded the heat/cool changeover time limit while a cooling call exists or (3) the call is interrupted by the high limit setting. When the W terminal is de-energized, it has a 4 minute minimum off time if set to GAS or no minimum off time if set to ELECTRIC.

To aid in setting the system configuration DIP switches correctly, use the system setup flowcharts on the following pages.
Set the # OF ZONES TO STAGE dip switches to desired position greater than 1.

By # of zones calling...

Will the Auxiliary Heat be brought on by the zone control AUX MINUTES Timer or by the thermostat?

- AUX. MINUTES TIMER

- Thermostat

- MUST USE AT LEAST 2H/1C HEAT PUMP THERMOSTATS
- AUX. MINUTES DIP SWITCHES MUST BE SET TO 0
- ZONE 1/ANY ZONE must be set to ANY ZONE

Heat Pump w/ Electric Heat

What type of system?

- Heat Pump & Gas furnace

See pages 22 & 23

By time

By thermostat (preferred)

Dip switches must be set to HEAT PUMP and ELECTRIC.

How do you want to stage the heat?

Set switch to any zone

No

Zone 1 sets mode?

Yes

Set switch to zone 1

Zone 1 thermostat must have an O & B terminal to use this option

When set to this option, The second stage of compressor is brought on only when the number of zones calling for the same conditioning mode meets or exceeds the # of zones to stage dip switch setting (when set greater than 1)

Auxiliary electric heat is energized when:
- The thermostat calls for Y+G+W (this results in the zone panel outputting W1 to the electric heat)
- The thermostat calls for W+G (this results in the zone panel outputting a W1+W2 to the electric heat)
- The E-heat selector switch is switched to on (this results in the zone panel outputting a W1+W2 to the electric heat)

Zone calls of opposing modes will be serviced for 20 minutes alternately until satisfied.

To use this method of staging, set the dip switches to:
- # of zones to stage: greater than 1
- DAS CL: 45
- DAS HL: 140
- Stage minutes: NO EFFECT
- Aux Minutes: Greater than 0
- Zone1/Any zone: ANY ZONE
- Heat Pump/Heat Cool: HEAT PUMP
- Electric/electric: ELECTRIC
- No Purge/Purge: your preference (NO PURGE preferred)

When set to this option, The second stage of compressor is brought on only when the number of zones calling for the same conditioning mode meets or exceeds the # of zones to stage dip switch setting (when set greater than 1)

Auxiliary electric heat is energized when:
- The AUX. MINUTES timer expires (this results in the zone panel outputting W1 to the electric heat)
- The E-heat selector switch is switched to on (this results in the zone panel outputting a W1+W2 to the electric heat)

Zone calls of opposing modes will be serviced for 20 minutes alternately until satisfied.

To use this method of staging, set the dip switches to:
- # of zones to stage: greater than 1
- DAS CL: 45
- DAS HL: 140
- Stage minutes: NO EFFECT
- Aux Minutes: Greater than 0
- Zone1/Any zone: ANY ZONE
- Heat Pump/Heat Cool: HEAT PUMP
- Electric/electric: ELECTRIC
- No Purge/Purge: your preference (NO PURGE preferred)

When set to this option, The second stage of compressor is brought on only when the number of zones calling for the same conditioning mode meets or exceeds the # of zones to stage dip switch setting (when set greater than 1)

Auxiliary electric heat is energized when:
- The AUX. MINUTES timer expires (this results in the zone panel outputting W1 to the electric heat)
- The E-heat selector switch is switched to on (this results in the zone panel outputting a W1+W2 to the electric heat)
- The AUX. MINUTES timer expires (this results in the zone panel outputting W1 to the electric heat)
- The E-heat selector switch is switched to on (this results in the zone panel outputting a W1+W2 to the electric heat)

Only zone calls that match the mode of the zone one thermostat will be serviced.

To use this method of staging, set the dip switches to:
- # of zones to stage: greater than 1
- DAS CL: 45
- DAS HL: 140
- Stage minutes: NO EFFECT
- Aux Minutes: Greater than 0
- Zone1/Any zone: ZONE 1
- Heat Pump/Heat Cool: HEAT PUMP
- Electric/electric: ELECTRIC
- No Purge/Purge: your preference (NO PURGE preferred)
System Setup Flowchart (continued)

MUST USE AT LEAST 2H/1C HEAT PUMP THERMOSTATS
SET AUX. MINUTES TO 8
SET STAGE MINUTES TO 0 or greater
SET ZONE1/ANYZONE TO ANY ZONE

This option controls the staging of the heat pump and auxiliary electric heat from the thermostat. Auxiliary heat is only brought on by thermostat demand, it will not be brought on by a zone panel timer.

