These instructions apply only to the gas control options identified on page 3.

- If the model DLV unit DOES NOT include the controls identified, these instructions are not applicable and not to be used.
- If the model DLV unit DOES include a gas heat option with control identified as applicable on page 3, these instructions must be used in conjunction with the Installation & Service Manual, Literature #LNX15-500.10 that shipped with the unit. Read those instructions thoroughly before installing or servicing this equipment.

**WARNING**

**FIRE OR EXPLOSION HAZARD**

Failure to follow safety warnings exactly could result in serious injury, death or property damage.

Be sure to read and understand the installation, operation and service instructions in this manual.

Improper installation, adjustment, alteration, service or maintenance can cause serious injury, death or property damage.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

**WHAT TO DO IF YOU SMELL GAS:**

- Do not try to light any appliance.
- Do not touch any electrical switch, do not use any phone in your building.
- Leave the building immediately.
- Immediately call your gas supplier from a phone remote from the building. Follow the gas supplier’s instructions.
- If you cannot reach your gas supplier, call the fire department.

Installation and service must be performed by a qualified installer, service agency or the gas supplier.
SPECIAL PRECAUTIONS

SPECIAL PRECAUTIONS

THE INSTALLATION AND MAINTENANCE INSTRUCTIONS IN THIS MANUAL MUST BE FOLLOWED TO PROVIDE SAFE, EFFICIENT AND TROUBLE-FREE OPERATION. IN ADDITION, PARTICULAR CARE MUST BE EXERCISED REGARDING THE SPECIAL PRECAUTIONS LISTED BELOW. FAILURE TO PROPERLY ADDRESS THESE CRITICAL AREAS COULD RESULT IN PROPERTY DAMAGE OR LOSS, PERSONAL INJURY, OR DEATH. THESE INSTRUCTIONS ARE SUBJECT TO ANY MORE RESTRICTIVE LOCAL OR NATIONAL CODES.

HAZARD INTENSITY LEVELS

1. DANGER: Indicates an imminently hazardous situation which, if not avoided, WILL result in death or serious injury.
2. WARNING: Indicates a potentially hazardous situation which, if not avoided, COULD result in death or serious injury.
3. CAUTION: Indicates a potentially hazardous situation which, if not avoided, MAY result in minor or moderate injury.
4. IMPORTANT: Indicates a situation which, if not avoided, MAY result in a potential safety concern.

⚠️ DANGER

Appliances must not be installed where they may be exposed to a potentially explosive or flammable atmosphere.

⚠️ WARNING

1. Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death, and could cause exposure to substances which have been determined by various state agencies to cause cancer, birth defects or other reproductive harm. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.
2. Disconnect power supply before making wiring connections or working on this equipment. Follow all applicable safety procedures to prevent accidental power up. Failure to do so can result in injury or death from electrical shock or moving parts and may cause equipment damage.
3. For units equipped for dual power supply sources, both sources of power must be disconnected to prevent electrical shock and equipment damage.
4. All field gas piping must be pressure/leak tested prior to operation. Never use an open flame. Use a soap solution or equivalent for testing.
5. Gas pressure to appliance controls must never exceed 14" W.C. (1/2 psi).
6. To reduce the opportunity for condensation, the minimum sea level gas input to the appliance, as indicated on the serial plate, must not be less than 5% below the rated input, or 5% below the minimum rated input of dual rated units.
7. When the dead front disconnect switch(es) (for main unit and/or powered convenience outlet option) is in the "OFF" position, supply power remains energized at the line (supply) side of the dead front disconnect switch(es). The switch body is located inside of another junction box to protect against contact with the live wiring. The junction box must not be disassembled unless the main power supply from the building to the unit is de-energized.

⚠️ WARNING

1. When servicing or repairing this equipment, use only factory-approved service replacement parts. Refer to the rating plate on the appliance for complete appliance model number, serial number, and company address. Any substitution of parts or controls not approved by the factory will be at the owner's risk.

⚠️ CAUTION

1. As with any mechanical equipment, personal injury can result from contact with sharp sheet metal edges. Be careful when you handle this equipment.
2. Appliances are designed for outdoor installation only. DO NOT LOCATE THIS APPLIANCE INDOORS.
3. Purging of air from gas lines should be performed as described in ANSI Z223.1 - latest edition "National Fuel Gas Code", or in Canada in CAN/CGA-B149 codes.
4. When servicing the unit, some components may be hot enough to cause pain or injury. Allow time for cooling of hot components before servicing.
5. Do not reuse any mechanical or electrical component which has been wet. Such components must be replaced.

