

INSTALLATION INSTRUCTIONS
GAS CONVERSION KIT
 For 50,000 to 400,000 BTU/HR
 HIGH EFFICIENCY GAS-FIRED PROPELLER UNIT HEATERS



▲ WARNING This conversion kit shall be installed by a qualified service agency in accordance with the manufacturer's instructions and all applicable codes and requirements of the authority having jurisdiction. If the information in these instructions is not followed exactly, a fire, explosion or production of carbon monoxide may result causing property damage, personal injury or loss of life. The qualified service agency performing this work assumes responsibility for the proper conversion of this appliance with this kit.

AVERTISSEMENT Cette trousse de conversion ne doit être installée que par le représentant d'un organisme qualifié et conformément aux instructions du fabricant et à tous les codes et exigences pertinentes de l'autorité compétente. Quiconque ne respecte pas à la lettre les instructions du présent guide risque de provoquer un incendie, une explosion ou des fuites de monoxyde de carbone entraînant des dommages matériels, des lésions corporelles ou la perte de vies humaines. L'organisme qualifié qui effectue les travaux est responsable de la conversion correcte de cet appareil à l'aide de cette trousse.

Kit Contents:

11CVKTNTN-HU050,

Natural Gas to Propane (LP), 50 MBH:

- Orifice Assembly, Propane (LP)
11505-10091-05P
- "Notice of Conversion" Label
11J17-02754
- Installation Instructions
11J30-09774

11CVKTNTN-HU1-2,

Natural Gas to Propane (LP), 100-200 MBH:

- Orifice Assembly, Propane (LP)
11505-10091-00P
- "Notice of Conversion" Label
11J17-02754
- Installation Instructions
11J30-09774

11CVKTNTN-HU300,

Natural Gas to Propane (LP), 300 MBH:

- Orifice Assembly, Propane (LP)
11505-10091-30P
- "Notice of Conversion" Label
11J17-02754
- Installation Instructions
11J30-09774

11CVKTNTN-HU400,

Natural Gas to Propane (LP), 400 MBH:

- Orifice Assembly, Propane (LP)
11505-10091-40P
- "Notice of Conversion" Label
11J17-02754
- Installation Instructions
11J30-09774

11CVKTPTN-HU050,

Propane (LP) to Natural Gas, 50 MBH:

- Orifice Assembly, Natural Gas
11505-10091-05N
- "Notice of Conversion" Label
11J17-06342
- Installation Instructions
11J30-09774

11CVKTPTN-HU1-2,

Propane (LP) to Natural Gas, 100-200 MBH:

- Orifice Assembly, Natural Gas
11505-10091-00N
- "Notice of Conversion" Label
11J17-06342
- Installation Instructions
11J30-09774

11CVKTPTN-HU300,

Propane (LP) to Natural Gas, 300 MBH:

- Orifice Assembly, Natural Gas
11505-10091-30N
- "Notice of Conversion" Label
11J17-06342
- Installation Instructions
11J30-09774

11CVKTPTN-HU400,

Propane (LP) to Natural Gas, 400 MBH:

- Orifice Assembly, Natural Gas
11505-10091-40N
- "Notice of Conversion" Label
11J17-06342
- Installation Instructions
11J30-09774

HIGH ALTITUDE DERATION: The main control board on the unit will automatically adjust for altitude without the need to adjust gas pressure, pressure switches or orifice sizes. See the main unit installation, operation and maintenance manual for further information on derated output percentages.

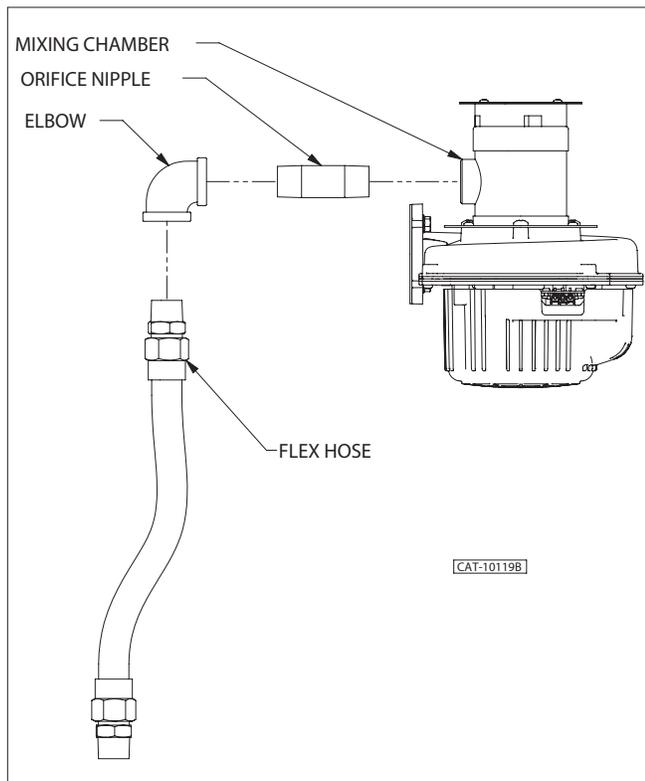
READ ALL INSTRUCTIONS COMPLETELY BEFORE BEGINNING ANY WORK!