Auxiliary heat is called for when:
• The thermostat calls for W+Y (this results in the zone panel outputting a W1 to the electric heat with current heat pump outputs).
• The thermostat calls for W (this results in the zone panel outputting a W1+W2 to the electric heat and discontinues heat pump use).
• The E-Heat selector switch is set to on (this results in the zone panel outputting a W1+W2 to the electric heat and discontinues heat pump use).

Second stage is called for when:
• Y+2S is energized at the zone control panel.
• The stage timer expires

Auxiliary electric heat is called for when:
• The Aux timer expires (this results in the zone panel outputting a W1 to the electric heat with current heat pump outputs).
• The E-Heat selector switch is set to on (this results in the zone panel outputting a W1+W2 to the electric heat and discontinues heat pump use).

Zone calls of opposing modes will be serviced for 20 minutes alternately until satisfied.

To use this method of staging, set the dip switches to:
# of zones to stage: 1
DAS CL: 45
DAS HL: 140
Stage minutes: 0 for stat only control, greater than 0 for desired stage delay time or stat control (whichever comes first)
Aux. Minutes: 0-Must be set to 0 for this mode of operation.
Zone1/Any zone: ANY ZONE-Must be set to ANY ZONE for this mode of operation.
Heat Pump/Heat Cool: HEAT PUMP
Electric/electric: electric
No Purge/Purge: your preference (NO PURGE preferred)

Set switch to any zone

No

Zone 1 sets mode?

Yes

NO

YES

MUST USE AT LEAST 1H/1C HEAT COOL THERMOSTATS (NOT HEAT PUMP)
SET AUX. MINUTES TO > 0
SET STAGE MINUTES TO > 0
SET ZONE1/ANYZONE TO ANY ZONE

This option controls the staging of compressor and auxiliary electric heat from the staging timer and auxiliary timer on the zone control.

When using only time to stage the heat pump and auxiliary electric heat, nothing needs to be connected to the 2S zone control terminal. This enables you to use single stage heat/cool thermostats to control multi-stage heat pump equipment.

If you chose to use a 2-stage heat/cool thermostat, the zone control panel will respond to an input to the 2S terminal by tripping on the second stage of compressor regardless of the status of the stage timer.

Second stage heat pump is called for when:
• Y+2S is energized at the zone control panel.
• The stage timer expires

Auxiliary electric heat is called for when:
• The Aux timer expires (this results in the zone panel outputting a W1 to the electric heat with current heat pump outputs).
• The E-Heat selector switch is set to on (this results in the zone panel outputting a W1+W2 to the electric heat and discontinues heat pump use).

Zone calls of opposing modes will be serviced for 20 minutes alternately until satisfied.

To use this method of staging, set the dip switches to:
# of zones to stage: 1
DAS CL: 45
DAS HL: 140
Stage minutes: greater than 0 for desired stage delay time.
Aux. Minutes: greater than 0 for desired heat pump use.
Zone1/Any zone: ANY ZONE
Heat Pump/Heat Cool: HEAT PUMP
Electric/electric: electric
No Purge/Purge: your preference (NO PURGE preferred)

MUST USE AT LEAST 1H/1C HEAT COOL THERMOSTATS (NOT HEAT PUMP)
Zone 1 Thermostat must have an O & B terminal to use this option
SET AUX. MINUTES TO > 0
SET STAGE MINUTES TO > 0
SET ZONE1/ANYZONE TO ZONE1

This option controls the staging of compressor and auxiliary electric heat from the staging timer and auxiliary timer on the zone control.

When using only time to stage the heat pump and auxiliary electric heat, nothing needs to be connected to the 2S zone control terminal. This enables you to use single stage heat/cool thermostats to control multi-stage heat pump equipment.

If you chose to use a 2-stage heat/cool thermostat, the zone control panel will respond to an input to the 2S terminal by tripping on the second stage of compressor regardless of the status of the stage timer.