⚠️ IMPORTANT

1. These instructions must also be used in conjunction with the Installation and Service Manual originally shipped with the model DLV unit, literature #LNX15-500.10, in addition to any other accompanying component supplier literature.
2. To prevent premature heat exchanger failure, do not locate ANY gas-fired appliances in areas where corrosive vapors (i.e. chlorinated, halogenated or acid) are present in the atmosphere.
3. To prevent premature heat exchanger failure, the input to the appliance, as indicated on the serial plate, must not exceed the rated input by more than 5%.
4. To prevent premature heat exchanger failure, check to be sure the blower has been set to deliver the proper airflow for the application. Refer to the Blower Adjustments section in LNX15-500.10.
5. Start-up and adjustment procedures must be performed by a qualified service agency.
GAS HEAT OPTION MODEL IDENTIFICATION

Gas Heating Option Identification

These instructions are supplemental to those in the main Installation and Service Manual, literature #LNX15-500.10. These supplemental instructions are only used for units that meet the following conditions:

- Digit 17 of the DLV unit model number (not the gas heat option model number) is 2, 3, 5, or 6 indicating the gas heat option. Example: DLV20CD1A1A8S16D2KHDNNNN (Digit 17=2)
- Digit 11 of the gas heat option furnace model number (not the model DLV unit model number) is 6, 9, A, B, C, or D. Example: FMP0600SSNH0A (Digit 11=9)

Refer to the Installation and Service Manual, Literature #LNX15-500.10 for full model nomenclature descriptions.

Identify the Gas Control Type

Before you begin, review the furnace serial plate to determine the model installed. The serial plate is located on the right hand access door for the furnace section. A sample is shown in Figure 3.1. Note that the furnace serial plate is separate from the unit (model DLV) serial plate.

Figure 3.1

Serial Plate Example (D-Cabinet Heat Option Shown)

Digit 11 of the furnace model number denotes the type of gas control used. These are defined below:

For B-Cabinet (DLV Model Digit 6) Units Only:
The unit includes one heat exchanger with control as follows, indicated by Digit 11:

- 6 - A single manifold with Beckett advanced modulation control which varies the manifold pressure and power exhauster speed based on demand. High turn down and more consistent efficiency are possible with this control.
- B - A split manifold equipped with Beckett advanced modulation control on part of the manifold which varies the manifold pressure and fixed input on the rest of the manifold. This system varies power exhauster speed based on input. Highest possible turn down and more consistent efficiency are possible with this control.

For C and D-Cabinet with rating of 800MBH and lower:
The unit includes two heat exchangers with control as follows, indicated by Digit 11:

- 9 - One heat exchanger equipped with a single manifold with advanced Beckett modulation control and the other equipped with two stage control. The second heat exchanger is controlled by the Carel controller and will switch from high and low input and off based on demand.
- C - One heat exchanger equipped with a split manifold with advanced Beckett modulation control and the other equipped with two stage control. The second heat exchanger is controlled by the Carel controller and will switch from high and low and off based on demand.

For D-Cabinet with rating of 900MBH and higher:
The unit includes four heat exchangers with control as follows, indicated by Digit 11:

- A - One heat exchanger equipped with advanced Beckett modulation control and the others equipped with single stage control. Those heat exchangers are controlled by the Carel controller and will turn on and off based on demand.
- D - One heat exchanger equipped with a split manifold with advanced Beckett modulation control and the others equipped with single stage control. Those heat exchangers are controlled by the Carel controller and will turn on and off based on demand.

Refer to the following flowchart to determine next steps:
GAS HEAT START-UP PROCEDURE

Gas Heating Option Gas Pressure Setup

The Gas Heating Option requires gas pressure to be measured and adjusted as required at several points on the unit. The instructions below must be followed and completed after all other steps have been completed through page 22 of Installation and Service Manual, literature #LNX15-500.10:

Carel Controller Settings

Setup of the gas heating option for units with furnace model number digit 11=D, E, F requires certain settings be entered in the main unit Carel controller to enable firing furnaces individually or together for testing. Refer to the following instructions when necessary (refer to the Controls Manual that shipped with the unit for further information):

1. From the home screen press the “Prg” button (center left button) to reach “Main Menu”. Refer to Figure 4.1 for location of buttons.

Figure 4.1 - Carel Controller Buttons and Screen

2. Arrow up or down to reach the “Service” menu and hit “Enter” (center right button). Arrow up or down to “g. Manual Management” and press “Enter”.

3. At the password prompt use the arrow and “Enter” buttons to enter the password 1500.

4. If the unit is configured with a 2-position type damper (unit model digit 7=D, E, or F) and the damper is closed, arrow up to “d. Relay Outputs” and press “Enter”. Use the arrow keys to find “OA Damper Open” and press “Enter”. The cursor should be on the “Manual Relay 05” line, set “Manual Relay 05” to “Yes” and press “Enter”. The cursor should now be on the “Manual Position” line. Set “Manual Position” to “On” and press “Enter”.