1. All work must be performed by a fully qualified, experienced, and trained service technician. It is the responsibility of the installer to follow all instructions. Failure to follow these instructions could result in serious injury or property damage.
2. The qualified agency performing the work assumes responsibility for the conversion.
3. **▲ CAUTION** The gas supply should be shut off prior to disconnecting the electrical power. Both the gas and electrical supply must be off prior to starting the conversion.
4. Wear safety glasses.
5. Be sure of ladder placement. Do not allow people to stand below or around the area where the work is being performed. Do not lean ladders or equipment against the heater at any time during the conversion.

REPLACING THE ORIFICES (See Figure 1)

6. Remove the four screws holding the access panel and remove the panel.
7. Using the proper size wrench, loosen the upper flex line union that is attached to the mixing chamber assembly (see Figure 1); size 50-200 = 1/2 inch, size 300-400 = 3/4 inch.

Figure 1 – Gas Train Assembly



8. Using a Phillips screw driver, remove the 6 screws that attach the mixing chamber to the combustion blower.
9. Place mixing chamber on flat surface and unthread the 90 degree elbow from orifice nipple. Then unthread the orifice nipple from the mixing chamber. Keep the original orifice separate from the new orifice at all times.

NOTE: Orifice should be sizes shown in the Table 1. All Propane (LP) gas orifices are painted red.

Table 1 – Main Burner Orifice Schedule

Unit Size	50	100	150	200	300	400
Natural Gas	0.144 in.	0.282 in.	0.282 in.	0.282 in.	0.266 in.	0.323 in.
Propane (LP) Gas	0.096 in.	0.213 in.	0.213 in.	0.213 in.	0.228 in.	6.6 mm.

* This schedule is for units operating at altitudes of 2,000 feet (610 m) or less. See GAS INPUT RATE section of the unit installation, operation, and maintenance manual for field deration information.

10. Ensure that the number stamped on the orifice matches the size listed in Table 1. Apply pipe sealant to the threads of the new orifice nipple and thread into mixing chamber. Note, orifice side of nipple should be closest to mixing chamber.
 11. Thread the 90 degree elbow and flare union onto the orifice nipple.
 12. Re-install the mixing chamber on the combustion blower ensuring the O-ring gasket is secure in the combustion blower groove. Align and tighten the flex line union to the mixing chamber assembly.
- OPERATION**
13. To adjust gas valve:
 - a. For size 50 thru 200 units, using a 2.5mm wrench turn the set screw on the gas valve high fire flapper clockwise when converting to LP and counter clockwise when converting to natural gas (see Figure 2A) until resistance is felt.
 - b. For size 300 and 400 units, see START-UP section.
 14. Then turn the set screw open to the number of turns listed in Table 2.
 - a. For Propane (LP) Gas units:
 - For size 50/200 units, turn adjustment clockwise to the number of turns shown.
 - For size 300/400 units, see START-UP section.
 - b. For Natural Gas units:
 - For size 50/200 units, turn adjustment counterclockwise to the number of turns shown.
 - For size 300/400 units, see START-UP section.

Table 2 – Gas Conversion High Fire Flapper Adjustment

Unit Size (MBH)	Natural Gas to Propane (LP) Gas	Propane (LP) Gas to Natural Gas
50	1/2 CW	1/2 CCW
100	1-3/4 CW	1-3/4 CCW
150	1-1/2 CW	1-1/2 CCW
200	2-1/2 CW	2-1/2 CCW
300	See Start-Up Section	
400		

Note: "CW" indicates clockwise rotation and "CCW" indicates counterclockwise rotation.

15. Turn on gas and electrical supply.
16. Fire the unit using the Start-Up procedure below.
17. Set control mode DIP switches #1-5 to OFF. Disconnect 2-10 VDC wires, if applicable.
18. Adjust the RUN % potentiometer to 100% for high fire. Ensure the high fire CO₂ is within the range shown in Table 3.