Second stage heat pump is called for when:
• Y+2S is energized at the zone control panel.
• The stage timer expires

Auxiliary electric heat is called for when:
• The Aux timer expires (this results in the zone panel outputting a W1 to the electric heat with current heat pump outputs).
• The E-Heat selector switch is set to on (this results in the zone panel outputting a W1+W2 to the electric heat and discontinues heat pump use).

Zone calls that match the mode of the zone one thermostat will be serviced.

To use this method of staging, set the dip switches to:
# of zones to stage: 1
DAS CL: 45
DAS HL: 140
Stage minutes: greater than 0 for desired stage delay time.
Aux. Minutes: greater than 0 for desired heat pump use.
Zone1/Any zone: ANY ZONE
Heat Pump/Heat Cool: HEAT PUMP
Electric/electric: electric
No Purge/Purge: your preference (NO PURGE preferred)
System Setup Flowchart (continued)

When set to this option, the second stage of compressor is brought on only when the number of zones calling for the same conditioning mode meets or exceeds the # zones to stage dip switch setting (when set greater than 1)

Auxiliary Gas heat is energized when any of the below is true:
- The thermostat calls for Y+G+W (this results in the zone panel outputting W1 to the furnace)
- The thermostat calls for W+G (this results in the zone panel outputting a W1+W2 to the furnace)
- The E-heat selector switch is switched to on (this results in the zone panel outputting a W1 + W2 to the furnace)

Zone calls of opposing modes will be serviced for 20 minutes alternately until satisfied.

To use this method of staging, set the dipswitches to:
- # of zones to stage: greater than 1
  - DAS CL: 45
  - DAS HL: 140
- Stage minutes: NO EFFECT
  - Aux. Minutes: 0
  - Zone 1/Any zone: ANY ZONE

Heat Pump/Heat Cool: HEAT PUMP
Electric/Gas: GAS
No Purge/Purge: your preference (NO PURGE preferred)

When set to this option, the second stage of compressor is brought on only when the number of zones calling for the same conditioning mode meets or exceeds the # zones to stage dip switch setting (when set greater than 1)

Auxiliary Gas heat is energized when:
- The thermostat call for heat lasts longer than the AUX. MINUTES timer (this results in the zone panel outputting W1 to the furnace)
- The E-heat selector switch is switched to on (this results in the zone panel outputting a W1 + W2 to the furnace)

Zone calls of opposing modes will be serviced for 20 minutes alternately until satisfied.

To use this method of staging, set the dipswitches to:
- # of zones to stage: greater than 1
  - DAS CL: 45
  - DAS HL: 140
- Stage minutes: NO EFFECT
  - Aux. Minutes: Greater than 0
  - Zone 1/Any zone: ANY ZONE

Heat Pump/Heat Cool: HEAT PUMP
Electric/Gas: GAS
No Purge/Purge: your preference (NO PURGE preferred)

When set to this option, the second stage of compressor is brought on only when the number of zones calling for the same conditioning mode meets or exceeds the # zones to stage dip switch setting (when set greater than 1)

Auxiliary Gas heat is energized when:
- The AUX. MINUTES timer expires (this results in the zone panel outputting W1 to the furnace)
- The E-heat selector switch is switched to on (this results in the zone panel outputting a W1 + W2 to the furnace)

Only zone calls that match the mode of the zone one thermostat will be serviced.

To use this method of staging, set the dipswitches to:
- # of zones to stage: greater than 1
  - DAS CL: 45
  - DAS HL: 140
- Stage minutes: (no effect)
  - Aux. Minutes: Greater than 0
  - Zone 1/Any zone: ZONE 1

Heat Pump/Heat Cool: HEAT PUMP
Electric/Gas: GAS
No Purge/Purge: your preference (NO PURGE preferred)
System Setup Flowchart (continued)

**MUST USE AT LEAST 2H/1C HEAT PUMP THERMOSTATS**
- SET AUX. MINUTES TO 0
- SET STAGE MINUTES TO 0 or greater
- SET ZONE1/ANYZONE TO ANY ZONE

This option controls the staging of the heat pump and auxiliary gas heat from the thermostat. Auxiliary heat is only brought on by thermostat demand, it will not be brought on by a zone panel timer.

Auxiliary heat is called for when:
- The thermostat calls for W+Y (this results in the zone panel outputting a W1 to the furnace).
- The thermostat calls for W (this results in the zone panel outputting a W1+W2 to the furnace).
- The E-Heat selector switch is set to on (this results in the zone panel outputting a W1+W2 to the furnace).