5. Arrow up to “e. Analog Outputs” and press “Enter”. If the main fan is operating, skip to step 8.

6. If the fan is not running, use the arrow buttons to find “Supply Fan” and press “Enter”.


8. The cursor should now be on the “Manual Value:” line. Set the value to 10.0vDC for full speed fan operation and press “Enter”. Note that depending on unit configuration, the maximum value delivered to the VFD may be displayed at less than 10.0vDC. This is normal.

9. Use the arrow buttons to find “Analog Outputs” with the title “Furnace 1 Signal” on the next line below. Press “Enter”.

10. The cursor should go to the line “Manual Y4”. Use the arrow buttons to set the value to “On” and press “Enter”.

11. The cursor should now be in the “Manual Value” line. Press the down arrow button once to set the values to 10.0vDC for high fire. Values between 10.0vDC and 2.0vDC can be used to check modulation, if desired. If the unit is operating and this value is set to 1.5vDC or lower, the burners will turn off. If the unit is not operating, this value must be set above 2.0vDC to fire.

12. Hit “Esc” to return to the “Manual Management” menu.

13. Use the arrow buttons to select “d. Relay Outputs” and press “Enter”.

14. If the unit fan is running skip to step 15. Otherwise use the arrow buttons to find “Relay Output” with the label “Supply Fan” and press “Enter”.

15. Use the arrow buttons to set the “Manual Relay 08” to “Yes”, press “Enter” and then use the arrow buttons again to set “Manual Position” to “Yes”. At this point the supply air fan should start. Press “Esc”.

16. To operate the modulated furnace section use the arrow buttons to find “Relay Output” with the label “Furnace 1 Ignition” to start the modulated furnace and press “Enter”.

17. Use the arrow buttons to set the “Manual Relay 09” to “Yes”, press “Enter” and then use the arrow buttons again to set “Manual Position” to Yes. At this point, furnace 1 should initiate a start sequence even without pressing “Enter”. Changing “Manual Position” to “Yes” or “No” at this point can be used to initiate and end furnace 1 operation as desired. Once furnace 1 is fired, you can begin to program the main valve and modulating valve high and low settings as needed. You can also press “Esc” and go back to “e. Analog Outputs” shown in steps 8-11 above to test various demand points. When you have completed setting and testing furnace 1, set manual position to “Off”. The furnaces will operate for 5 minutes in this condition before the control resets “Manual Relay” to “No” and turns off the furnace. If a longer run time is needed, reset the “Manual Relay” and “Manual Position” to “Yes” to restart.

18. **Furnace Digit 11=9 or C Only (dual furnaces with a two stage furnace section):** For units with dual furnaces, the “Relay Outputs” list will have one screen titled “Furnace 2 Stage 2” that controls high fire and “Furnace 2 Stage 1” that controls low fire. Each is controlled by setting the “Manual Relay” and “Manual Position” to “Yes”, similar to step 14 above. Note: Stage 1 “Manual Relay” and “Manual Position” must be set to “Yes” for the furnace to fire. The furnace will always fire on high input but will step to low after thirty seconds of burner operation. To operate at high fire continuously, “Furnace 2 Stage 2”, “Manual Relay” and “Manual Position” must also be set to “Yes”. This is accomplished by setting “Furnace 2 Stage 2”, “Manual Relay” and “Manual Position” must also be set to “Yes”. After setting “Manual Position” to “Yes”, press “Enter” and you will be able to navigate to “Furnace 2 Stage 2” using the arrow buttons and again set “Manual Relay” and “Manual Position” to “Yes”. The furnaces will operate for 5 minutes at a time in this condition before the control resets “Manual Relay” to “No” and turns off the furnace. If a longer run time...
is needed, reset the “Manual Relay” and “Manual Position” to “Yes” to restart.

19. Furnace Digit 11=A or D Only (quad furnaces): For units with four furnace sections, furnace 1 is modulating. This furnace is controlled as described in 13 and 14 above. Furnaces 2, 3 and 4 are single stage furnaces controlled by “Relay Outputs” labeled “Furnace 2” through “Furnace 4”. Select the desired furnace and set both the “Manual Relay” and “Manual Position” to “Yes” to fire each furnace section. To turn off a furnace, set “Manual Relay” to “No”. As with the other furnaces described above, the furnaces will operate for 5 minutes at a time in this condition before the control resets “Manual Relay” to “No” and turns off the furnace. If a longer run time is needed, reset the “Manual Relay” and “Manual Position” to “Yes” to restart.

