

PUREFIRE[®] Gas Conversion Instructions for Propane or Natural Gas

⚠ WARNING

This conversion kit shall be installed by a qualified installer, service agency, or the gas supplier 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, an explosion, or production of carbon monoxide can result causing property damage, personal injury, or loss of life. The qualified installer, service agency, or the gas supplier is responsible for the proper installation of this kit. The installation is not proper and complete until the operation of the converted appliance is checked as specified in the manufacturer's instructions supplied with the kit.

⚠ WARNING

If the information in these instructions is not followed exactly, a fire, an explosion or production of carbon monoxide may result causing property damage, personal injury or loss of life.

Stop! Read these instructions or warranty will be void!

ITEMS REQUIRED FOR CONVERSION

- "Valve Converted to LP" Label (9349, included)
- "Valve Converted to Natural Gas" Label (9350, included)
- Boiler Conversion Label (9486, included)
- Flat Blade Screwdriver
- Combustion Analyzer with Carbon Dioxide and Carbon Monoxide Reading Capability (Testo 325-M or equivalent)
- 21/64" Drill
- 1/8" NPT Tap and plug (PVC and CPVC venting only)

The boiler conversion must be done by a qualified installer or service technician in accordance with these instructions and must meet all local codes and requirements of the authority having jurisdiction. The qualified installer or technician performing this work assumes full responsibility for this conversion.

It is important that you follow the conversion procedure in the proper sequence. We have enclosed for your convenience three conversion labels, one of which will be attached to the inside of the boiler and one which will be placed near the rating label on the outside of the boiler. One will not be used.

⚠ WARNING

It is very important that you carefully follow the instructions below correctly. Death or serious injury could result.

Note: Failure to do so will void your warranty.

STEP 1

Turn off all power to the unit. Shut the gas off with the manual shutoff valve. Make sure that the gas supply is connected. Check gas pressure and gas piping to assure proper sizing to the boiler firing rate.

If connected to LP gas, it is recommended that you contact your gas supplier to size the piping and the tank. It may also be necessary to install a 100% lockup gas pressure regulator of sufficient capacity to supply an adequate gas flow.

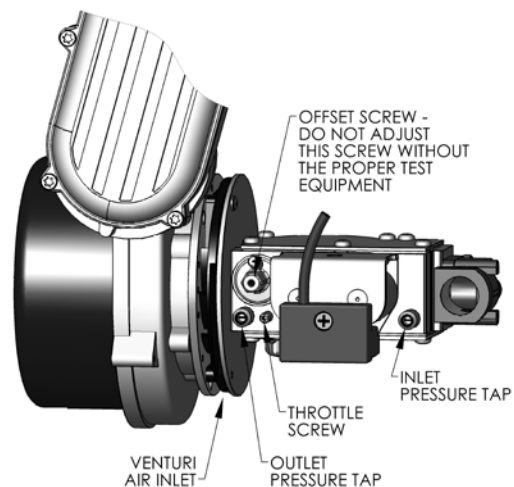


Figure 1

STEP 2 - PVC & CPVC ONLY

Drill and tap a 21/64" diameter, 1/8" NPT hole into exhaust piping 1 foot from unit to be used as a test port for the combustion analyzer. See Figure 2.

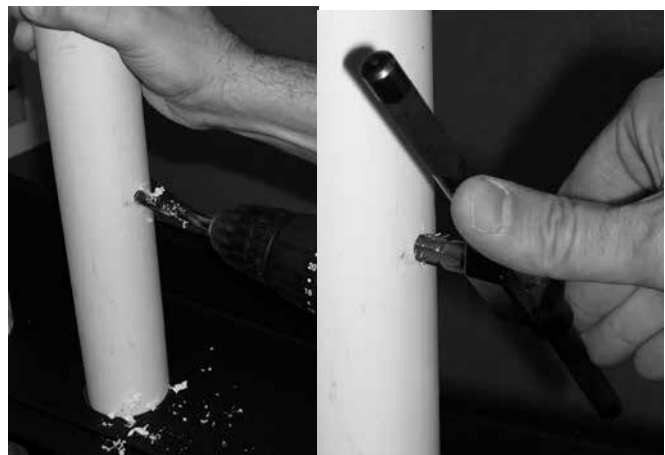


Figure 2

STEP 3

Turn on the manual gas shutoff valve. Check for gas leaks. If leaks are found, turn off the gas and repair the leaks.

⚠ WARNING

If you smell gas:

- Turn off the gas supply.
- 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 up within the recommended combustion measurements in Step 4. Visually looking at the flame does not determine flame quality. A combustion measurement using a combustion analyzer with CO and CO₂ reading capability is the only way to assure a correct adjustment.