Second stage is called for when:
- Y+2S is energized at the zone control panel
- The stage timer expires if it is set to greater than 0. Stage timers are active set up this way and will bring on the second stage of the compressor upon expiration if stage minutes is set to greater than 0.

Zone calls of opposing modes will be serviced for 20 minutes alternately until satisfied.

To use this method of staging, set the dipswitches to:
- # of zones to stage: 1
- DAS CL: 45
- DAS HL: 140
- Stage minutes: 0 for stat only control, greater than 0 for desired stage delay time or stat control (whichever comes first)
- Aux. Minutes: Must be set to 0 for this mode of operation.
- Zone1/Any zone: ANY ZONE
- Must be set to ANY ZONE for this mode of operation.
- Heat Pump/Heat Cool: HEAT PUMP
- Electric/Gas: GAS
- No Purge/Purge: your preference (NO PURGE preferred)

**MUST USE AT LEAST 1H/1C HEAT COOL THERMOSTATS (NOT HEAT PUMP)**
- SET AUX. MINUTES TO 0
- SET STAGE MINUTES TO 0 or greater
- SET ZONE1/ANYZONE TO ANY ZONE

This option controls the staging of compressor and auxiliary gas heat from the staging timer and auxiliary timer on the zone control. When using only time to stage the heat pump and auxiliary, nothing needs to be connected to the 2S zone control terminal. This enables you to use single stage heat/cool thermostats to control multi-stage heat pump equipment.

If you chose to use a 2-heat/2-cool thermostat, the zone control panel will respond to an input to the 2S terminal by bringing on the second stage of compressor regardless of the status of the stage timer.

Second stage heat pump is called for when:
- Y+2S is energized at the zone control panel
- The stage timer expires

Auxiliary gas heat is called for when:
- The Aux timer expires (this results in the zone panel outputting a W1 to the furnace)
- The E-Heat selector switch is set to on (this results in the zone panel outputting a W1+W2 to the furnace)

Zone calls of opposing modes will be serviced for 20 minutes alternately until satisfied.

To use this method of staging, set the dipswitches to:
- # of zones to stage: 1
- DAS CL: 45
- DAS HL: 140
- Stage minutes: greater than 0 for desired stage delay time
- Aux. Minutes: greater than 0 for desired aux gas heat delay time.
- Zone1/Any zone: ANY ZONE
- Heat Pump/Heat Cool: HEAT PUMP
- Electric/Gas: GAS
- No Purge/Purge: your preference (NO PURGE preferred)

**Set switch to zone 1**
Zone 1 Thermostat must have an O & B terminal to use this option
- SET AUX. MINUTES TO 0 or greater
- SET STAGE MINUTES TO 0 or greater
- SET ZONE1/ANYZONE TO ANY ZONE

This option controls the staging of compressor and auxiliary gas heat from the staging timer and auxiliary timer on the zone control. When using only time to stage the heat pump and auxiliary, nothing needs to be connected to the 2S zone control terminal. This enables you to use single stage heat/cool thermostats to control multi-stage heat pump equipment.

If you chose to use a 2-heat/2-cool thermostat, the zone control panel will respond to an input to the 2S terminal by bringing on the second stage of compressor regardless of the status of the stage timer.

Second stage heat pump is called for when:
- Y+2S is energized at the zone control panel
- The stage timer expires

Auxiliary gas heat is called for when:
- The Aux timer expires (this results in the zone panel outputting a W1 to the furnace)
- The E-Heat selector switch is set to on (this results in the zone panel outputting a W1+W2 to the furnace)

Zone calls of opposing modes will be serviced for 20 minutes alternately until satisfied.

To use this method of staging, set the dipswitches to:
- # of zones to stage: 1
- DAS CL: 45
- DAS HL: 140
- Stage minutes: greater than 0 for desired stage delay time
- Aux. Minutes: greater than 0 for desired aux gas heat delay time.
- Zone1/Any zone: ANY ZONE
- Heat Pump/Heat Cool: HEAT PUMP
- Electric/Gas: GAS
- No Purge/Purge: your preference (NO PURGE preferred)
System Setup Flowchart (continued)

Furnace and A/C

Dip switches must be set to HEAT/COOL and ELECTRIC or HEAT/COOL and GAS.