20. After testing is completed, press “Esc” multiple times until the control is back to the main SA (Supply Air) temp screen. Use the arrow buttons to navigate to the “Unit Status M99” screen. Press “Enter” and set “Reset Unit To Auto Mode:” to “Yes.” This will clear any changes made in the Carel program for manual operation and will return the unit to normal operation.

Check/Adjust Pressure Upstream of Unit
With the field installed manual gas shut-off valve in the “OFF” position, recheck the gas supply pressure at the field installed manual shut-off valve. The inlet pressure should be 6”-7” W.C. on natural gas (11”-14” W.C. on propane (LP) gas), while all burners are operating, but never more than 14” W.C when the burners are off. If inlet pressure is too high, install an additional pressure regulator upstream of the combination gas control.

Modulated Furnace/Manifold Section
Gas pressure must be checked and adjusted as necessary, at both the combination gas valve (A) and at the manifold (B) to ensure appropriate gas pressures.

A. Check/Adjust Pressure at Combination Gas Valve
The following steps are required to check/adjust the manifold pressure on the combination gas valve:

1. Open the field installed manual gas shut-off valve and set the combination gas control valve to the “ON” position. Note for C- and D-Cabinet sized units and units equipped with split manifolds, the Gas Heating Option consists of one or more heating sections that are not modulated. For this step, only one combination gas valve on the modulated furnace or manifold section is to be set to the “ON” position.

2. Enable the unit controls. The LED display on the furnace control board (Figure 5.1) will briefly display the heat exchanger size being modulated. Refer to Table 5.1 Verify that the model readout is correct for the unit being started.

3. Ensure that the supply fan blower is operating at the proper airflow and adjust the Carel controller as described in “Carel Controller Settings” to create a call for heat.

4. Check the ignition control and gas valve for electrical operation.

5. Check to make sure that the main gas valve opens while the supply fan blower is operating.

6. Check the gas pressure at the INLET to the combination gas control valve (refer to figures on pages 10 through 15) and adjust as needed to maintain 6”-7” W.C for Natural Gas (11-14” W.C. for Propane) while the burners are operating at high fire. This pressure is required for proper ignition and to attain the rated input of the unit. If this pressure cannot be obtained, the gas supply is undersized and needs to be corrected or the gas supplier must be contacted.

7. Check gas pressure on the OUTLET of the combination gas control valve (refer to figures on pages 10 through 15) when the burners are functioning. This should be set to 4.0-4.5” W.C for Natural Gas (10.5-11” W.C. for Propane) for the modulated furnace or manifold section (see gas valve instruction sheet for location.)
GAS HEAT START-UP PROCEDURE

8. Check to ensure that gas controls sequence properly (refer to the Controls Manual for additional information).

9. Reinstall the pressure fittings and move to the modulated section.

B. Check/Adjust Pressure at the Modulated HX/Manifold
The following steps are required to check/adjust the manifold pressure on modulated heat exchanger/manifold sections:

1. Move the field installed manual shut-off valve to the "OFF" position.

2. Remove the 1/8" pipe plug in the pipe tee of the manifold or in the manifold itself for split manifold units of the modulated furnace.

3. Attach a digital or "U" tube type water manometer which is at least 12" high and capable of reading to 0.1" W.C.

4. The Maxitrol EXA modulating valve series (refer to figures on pages 10 through 15) has a cover secured with two screws that must be removed. Once removed, there are a bank of (3) DIP switches, two buttons, and a communication LED for the user interface as shown in Figure 6.1.

5. Verify that the DIP switches are properly set to the settings shown in Figure 6.1.

Figure 6.1 - Maxitrol EXA Modulating Valve

6. Move the field installed manual gas shut-off valve to the "ON" position.

7. Adjust the High Fire Setting as follows:
   a. Enable the unit controls.
   b. Press and hold Button #1 on the modulating valve until the LED lights solid red, then release.
   c. With the valve now in the high fire setting mode, confirm or adjust the high fire manifold pressure to be 3.5" W.C. for Natural Gas (10.0" W.C. for Propane). If the pressure needs to be adjusted, press or hold Button #1 to increase gas flow and press or hold Button #2 to decrease gas flow.
   d. If 3.5" W.C. for Natural Gas (10.0" W.C. for Propane) cannot be attained, recheck the inlet gas pressure as described previously. After addressing any issues, if 3.5" W.C. for Natural Gas (10.0" W.C. for Propane) still cannot be attained, step the valve closed using button #2 to the point where manifold pressure begins to be impacted. If the pressure at that point is less than 3.3" W.C. for Natural Gas (9.5" W.C. for Propane), corrective action is required.
   e. Save the setting by simultaneously holding Buttons #1 and #2 until the LED turns OFF. If this is not performed within 5 minutes, the control will default to the previously saved settings and return to normal operating mode.

