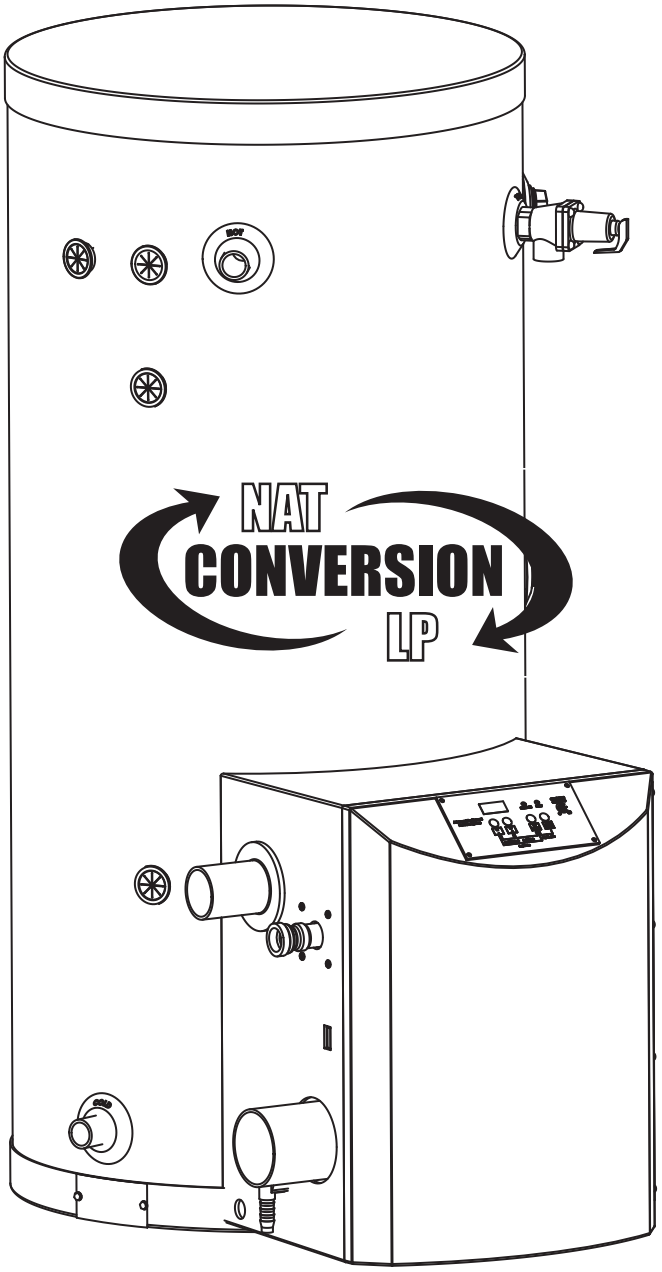
CONVERSION INSTRUCTIONS FOR GAS-FIRED (PROPANE OR NATURAL GAS) COMMERCIAL CONDENSING WATER HEATER



STOP! Follow these instructions or warranty will be void!

⚠ DANGER

This conversion shall be done by a qualified service agency in accordance with these instructions, 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 in substantial property damage, severe personal injury, or death.**

IMPORTANT

READ THESE INSTRUCTIONS CAREFULLY BEFORE BEGINNING THE INSTALLATION. PROPER INSTALLATION WILL PROVIDE SAFE & EFFICIENT SERVICE AND AVOID NEEDLESS EXPENSES NOT COVERED BY THE WARRANTY. READ THE PRODUCT WARRANTY IN THE OWNER'S MANUAL AND REMEMBER TO FILL OUT AND RETURN TO THE MANUFACTURER ALL RELEVANT WARRANTY CARDS AND CERTIFICATES. SHOULD YOU HAVE ANY QUESTIONS, PLEASE CONTACT YOUR LOCAL DEALER OR REFER TO THE ***GETTING SERVICE FOR YOUR WATER HEATER*** SECTION OF THE OWNER'S MANUAL.

SAVE THIS CONVERSION MANUAL FOR FUTURE REFERENCES.

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⚠ WARNING

Before putting the water heater into operation, verify that the type of gas supplied to your water heater and the type of gas your water heater is set to burn are the same. If not, refer to these instructions.

OVERVIEW

INSTALLATION MUST COMPLY WITH:

1. National Electrical Code.
2. The latest version of the National Fuel Gas Code, ANSI Z223.1.
3. In Canada, CSA C22.1 Canadian Electrical Code Part 1, and CGA No. B149 (latest version).
4. Local, state, provincial, and national codes, laws, regulations and ordinances.