Table 3 – CO₂ and O₂ Operation Range

Unit Size (MBH)	High Fire - CO ₂ Range		High Fire - O ₂ Range	
	Natural Gas	Propane (LP) Gas	Natural Gas	Propane (LP) Gas
50	7.4 - 7.9%	8.7 - 9.3%	7 - 7.9%	6.7 - 7.6%
100	7.5 - 8.0%	8.9 - 9.3%	6.9 - 7.7%	6.5 - 7.6%
150	7.4 - 7.9%	8.7 - 9.3%	7 - 7.9%	6.7 - 7.6%
200	7.5 - 8.0%	8.9 - 9.3%	6.9 - 7.7%	6.5 - 7.6%
300	7.5 - 8.0%	8.6 - 9.0%	6.9 - 7.7%	6.5 - 7.3%
400	7.5 - 8.0%	8.6 - 9.3%	6.9 - 7.7%	6.5 - 7.3%
Unit Size (MBH)	Low Fire - CO ₂ Range		Low Fire - O ₂ Range	
	Natural Gas	Propane (LP) Gas	Natural Gas	Propane (LP) Gas
50	4.2 - 5.0%	5.3 - 5.8%	12 - 13.3%	12 - 12.7%
100	4.2 - 5.0%	5.3 - 5.8%	12 - 13.3%	12 - 12.7%
150	4.2 - 5.0%	5.3 - 5.8%	12 - 13.3%	12 - 12.7%
200	4.2 - 5.0%	5.3 - 5.8%	12 - 13.3%	12 - 12.7%
300	4.0 - 4.5%	5.0 - 5.4%	12.3 - 13.6%	12.5 - 13.1%
400	4.2 - 5.0%	5.3 - 5.8%	12 - 13.3%	12 - 12.7%

19. Adjust the RUN % potentiometer to 33% for low fire. Ensure the low fire CO₂ is within the range shown in Table 3.
20. Set control mode DIP switches to the desired control mode and turn the thermostat to the desired position. Reconnect 2-10 VDC wires, if applicable.
21. Check all joints for leaks using a soap solution. Never use an open flame to check for gas leaks.
22. Apply conversion plate and label to inner side of the gas valve access panel. The conversion plate must be installed as closely as possible to the existing heater rating plate.

START-UP (Also refer to lighting instruction plate equipped on the unit)

1. Open the manual gas valve in the gas supply line to the unit heater. Loosen the union in the gas line to purge it of air. Tighten the union and check for leaks.

▲ WARNING Never use an open flame to detect gas leaks. Explosive conditions may exist which could result in personal injury or death.

2. Open the manual valve on the unit heater.
3. Set control mode DIP switches #1-5 to OFF. Disconnect 2-10 VDC wires, if applicable.
4. Turn ON the electrical power.

5. The unit should be under the control of the thermostat. Place a jumper between R and W1 and determine that the combustion blower and power venter motors start beginning pre-purge. After 30 seconds, the orange ignition LED should be flashing (on the control board located in the control box), burners will ignite and unit will run at this ignition period for one minute. The orange ignition LED will become solid.
6. Set (Run %) potentiometer to 100% on the control board to force the unit to high fire. Turn clockwise (100).
7. It may take a few minutes for the unit to modulate, but once in high fire, measure the supply gas pressure and record. Supply gas pressure should be 5.0 to 14.0" W.C. for natural gas, 8.0 to 14.0" W.C. for propane (LP) gas.
8. Place a combustion analyzer in the flue pipe. Carbon dioxide (CO₂) should be within the range shown in Table 3. Carbon monoxide (CO) values will vary depending on flue pipe length, but CO should always be below 100 PPM. If CO/CO₂ values are not within the given range:
 - a. For unit sizes 50/200, adjust high fire adjustment on gas valve until it is within range. Adjustments should be made with small increments, a quarter (1/4) turn at a time. Clockwise rotation decreases input, counter clockwise increases input.
 - b. For unit sizes 300/400, turn the trim valve stem until it is within range using an adjustable wrench. Adjustments should be made in small increments, an eighth (1/8) turn at a time. Clockwise rotation decreases input, counter clockwise rotation increases input.

NOTE: See figures 2A and 2B for gas valve and trim valve adjustment locations.

9. Turn the (Run %) potentiometer counter clockwise (33) to force the unit to low fire.
10. Measure CO/CO₂ using a combustion analyzer. CO₂ should be within the range shown in Table 3. CO values will vary depending on flue pipe length, but CO should always be below 100 PPM. If CO/CO₂ values are not within the given range:
 - a. For unit sizes 50/200, adjust low fire adjustment on gas valve until it is within range. Adjustments should be made with small increments, a quarter (1/4) turn at a time. Clockwise rotation increases input, counter clockwise decreases input.
 - b. For unit sizes 300/400, adjust gas valve adjustment on gas valve until it is within range. Adjustments should be made with small increments, a quarter (1/4) turn at a time. Counter clockwise rotation increases input, clockwise decreases input.

NOTE: See figures 2A and 2B for gas valve and trim valve adjustment locations.

11. Remove the call for heat between R and W1.
12. Turn the thermostat to the lowest point and determine that the combustion blower and power venter motors shut off and the burners are extinguished.
13. Set control mode DIP switches to the desired control mode and turn the thermostat to the desired position. Reconnect 2-10 VDC wires, if applicable.