8. Adjust the Low Fire Setting as follows:
   a. Press and hold Button #2 on the modulating valve until the LED light blinks red, then release.
   b. With the valve now in the low fire setting mode, confirm or adjust the low fire manifold pressure to be no less than the minimum shown on the furnace serial plate in the box called “Min. Manifold Pressure”. If the pressure needs to be adjusted, press or hold Button #1 to increase gas flow and Button #2 to decrease gas flow. It is best to press and release button #2 to single step the valve to the minimum manifold pressure. Holding the button is likely to cause the valve to close too far and lose flame. Save the setting by simultaneously holding buttons #1 and #2 until the LED turns OFF. If this is not performed within 5 minutes, the control will default to the previously saved settings and return to normal operating mode.

9. For furnace models with Digit 11=6 or higher, if no errors or alerts were recorded by the board (these will be on the 3 LED displays as an “A” or “E” followed by a number), proceed to the next step. If any alerts or errors were logged by the board, refer to the “Clearing Furnace Control Board Error Codes” section on the next page to clear the errors.

10. For furnace models with Digit 11=6 or higher, verify the Carel control is communicating properly with the furnace control board and modulating valve by adjusting the demand or “Manual Value” as described in item 10 of the “Carel Controller Settings” section on page 4 from 10.0 vDC to 2.0vDC with the up and down buttons.
   a. The high fire manifold pressure may be in the range of 3.3" W.C to 3.5" W.C. for Natural Gas (9.5 to 10.0" W.C. for Propane) at the 10.0 Fire Rate Input setting.
   b. The low fire manifold pressure must not go below the minimum value specified on the serial plate of the furnace section at the 2.0vDC “Manual Value” demand setting. If the manifold pressure drops below the minimum specified value or flame is lost, repeat the “Check/Adjust Pressure at Combination Gas Valve” section on page 5 and then repeat the “Low Fire Setting” sequence described above.

11. Once the setting of the modulating valve has been completed, replace the valve cover that was removed earlier.

12. Move the field installed manual shut-off valve to the “OFF” position, remove the manometer, and replace the 1/8" pipe plug.

13. After the plug is in place, move the field installed manual shut-off valve to the “ON” position and recheck all pipe plugs for gas leaks with soap solution.
GAS HEAT START-UP PROCEDURE

Single and Two Stage Furnace / Manifold Section
(applies to C- and D-Cabinet units only)

The following steps are required to check/adjust the manifold pressure on the combination gas valve for staged furnaces (multiple furnace units only).

1. With supply pressure set as described in the sections above, manually set the unit demand at 10.0 vDC for the furnace being tested as described in the "Carel Controller Settings" section on page 4.

2. On split manifold units (furnace model digit 11=B, C, or D), verify that the combination valve on fixed input portion of the manifold supplies a pressure of 3.5 +/- 0.2"WC for Natural Gas (10.0 +/- 0.2"WC for LP) on the outlet of the valve when all burners are operating.

3. On heat exchangers with two stage controls (C and D-Cabinet units up to 800MBH):
   a. Reduce the heat demand until the non-modulated furnace is operating at low input. This will typically occur between 50 and 75% demand. The easiest way is to drive Furnace 2 to low fire by following step 17 on page 4.
   b. Verify that the combination valve supplies a manifold pressure of 1.0 +/- 0.2"WC for Natural Gas (2.5 +/- 0.2"WC for LP) on the outlet of the valve when all burners are operating at reduced demand.

4. On heat exchangers with single stage controls (D-Cabinet units 900MBH and larger), verify that the combination valve supplies a manifold pressure of 3.5 +/- 0.2"WC for Natural Gas (10.0 +/- 0.2"WC for LP) on the outlet of the valve when all burners are operating at full demand.

5. Once the setting of the valve(s) has been completed, move the field installed manual shut-off valve to the "OFF" position, remove the manometer, and replace the 1/8" pipe plug.

6. After the plug is in place, move the field installed manual shut-off valve to the "ON" position and recheck all pipe plugs for gas leaks with soap solution.

Clearing Furnace Control Board Error Codes

1. Error codes on the primary control board (VB1285) can be viewed by pressing the UP/MODE button for at least 4 seconds until the LED display changes to display "Lo9" and release the button. Refer to Figure 5.1 for location of buttons and LED display and Table 8.1 for a listing of error codes.