ITEMS NEEDED FOR CONVERSION INCLUDED IN KIT

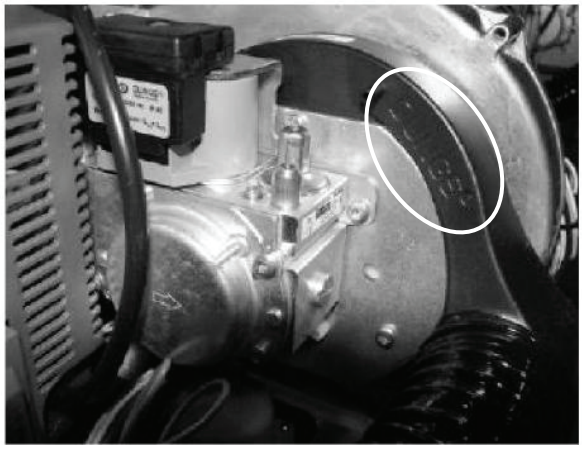
- One (1) Transparent Conversion Tag
- One (1) Appliance Conversion Date Label
- One (1) Plastic Gas ID Tag with (2) Self-Tapping #4x¾" (1.9 cm) screws to mount to the Outer Jacket Plastic Cabinet
- U.L. Approved High Temperature Metal Foil Tape (included)

TOOLS REQUIRED (NOT INCLUDED)

- Flat head screwdriver
- CO tester for combustion readings
- 2mm and 4mm Allen keys

These instructions are for the conversion of Direct Fired Heater Models with the Dungs Gas Valve. Please make sure that the model you are converting has the Dungs Gas Valve. (**See Figure 1** for verification)

Figure 1



STEP 1: PREPARATION

Turn off all electrical power to the heater. Shut off the gas with the manual shutoff before beginning the conversion. Make sure that you are properly connected to the gas supply. Check the gas piping and pressure to assure proper sizing for the heater firing rate. It is recommended that you contact your gas supplier to verify correct gas piping size and proper connection. It may also be necessary to install a 100% lockup gas pressure regulator of sufficient size to supply the correct pressure and gas flow.

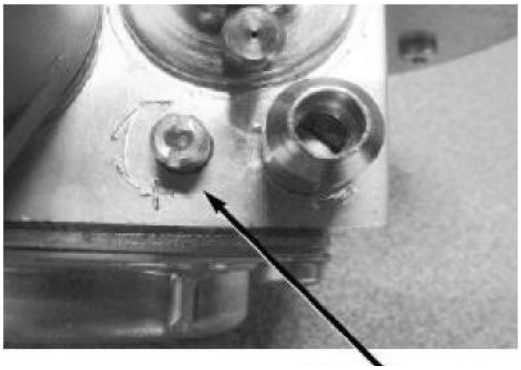
STEP 2: GAS VALVE ADJUSTMENT

NOTE: This procedure will have to be repeated with an additional combustion system.

You can now proceed to adjust the gas by turning the throttle screw located on the top of the Dungs Gas Valve (**see Figure 2**). To adjust the valve, you will need a small slotted screw driver or a 2mm Allen key. Turn the throttle **CLOCKWISE** until it bottoms out, then, using Table 1 as a guide, adjust the throttle **COUNTERCLOCKWISE** the correct amount of turns based on the BTU rating of the heater.
The following adjustment chart is based on the conversion fuel type.

NOTE: You must bottom out the throttle screw by turning it clockwise before beginning the adjustment.

Figure 2



Throttle screw

Table 1

BURNER OUTPUT	FUEL TYPE	COUNTERCLOCKWISE TURNS TO CONVERT
100,000 BTU	NAT CONVERSION LP From Natural to Propane	6 ½ Turns
100,000 BTU	NAT CONVERSION LP From Propane to Natural	12 Turns
130,000 BTU	NAT CONVERSION LP From Natural to Propane	6 ½ Turns
130,000 BTU	NAT CONVERSION LP From Propane to Natural	12 Turns
160,000 BTU	NAT CONVERSION LP From Natural to Propane	2 ¾ Turns
160,000 BTU	NAT CONVERSION LP From Propane to Natural	5 Turns
199,000 BTU	NAT CONVERSION LP From Natural to Propane	2 ¾ Turns
199,000 BTU	NAT CONVERSION LP From Propane to Natural	5 Turns

Table 2

COMBUSTION SETTINGS ON ALL MODELS						
	Natural Gas			Propane (LP)		
Fan Speed	Low	Ignition	High	Low	Ignition	High
Carbon Monoxide PPM	1 – 10	2 – 15	2 – 20	1 – 10	2 – 15	2 – 20
Carbon Dioxide (CO_2)	8 – 10%	8 – 10%	8 – 10%	8 ½ – 10 ½%	8 ½ – 10 ½%	9 – 11%