STEP 4

NOTE: When converting a Natural Gas Boiler to an LP Gas Boiler, turn the gas valve throttle screw clockwise 1 to 2 turns.

When converting an LP Gas Boiler to a Natural Gas Boiler, turn the gas throttle screw counterclockwise 1 to 2 turns.

Do not adjust the offset screw without appropriate test equipment. Failure to do so could result in significant increase or decrease in CO₂ levels. Please refer to Table 1 for CO₂ level reference.

These adjustments are not final. Follow the procedure below for final adjustments.

Turn on the power to the boiler. Place the Control Board into System Test Mode by holding down the "Menu" and "Select" keys simultaneously for 10 seconds. Then press the "→" key until the "▼" indicates System Test. Press the "Select" key to choose the menu.

Select Maximum Power on the System Test menu. Insert the combustion analyzer probe into the test port. See Figure 3. The combustion readings should agree with Table 1.

If the combustion readings do not agree with Table 1, turn the throttle screw as shown in Figure 4 and Table 2 until readings are within the acceptable range as shown in Table 1. Record the High Fire combustion readings on the combustion data sheet, Table 3.

Select Low Power on the System Test menu. Record the Low Fire combustion readings after they have stabilized.

If you need to adjust the CO₂ level, use a 2mm hex key. Turn the key approximately 1/8 of a turn **clockwise to increase** the CO₂ level. After adjusting, wait a few minutes for the combustion analyzer to update its reading. If you need to **decrease** the CO₂ level, turn the key **counterclockwise**. Repeat this process carefully until you achieve the desired CO₂ level.

Table 1

	Natural Gas		Propane (LP)	
	Low Fire	High Fire	Low Fire	High Fire
Carbon Monoxide (CO)	< 75 ppm	< 150 ppm	< 75 ppm	< 150 ppm
Carbon Dioxide (CO ₂)	8.8% to 11.5%	8.5% to 9.7%	9.8% to 12.5%	9.5% to 10.5%
Excess Oxygen (O ₂)	0.7% to 5.4%	3.9% to 6.0%	1.9% to 6.0%	4.9% to 6.5%
Excess Air	3.2% to 31.2%	20.1% to 35.4%	8.9% to 35.9%	27.6% to 39.8%

1. Combustion measurements should be taken during steady state operation. Values during significant transitions may exceed the numbers shown.
2. Conversions to excess oxygen and excess air are based on natural gas consisting of 100% methane (CH₄) or 100% propane (C₃H₈).



Figure 3



Figure 4

Table 2

Turning Gas Valve Throttle Screw		
	If CO is not too high	If CO is too high
If CO ₂ is too high	Turn Clockwise (-)	Turn Clockwise (-)
If CO ₂ is too low	Turn Counterclockwise (+)	Turn Clockwise (-)*

* Very high CO with low CO₂ indicates possible unburned gas due to insufficient air.

STEP 5

After the combustion test is complete, exit the System Test mode and return to normal operation. Plug the test port. For PVC and CPVC venting, use a standard 1/8" NPT pipe plug. See Figure 5.



Figure 5

STEP 6

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

- Place the appropriate valve conversion label as close to the adjusted gas valve as possible, inside the boiler enclosure. See Figure 6.



Figure 6

- Fill in required information on the appropriate boiler conversion label. Place label next to rating label. See Figure 7.



Figure 7

⚠ WARNING

It is extremely important that all enclosed conversion labels are placed in the proper locations shown. Not following these instructions correctly could result in death or serious injury.

Table 3

Combustion Test Record			
Installation Information			
Contact:		Phone Number:	
Company Name:		Fax Number:	
Address:		Email Address:	
Job Name:		Jobsite Address:	
Boiler Model:		Boiler Serial No.:	
Manufacture Date:		Conversion Date:	
Pressure Readings			
Intake Gas Pressure (in. w.c.):		Intake Gas Pressure Drop at Startup:	
High Fire Outlet Gas Pressure (in. w.c.):		Low Fire Outlet Gas Pressure (in. w.c.):	
Combustion Readings			
Flame Signal High Fire (μA):		Flame Signal Low Fire (μA):	
CO ₂ High Fire (%):		CO ₂ Low Fire (%):	
CO High Fire (ppm):		CO Low Fire (ppm):	
Fan Speed High Fire (°F):		Fan Speed Low Fire (°F):	
Excess Air High Fire (%):		Excess Air Low Fire (%):	
Exhaust Temp High Fire (°F):		Exhaust Temp Low Fire (°F):	



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