2. Briefly press the UP/MODE button again to review the error codes. If there are no alerts or error codes currently stored in the history log, the display will instead revert back to the original normal display mode. If any error codes are currently stored in the history log, then they will be displayed beginning with the most recently recorded. The UP/MODE and DN/SELECT buttons will navigate through the log.

3. To clear the error codes from memory, press the DN/SELECT button until "Clr" is displayed. Press and hold the DN/SELECT button for 4 seconds to clear the memory. The board will then revert to normal operation.

4. To exit the History Log without clearing the log and revert to normal operation depress the UP/MODE button for 4 seconds.

5. On the secondary staged control boards (United Technologies), refer to the LED indicator and Tables 9.1 and 9.2 for a listing of error codes.

Final Check

1. Operate furnace (all furnaces for units with multiple heat exchangers) at high fire and verify that gas pressure to the INLET of the combination gas control valve is maintained at 6"-7" W.C. on natural gas (11"-14" W.C. on propane (LP) gas). If the pressure cannot be maintained while operating at high fire, the gas supply system is undersized and must be corrected and the entire check and adjustment of gas pressures section must be repeated.

2. Once all gas pressures have been checked and are at the proper settings, shut the unit down and move the field installed manual shut-off value to the "OFF" position.

3. Remove all testing equipment and replace any hardware (plugs, covers, etc.)

4. After the plug is in place, move the field installed manual shut-off valve to the "ON" position and recheck all pipe plugs for gas leaks with soap solution.

5. Close the unit access doors.

Table 8.1 - Primary Furnace Control Board (VB1285) Error Codes

(Applies to all units with Gas Heat Option furnace model number Digit 11= 6, 9, A, B, C, or D)

<table>
<thead>
<tr>
<th>Display Code</th>
<th>Code Type</th>
<th>Description</th>
<th>Additional Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>888</td>
<td>10s L/O</td>
<td>Board Failure (Up to 10 sec @ power up)</td>
<td>Verify 24 VAC signal input at connector J6.</td>
</tr>
<tr>
<td>Off</td>
<td>Status</td>
<td>UP Mode: Burner state = Off</td>
<td></td>
</tr>
<tr>
<td>Pur</td>
<td>Status</td>
<td>UP Mode: Burner state = Purge</td>
<td></td>
</tr>
<tr>
<td>Ign</td>
<td>Status</td>
<td>UP Mode: Burner state = Ignition</td>
<td>Normal Operation</td>
</tr>
<tr>
<td>HEA</td>
<td>Status</td>
<td>UP Mode: Burner state = Warmup</td>
<td></td>
</tr>
<tr>
<td>Run</td>
<td>Status</td>
<td>UP Mode: Burner state = Run</td>
<td></td>
</tr>
<tr>
<td>rEt</td>
<td>Status</td>
<td>UP Mode: Burner state = Retry (with A01 or A02)</td>
<td>Retry delay following either a failed ignition or a flame loss.</td>
</tr>
<tr>
<td>A01</td>
<td>Alert</td>
<td>Failed ignition attempt</td>
<td></td>
</tr>
<tr>
<td>A02</td>
<td>Alert</td>
<td>Lost Flame</td>
<td>Ignition was successful but then flame disappeared.</td>
</tr>
<tr>
<td>A03</td>
<td>Alert</td>
<td>Insufficient Combustion Air</td>
<td>Blocked vent with modulator position de-rated by &gt;20% from Fire Rate Input (demand) setting.</td>
</tr>
<tr>
<td>A04</td>
<td>Alert</td>
<td>Limited Low Fire (due to Lost Flame Auto-Adaptation)</td>
<td>Flame loss at low fire results in an auto-adjustment limit of the burner turndown by adjusting the minimum modulation voltage during the rest of the current cycle or until a CPU reset.</td>
</tr>
<tr>
<td>A05</td>
<td>Alert</td>
<td>Weak Flame Signal</td>
<td>Flame presence signal of less than 1.5μA indicates an aged flame rod.</td>
</tr>
<tr>
<td>A07</td>
<td>Alert</td>
<td>Loss of Inducer Motor Control</td>
<td>The Air Pressure is not modulating down at minimum inducer drive.</td>
</tr>
<tr>
<td>A08</td>
<td>Alert</td>
<td>Air Sensor Null Pressure Check out-of-tolerance</td>
<td>The Air Pressure sensor zero reading appears to be out-of-tolerance.</td>
</tr>
<tr>
<td>A11</td>
<td>Alert</td>
<td>Failed Ignition – Split Manifold</td>
<td>Failed Ignition, Split manifold burner, retries exhausted.</td>
</tr>
<tr>
<td>A15</td>
<td>Alert</td>
<td>Weak Flame Signal – split manifold</td>
<td>Weak Flame Signal, one or more split-manifold staged burners.</td>
</tr>
<tr>
<td>E01</td>
<td>1hr L/O</td>
<td>Failed Ignition</td>
<td>Four failed ignition attempts have occurred.</td>
</tr>
<tr>
<td>E02</td>
<td>10s L/O</td>
<td>Primary Limit Failure</td>
<td>Verify Primary Limit input at connector J8 and fuse at F1.</td>
</tr>
<tr>
<td>E03</td>
<td>10s L/O</td>
<td>Modulation Valve Failure</td>
<td>The Valve Actuator did not reach a Park or Full On position.</td>
</tr>
<tr>
<td>E04</td>
<td>30s L/O</td>
<td>Air Sensor Failure - Pressure Reading Low</td>
<td>Includes air switch failure to open during pre-purge switch check, includes insufficient air lockout due to blocked vent.</td>
</tr>
<tr>
<td>E05</td>
<td>30s L/O</td>
<td>Air Sensor Failure - Pressure Reading High</td>
<td>Includes air switch failure to close during pre-purge switch check.</td>
</tr>
<tr>
<td>E08</td>
<td>10s L/O</td>
<td>Improper Flame</td>
<td></td>
</tr>
<tr>
<td>E09</td>
<td></td>
<td>No R-W Enable</td>
<td>An R-W open circuit is preventing the control from operating on a non-zero Firing Rate Demand or Firing Rate Input.</td>
</tr>
<tr>
<td>E13</td>
<td>10s L/O</td>
<td>Open Fuse</td>
<td></td>
</tr>
<tr>
<td>Eld</td>
<td>10s L/O</td>
<td>Invalid I.D. Plug Installed</td>
<td></td>
</tr>
</tbody>
</table>