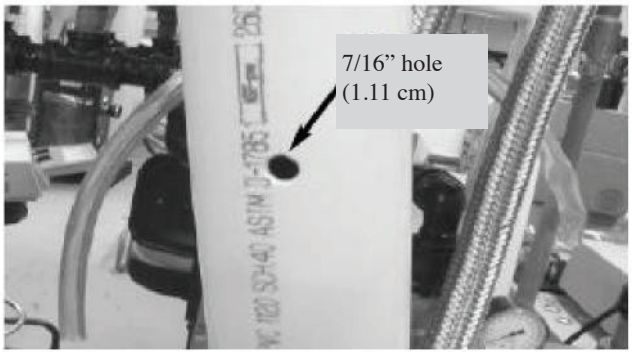
Table 3

FAN SPEEDS			
BTU	IGNITION	MINIMUM	MAXIMUM
100,000	3,000	2,000	5,400
130,000	3,000	2,000	6,950
160,000	3,000	2,000	8,500
199,000	3,000	2,000	8,500

STEP 3: VERIFYING THE COMBUSTION SETTING

Drill a 7/16" (1.11 cm) hole into exhaust piping one (1) foot (30.5 cm) from the heater to be used as a test port for the gas tester (CO Meter) (**see Figure 3**).

Figure 3



⚠ WARNING

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.
- Immediately call your gas supplier from a neighbor's phone.
- Follow 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.

⚠ WARNING

It is very important that this conversion is set within the recommended CO measurements. Visually looking at the burner does not determine flame quality. CO measurement with a combustion meter is the only way to assure a correct adjustment. **Failure to properly adjust the flame could result in serious injury or death.**

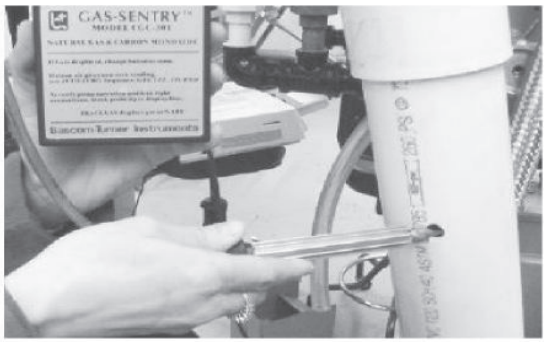
Turn the manual gas shut off back on.

The heater must be run in service mode to fine tune the throttle for the most efficient combustion.

Turn on power to the heater. Verify that the tank temperature is no higher than 100°F (37.7°C) so the burner will reach high fire. The number displayed on the panel when you power up the heater is the tank temperature. You may have to run some water through the tank to get the temperature below 100°F (37.7°C).

NOTE: The burner will light up at this time. This is normal.

Figure 4 – Inserting the Nozzle



Put the heater into Service Mode by pressing the S2 and S3 keys at the same time. Place the combustion analyzer probe into the exhaust pipe through the 7/16" (1.11 cm) hole (**see Figure 4**). It is recommended that you take the gas reading first at full fan speed by pressing S1 until the fan speed will go no higher (**see Table 3** for fan speeds). Wait for the meter and CO reading to stabilize.

After you obtain the maximum speed reading, go to the minimum fan speed by pressing S1 until the fan speed will go no lower. After the meter stabilizes, obtain the low fire reading. Compare these readings to Table 2. If the readings are higher than the maximum specified in Table 2, adjust the throttle screw in the clockwise direction (approx. ¼ turn) and recheck the readings. Repeat this procedure until the values obtained on the CO meter agree with Table 2.

If the readings obtained are lower than the combustion readings in the chart, adjust the throttle screw in the counter-clockwise direction (approx. ¼ turn) and recheck the readings. Repeat this procedure until the values obtained on the CO meter agree with Table 2.

When the readings are within the specified range, record the readings on the enclosed registration form.

NOTE: The heater will stay in Service Mode for a maximum of ten minutes. It may be necessary to restart Service Mode if you have not completed combustion adjustments within the ten minute period.

Figure 5 – Covering the Hole in the Exhaust

STEP 4: COVER HOLE IN PIPE

After the combustion test is complete, leave the Service Mode and return to normal operation by pressing S1 and S2 at the same time. The outlet temperature will be displayed. Wrap the supplied high temperature foil tape completely around the PVC pipe (as shown in **Figure 5**). Make sure that the area is clean before applying the tape to the PVC pipe. It is recommended that you wrap the entire diameter of the pipe to assure proper adhesion to the pipe surface.

STEP 5: PLACE LABELS

Place labels provided with the conversion instructions in the proper locations.