By # of zones calling

How do you want to stage the equipment?

By thermostat control (preferred)

Must use Heat/Cool thermostats with the same number of cooling and heating stages as the equipment to be controlled

Zone 1 sets mode?

Yes

Set switch to zone 1

Set switch to any zone

This option controls the staging of the gas furnace (or electric heat) and air-conditioner from the thermostat by the zone panel stage timer if set to greater than 0.

Second stage heat is called for when:
- W and 25 is energized at the zone control panel concurrently.
- W is energized at the zone control panel and the stage timer is expired.

Second stage cooling is called for when:
- Y+25 is energized at the zone control panel concurrently.
- Y is energized at the zone control panel and the stage timer is expired.

Zone calls of opposing modes will be serviced for 20 minutes alternately until satisfied.

To use this method of staging, set the dipswitches to:
- # of zones to stage: greater than 1
- DAS CL: 45
- DAS HL: 140
- Stage minutes: NO EFFECT
- Aux. Minutes: NO EFFECT
- Zone 1/Any zone: ANY ZONE
- Heat Pump/Heat Cool: HEAT/COOL
- Electric/electric: ELECTRIC or GAS
- (when set to electric, G will energize with a heating call, when set to gas, G will not energize with a heating call)
- No Purge/Purge: your preference (NO PURGE preferred)

When set to this option, the second stage of compressor is brought on only when the number of zones calling for the same conditioning mode meets or exceeds the # zones to stage dip switch setting (when set greater than 1)

Zone calls of opposing modes will be serviced for 20 minutes alternately until satisfied.

To use this method of staging, set the dipswitches to:
- # of zones to stage: greater than 1
- DAS CL: 45
- DAS HL: 140
- Stage minutes: NO EFFECT
- Aux. Minutes: NO EFFECT
- Zone 1/Any zone: ZONE 1
- Heat Pump/Heat Cool: HEAT/COOL
- Electric/electric: ELECTRIC or GAS
- (when set to electric, G will energize with a heating call, when set to gas, G will not energize with a heating call)
- No Purge/Purge: your preference (NO PURGE preferred)
System Setup Flowchart (continued)

This options controls the staging of compressor and gas or electric heat from the staging timer on the zone control. When using only time to stage the equipment, nothing needs to be connected to the 2S zone control terminals. This enables you to use single stage heat/cool thermostats to control multi-stage equipment.

If you chose to use a 2-heat/2-cool thermostat, the zone control panel will respond to an input to the 2S terminal by bringing on the second stage of compressor or furnace (depending whether Y or W accompanies the 2S call) regardless of the status of the stage timer.

Second stage heat is called for when:
- W and 2S is energized at the zone control panel concurrently.
- W is energized at the zone control panel and the stage timer is expired.

Second stage cooling is called for when:
- Y+2S is energized at the zone control panel concurrently.
- Y is energized at the zone control panel and the stage timer is expired.

Only zone calls that match the mode of the zone one thermostat will be serviced.

To use this method of staging, set the dip switches to:
- # of zones to stage: 1
- DAS CL: 45
- DAS HL: 140
- Stage minutes: 0 for stat only control, greater than 0 for desired stage delay time or stat control (whichever comes first)
- Aux. Minutes: NO EFFECT
- Zone1/Any zone: ZONE 1
- Heat Pump/Heat Cool: HEAT/Cool
- Electric/electric: ELECTRIC or GAS (when set to electric, G will energize with a heating call, when set to gas, G will not energize with a heating call)
- No Purge/Purge: your preference (NO PURGE preferred)

This options controls the staging of compressor and gas or electric heat from the staging timer on the zone control.

If you chose to use a 2-heat/2-cool thermostat, the zone control panel will respond to an input to the 2S terminal by bringing on the second stage of compressor or furnace (depending whether Y or W accompanies the 2S call) regardless of the status of the stage timer.

Second stage heat is called for when:
- W and 2S is energized at the zone control panel concurrently.
- W is energized at the zone control panel and the stage timer is expired.

Second stage cooling is called for when:
- Y+2S is energized at the zone control panel concurrently.
- Y is energized at the zone control panel and the stage timer is expired.

Only zone calls that match the mode of the zone one thermostat will be serviced.