To clear furnace control board error codes, refer to the section “Clearing Furnace Control Board Error Codes” on page 7.
FURNACE CONTROLLER ERROR CODES

Table 9.1 - Staged Furnace Control Boards (United Technologies Two Stage Control) Error Codes
(Applies only to C- and D-Cabinet Units with Gas Heat Option furnace model number Digit 11=9 or C) "

<table>
<thead>
<tr>
<th>Display Code</th>
<th>Description</th>
<th>Additional Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heartbeat</td>
<td>Normal operation</td>
<td></td>
</tr>
<tr>
<td>1 Flash</td>
<td>Pressure switch open, Inducer on</td>
<td>Check inducer, pressure switch and tubing.</td>
</tr>
<tr>
<td>2 Flashes</td>
<td>Pressure switch open, Inducer off after 5 min. run.</td>
<td>Check inducer, pressure switch and tubing.</td>
</tr>
<tr>
<td>3 Flashes</td>
<td>Limit switch open</td>
<td>Unit overheat or switch/wiring issue.</td>
</tr>
<tr>
<td>4 Flashes</td>
<td>Lockout: Five ignition trials in a call for heat</td>
<td>Will reset on next call for heat or in 1 hr.</td>
</tr>
<tr>
<td>5 Flashes</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>6 Flashes</td>
<td>Lockout: Five limit switch trips in a call for heat</td>
<td>Will reset in 1 hr. or with power cycle.</td>
</tr>
<tr>
<td>7 Flashes</td>
<td>Lockout: five many flame losses in a call for heat</td>
<td>Will reset on next call for heat or in 1 hr.</td>
</tr>
</tbody>
</table>

To clear furnace control board error codes, refer to the section "Clearing Furnace Control Board Error Codes" on page 7.

Table 9.2 - Staged Furnace Control Boards (United Technologies Single Stage Control) Error Codes
(Applies only to D-Cabinet Units with Gas Heat Option furnace model number Digit 11=A or D) "

<table>
<thead>
<tr>
<th>Display Code</th>
<th>Description</th>
<th>Additional Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steady On Green</td>
<td>Normal Operation</td>
<td></td>
</tr>
<tr>
<td>Steady On Amber</td>
<td>Flame is sensed, Normal operation</td>
<td></td>
</tr>
<tr>
<td>1 Flash</td>
<td>Pressure switch open, Inducer on</td>
<td>Check inducer, pressure switch and tubing.</td>
</tr>
<tr>
<td>2 Flashes</td>
<td>Pressure switch open, Inducer off after 5 min. run.</td>
<td>Check inducer, pressure switch and tubing.</td>
</tr>
<tr>
<td>3 Flashes</td>
<td>Limit switch open</td>
<td>Unit overheat or switch/wiring issue.</td>
</tr>
<tr>
<td>4 Flashes</td>
<td>Lockout: Five ignition trials in a call for heat</td>
<td>Will reset on next call for heat or in 1 hr.</td>
</tr>
<tr>
<td>5 Flashes</td>
<td>Not used</td>
<td></td>
</tr>
<tr>
<td>6 Flashes</td>
<td>Lockout: Five limit switch trips in a call for heat</td>
<td>Will reset in 1 hr. or with power cycle.</td>
</tr>
<tr>
<td>7 Flashes</td>
<td>Lockout: five many flame losses in a call for heat</td>
<td>Will reset on next call for heat or in 1 hr.</td>
</tr>
</tbody>
</table>