- Place the label with information filled in by the Qualified Service Technician in an area close to the gas valve shut off as shown in **Figure 6**.
- Place the CLEAR WARNING LABEL THAT STATES THE TYPE OF GAS CONVERSION (provided in your conversion kit) over the existing rating label on the heater (as shown in **Figure 7**). Make sure to keep the model and serial numbers exposed.
- Replace the “THIS UNIT OPERATES ON” plastic tag with the new gas type (provided in the conversion kit) in the same location as the one on the heater using the provided screws (**see Figure 8**). **NOTE:** On older models, you may not have this type of tag. In this case, remove all labels referencing gas type (with the exception of the ratings label) and place the new tag provided in as conspicuous location as close to the gas valve as possible. **NOTE:** You may need to drill two (2) 1/16” (25 mm) holes in order to mount the tag.
- It is VERY important that the conversion verification envelope with the Model and Serial numbers be completed and sent back to the factory to register the heater conversion and continue warranty coverage. **NOTE: FAILURE TO DO SO MAY VOID WARRANTY!** It is recommended you keep a copy of this for your records.

Figure 6 – Label Filled In by Service Technician

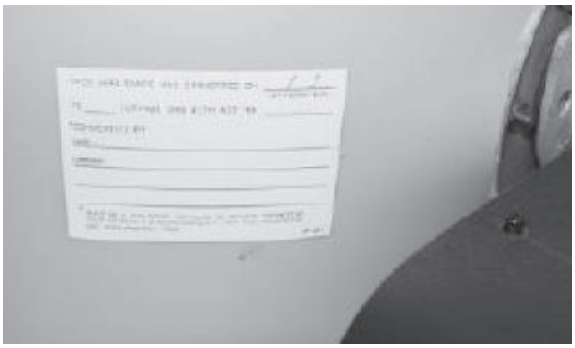
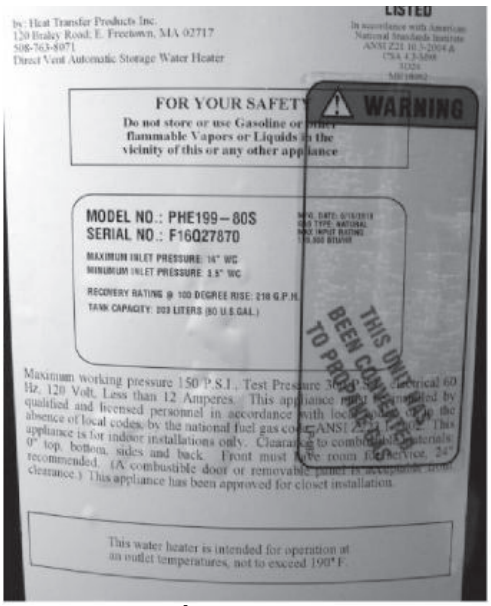


Figure 7 - Clear Label



Leak Testing the Gas Connections

You **MUST** leak test the gas connections before placing the water heater in operation.

- Light the water heater as outlined in the Owner's Manual.

- Using a soap and water solution or leak test solution, test all of the gas connections to the gas control by spraying the solution on them. The presence of bubbles means that there is a leak. If this occurs, tighten the connection and re-test. Please, make sure not to wet the wires of the ignitor.

Figure 8 – Plastic Tag

MARKING

The conversion label provided in this kit **MUST BE** filled out and placed on the water heater next to the rating plate when the conversion is made **(see Figure 9)**.

The rating plate provided in this conversion kit **MUST BE** filled out with the date code and serial number from the original rating plate on the water heater. Then, this new rating plate **MUST BE** placed over the original one on the water heater.

Figure 9

CONVERSION LABEL

Refer to the "**GAS CONVERSION INSTRUCTIONS**" on the water heater for important information on the conversion of this water heater.

This water heater was converted

on _____ to _____ Gas
(day/month/year)

by:_____

_____
(name and address of organization making this conversion, who accepts the responsibility for the correctness of this conversion).

Affix this conversion label as close as possible to the existing rating plate.

CONVERSION CHECKLIST

- Did you turn off all electrical power and manually shut off gas to the heater? ..... ☐
- Are you properly connected to the gas supply? ..... ☐
- Is the gas piping and pressure with the proper sizing for the heater firing rate? ..... ☐
- Did you contact the gas supplier to verify correct gas piping size and proper connection? ..... ☐
- Did you adjust the gas by turning the throttle screw? ..... ☐
- Did you verify the combustion setting? ..... ☐
- Did you cover the hole in pipe? ..... ☐
- Did you place labels? ..... ☐
- Did you leak test the gas connections? ..... ☐