To use this method of staging, set the dip switches to:
- # of zones to stage: 1
- DAS CL: 45
- DAS HL: 140
- Stage minutes: greater than 0 for desired stage delay time
- Aux. Minutes: NO EFFECT
- Zone1/Any zone: ANY ZONE
- Heat Pump/Heat Cool: HEAT/Cool
- Electric/Gas: ELECTRIC or GAS (when set to electric, G will energize with a heating call, when set to gas, G will not energize with a heating call)
- No Purge/Purge: your preference (NO PURGE preferred)
### Troubleshooting

#### DETECTING HVAC SYSTEM PROBLEMS

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Solution</th>
</tr>
</thead>
</table>
| Condensing unit receiving signal but will not turn on. | - Pressure switch open. Consult condensing unit manual for possible cause.  
- Compressor is off due to internal overload protector. Consult condensing unit manual for possible cause.  
- Condenser control board anti short cycle timer is not yet expired. Most anti short cycle timers are 5 minutes or less, if the unit does not start after 5 minutes consult the condensing unit manual for possible causes. |
| Furnace tripped the primary limit, but the zone panel does not indicate that the discharge air limit has been exceeded. | - A high static condition exists. Move the sensor further down stream to sense air that has mixed more thoroughly. Be sure not to place the sensor past the take offs. High static pressure must be corrected.  
- Bypass tap is too close to inlet of air handler. Adjust bypass tap in the return air duct so that is further away from the furnace. This will give the air more of a chance to be tempered with room return air before entering the air handler again. |
| Air handler receiving signal but will not turn on. | - Limit on furnace open. Check position of DAS in the plenum and move further down stream if possible. High static pressure must be corrected.  
- DAS limit jumper needs to be moved to a lower setting.  
- Trouble shoot air handler – see air handler documentation. |

#### DETECTING HEATING, COOLING AND FAN PROBLEMS

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Solution</th>
</tr>
</thead>
</table>
| Nothing comes on.                           | - No power to control panel. Green “Normal Flashing” LED should be blinking. If not, apply power to 24VAC inputs of control panel. Check fuse.  
- Single transformer system. Install jumper between RC and RH at HVAC Equipment outputs of control panel.  
- Interlock switch on furnace is open – close access doors. |
| Heat will not come on.                      | - Single transformer system. Install jumper between RC and RH at HVAC Equipment outputs of control panel.  
- Interlock switch on furnace is open – close access doors.  
- Thermostat is not calling for heat. Check voltage at the thermostat W input on the control panel.  
- Thermostat is power robbing or mechanical. Only use line powered electronic thermostat with a C terminal.  
- Zone panel set up to for Zone 1 mode control and Zone 1 B terminal is not energized. Check ZONE 1/ANY ZONE dip switch and check for voltage at Zone 1 B terminal.  
- An open or short in the DAS sensor has been detected. Install or repair the sensor. |
<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Heat will not come on.</td>
<td>Single transformer system. Install jumper between RC and RH at HVAC equipment outputs of control panel.</td>
</tr>
<tr>
<td></td>
<td>Thermostat is not calling for cooling. Check voltage at the thermostat Y input on the control panel.</td>
</tr>
<tr>
<td></td>
<td>Thermostat could be invoking a timed off delay.</td>
</tr>
<tr>
<td></td>
<td>Zone panel could be invoking a timed off delay.</td>
</tr>
<tr>
<td></td>
<td>Emergency Heat (E-HEAT SELECTOR) slide switch not set to ON.</td>
</tr>
<tr>
<td></td>
<td>Heat Pump thermostats used with zone panel set to ZONE 1 or AUX MINUTES set to a value other than 0 minutes. If heat pump thermostats are used in all zones, set AUX MINUTES to 0 and set ZONE 1/ANY ZONE switch to ANY ZONE. If heat pump thermostats are not used, emergency heat can only be energized with the E-HEAT SELECTOR switch set to ON.</td>
</tr>
<tr>
<td></td>
<td>Thermostat is power robbing or mechanical. Only use line powered electronic thermostat with a C terminal.</td>
</tr>
<tr>
<td></td>
<td>Zone panel set up for Zone 1 mode control and Zone 1 O terminal is not energized. Check ZONE 1/ANY ZONE dip switch and check for voltage at Zone 1 O terminal.</td>
</tr>
<tr>
<td></td>
<td>An open or short in the DAS sensor has been detected. Install or repair the sensor.</td>
</tr>
<tr>
<td>Cooling will not come on.</td>
<td>Emergency Heat (E-HEAT SELECTOR) slide switch not set to ON.</td>
</tr>
<tr>
<td></td>
<td>System requires the Discharge Air sensor. If DAS is not installed, only Zone 1 calls will be recognized and dampers will not operate. Disconnect power to the control panel, install the DAS and restore power to the control panel.</td>
</tr>
<tr>
<td></td>
<td>ZONE 1/ANY ZONE switch set to ZONE 1. This allows only heat calls when Zone 1 is in heat mode, and only cooling calls when Zone 1 is in cool mode.</td>
</tr>
<tr>
<td></td>
<td>ELEC/GAS jumper set to ELEC – change setting to GAS.</td>
</tr>
<tr>
<td></td>
<td>HVAC system has built in duct purge. Set PURGE/NO PURGE jumper on control panel to NO PURGE.</td>
</tr>
<tr>
<td></td>
<td>An open or short in the DAS sensor has been detected. Install or repair the sensor.</td>
</tr>
</tbody>
</table>
Troubleshooting (continued)