To clear furnace control board error codes, refer to the section "Clearing Furnace Control Board Error Codes" on page 7.
GAS HEAT OPTION COMPONENT LOCATION

Figure 10.1 - Gas Heat Option Gas Controls - B-Cabinet Sized Units

1. Power exhauster
2. Maxitrol EXA STAR modulating gas valve
3. Main combination gas valve
4. High limit control (hidden behind Item #2 on 80% efficiency furnace)
5. Solid state ignition control board
6. Furnace control board
7. Vent differential pressure proving switch
8. Direct spark ignitor
9. Manifold pressure tap on manifold tee
10. Flame sensor
11. Manifold piping with gas orifices
12. Condensate drain float switch (94% efficiency furnace only)
13. Compartment strip heater/thermostat (94% efficiency furnace only)
14. Not applicable
15. Heat exchanger tube drain tray with drain line (80% efficiency furnace only - not pictured)
16. Convenience outlet (optional feature)
GAS HEAT OPTION COMPONENT LOCATION

Figure 11.1 - Gas Heat Option Gas Controls - C-Cabinet Sized Units

1. Power exhauster
2. Maxitrol EXA STAR modulating gas valve (right-hand furnace only)
3. Main combination gas valve
4. High limit control
5. VB1285 primary furnace control board (for right-side furnace, but located on left side of cabinet)
6. Valve state relay to Carel controller (90% furnaces only)
7. Secondary furnace control board (for left-side furnace)
8. Direct spark ignition control board (cover removed)
9. Vent differential pressure proving switch
10. Direct spark ignitor (behind control boards on 90% furnaces)
11. Manifold tee pressure tap (primary furnace only)
12. Flame sensor (behind #5 on left hand 81% furnaces)
13. Manifold piping with gas orifices
14. Condensate drain float switches
15. Heat exchanger tube drain tray with drain line (81% furnaces only)
16. Compartment strip heater/thermostat (90% furnaces only)
GAS HEAT OPTION COMPONENT LOCATION

Figure 12.1 - Gas Heat Option Gas Controls - D-Cabinet Sized Units - 800,000 Btu/hr and Smaller (81% Eff)

1. Power exhauster
2. Maxitrol EXA STAR modulating gas valve (primary furnace only)
3. Main combination gas valve
4. High limit control (hidden behind piping as shown)
5. Solid state ignition control board (cover removed)
6. Furnace control board (cover removed)
7. Vent differential pressure proving switch
8. Direct spark ignitor
9. Manifold pressure tap on manifold tee (primary furnace only)
10. Flame sensor
11. Manifold piping with gas orifices
12. Heat exchanger tube drain tray with drain line
GAS HEAT OPTION COMPONENT LOCATION

Figure 13.1 - Gas Heat Option Gas Controls - D-Cabinet Sized Units - 900,000 Btu/hr and Larger (81% Eff)

1. Refer to Figure 7.1 for location of furnace positions.
2. Refer to Figure 12.1 for identification of furnace components.

- Secondary Furnace “B”
- Primary Furnace
- Secondary Furnace “A”
- Secondary Furnace “C”
GAS HEAT OPTION COMPONENT LOCATION

Figure 14.1 - Gas Heat Option Gas Controls - D-Cabinet Units - 620,000 Btu/hr and Smaller (94% Eff)

1. Power exhauster
2. Maxitrol EXA STAR modulating gas valve (primary furnace only)
3. Main combination gas valve
4. High limit control (hidden behind piping as shown)
5. Solid state ignition control board
6. Furnace control board (cover removed)
7. Vent differential pressure proving switch
8. Direct spark ignitor
9. Manifold pressure tap on manifold tee (primary furnace only)
10. Flame sensor
11. Manifold piping with gas orifices
12. Heat exchanger tube drain tray with drain line
13. Cabinet strip heater
Figure 15.1 - Gas Heat Option Gas Controls - D-Cabinet Units - 850,000 Btu/hr and Larger (Hybrid 87% Eff)

Refer to Figure 7.1 for location of furnace positions.

For identification of furnace components, refer to Figure 12.1 for the 81% efficient modules on the bottom and Figure 14.1 for the condensing modules on the top.