### DETECTING HEATING, COOLING AND FAN PROBLEMS (continued)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fan is running but no heat and the HEAT LED is blinking. Dampers reposition while the fan is on.</td>
<td>Discharge air temperature exceeds set limit. Allow discharge air to cool 10° below set limit and allow timed off delay to expire.</td>
</tr>
<tr>
<td>Fan is running but no cooling and the COOL LED is blinking. Dampers reposition while the fan is on.</td>
<td>Discharge air temperature dropped below set limit. Allow discharge air to warm 10° above set limit and allow timed off delay to expire.</td>
</tr>
</tbody>
</table>

### DETECTING DAMPER PROBLEMS

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damper opens when it should be closed.</td>
<td>DAS shorted or open causing the panel to only respond to zone 1 inputs while not closing any dampers.</td>
</tr>
<tr>
<td></td>
<td>Damper wired incorrectly. Spring open power close dampers should be connected between NO and C terminals.</td>
</tr>
<tr>
<td>Damper will not close.</td>
<td>DAS shorted or open causing the panel to only respond to zone 1 inputs while not closing any dampers.</td>
</tr>
<tr>
<td></td>
<td>Damper motor faulty.</td>
</tr>
</tbody>
</table>

### CHECKING THERMOSTAT VOLTAGES

Using a digital voltmeter (DVM) measure the AC voltage supplied at the R and C terminals of the Thermostat inputs on the control panel for the zone in question. This voltage should be same as the voltage supplied to the control panel 24VAC terminals. Make a call for heat, cooling or fan. Measure the voltage across the terminal that should be energized (i.e. W for heat, Y for cooling, etc.) and the C terminal. This should be the same voltage as there is between the R and C terminals. Measure the voltage across a terminal that should NOT be energized and the C terminal; this voltage should be zero.

### DISCHARGE AIR SENSOR CHECKOUT

The discharge air sensor is a temperature dependent resistor; the higher the temperature, the lower the resistance. In order to confirm the sensor is working, both sensor leads must be disconnected from the zone panel board. Using a digital voltmeter (DVM) set to read resistance, touch the leads from the sensor to the probes of the DVM. Take care not to create a parallel resistance path through your body by touching both probes with your fingers or a faulty reading will be obtained. At 77°F, the resistance of the sensor will be 10K ohm. If the sensor is cooler than 77°F, the resistance will be higher, if it is warmer, the resistance will be lower. After reading the resistance at room temperature, warm the tip of the sensor by holding it in the palm of your hand, and take another resistance reading. This reading should be noticeably lower than the room temperature reading.

<table>
<thead>
<tr>
<th>Temperature (°F)</th>
<th>Resistance (ohms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>13476</td>
</tr>
<tr>
<td>70</td>
<td>11884</td>
</tr>
<tr>
<td>75</td>
<td>10501</td>
</tr>
<tr>
<td>80</td>
<td>9298</td>
</tr>
<tr>
<td>85</td>
<td>8249</td>
</tr>
<tr>
<td>90</td>
<td>7333</td>
</tr>
</tbody>
</table>

The zone panel is well equipped to monitor the operation of the probe and determine if a failure has occurred. The probe should be considered an integral (but replaceable) part of the zone panel. The zone panel will indicate if the probe is operating improperly and needs to be replaced.