LP and High Altitude LP Gas Conversion Kit
For United States Installations (0 - 10,000 ft.)

Installation Instructions

R6GP Light Commercial Packaged Gas Electric Units

IMPORTANT: Read all instructions before beginning the conversion of the appliance.

This conversion kit is only for United States installations to convert a natural gas furnace to either a propane (LP) gas application or a high altitude LP application. For Canadian installations, the Canadian conversion kit must be used.

This conversion kit is backwards compatible with R4GM & R4GN units. Contact NORDYNE Technical Services for more information on these appliances.

⚠ WARNING:

This conversion kit is to be installed by a qualified service technician in accordance with these instructions and all codes having jurisdiction. Failure to follow these instructions could result in serious injury, property damage, or death. The qualified service technician performing this work assumes responsibility for this conversion.

⚠ CAUTION:

All gas piping must conform with local building codes or, in the absence of local codes, with most recent edition of the National Fuel Gas Code ANSI Z223.1. All electrical wiring must comply with the latest edition of the National Electrical Code ANSI/NFPA 70.

These instructions are primarily intended to assist qualified individuals experienced in the proper installation of this appliance. Some local codes require licensed installation/ service personnel for this type of equipment.

⚠ WARNING:

DO NOT REMOVE OR DEFACE THE ORIGINAL RATING PLATE.

⚠ CAUTION:

The gas supply shall be shut off prior to disconnecting the electrical power, before proceeding with the conversion.

To Turn Off the Fuel Supply to the Appliance:

1. Set the room thermostat to "OFF" or its lowest temperature setting.
2. Turn OFF the main gas supply to the appliance at the manual valve, outside of the appliance casing.
3. Turn OFF all electrical power to the appliance.
4. Remove the burner access panel louvered door.
5. Move the appliance gas valve lever/knob to the "OFF" position. See Figures 1 and 3.

To Remove the Burner Manifold Assembly:

1. Follow the instructions "To Turn Off the Fuel Supply to the Appliance".
2. Disconnect the flame sensor wire at the burner box.
3. Disconnect the spark ignitor wire at the burner box.
4. Remove the white wires from the Stage-1 terminal of the gas valve. Remove the brown wire from the Stage-2 terminal of the gas valve. Remove black common wire from gas valve.
5. Remove (if installed) supply gas piping from the gas valve.
6. Remove the four (4) fasteners that secure the gas manifold to the burner box, as shown in Figure 1. Carefully remove the gas manifold assembly from the burner box. Note that the gas manifold assembly consists of the gas valve, the gas manifold, and the orifices.
7. Identify the gas valve manufacturer listed on the gas valve label. Convert the valve for operation with LP gas as described in the appropriate manufacturers instructions. (Included)

⚠ CAUTION:

Caution: Do not re-drill the burner orifices. If the orifice size must be changed, use only new orifices.

Note: The size of the new orifices that will be installed into the unit will depend upon the type of conversion (sea level or high altitude). Please refer to Table 1 for more details on your particular conversion.

Kit Includes:

Description	Part No.	Qty.
Burner Orifice # 51	636051	7
Burner Orifice # 52	636052	7
Burner Orifice # 53	636053	7
Burner Orifice # 54	661054	5
Burner Orifice # 55	661055	5
Conversion Warning Label	703935	1
Conversion Information Label	710005	1
These Installation Instructions	709010	1
Honeywell Gas Valve Conv. Kit	624667	1
White Rodgers Gas Valve Conv. Kit	618094	1

To Convert the Unit to LP Gas for Altitudes Between 0 and 10,000 Feet

1. Table 1 is a detailed listing of orifices required for converting R6GP Series units to LP Gas for altitudes between 0 and 10,000 feet. Please check the contents of the conversion kit with that of the parts listing, and familiarize yourself with each component.
2. Examine the rating plate of the unit to determine Model number and rated input (Btu/hr). Count the number of burners in the burner box. Cross check all information with Table 1 to determine the appropriate LP gas orifice size for your application.
3. Install the appropriate LP gas burner orifices into the gas manifold. Before installing an orifice, check the face or side of the orifice for the drill number to ensure that it is the appropriate size. When installing the new orifices, **DO NOT** use pipe joint compound on the orifice threads. Screw the orifices into the manifold by hand until snug to eliminate cross threading, then tighten with a wrench, 1/2 to 1 turn.
4. For units converted for operation above 2000 ft., follow the High altitude deration instructions.

High Altitude Deration

High altitude application with this unit depends on the installation altitude and the heating value of the gas. At high altitudes, the heating value of natural gas is always lower than the heating value at sea level.

All installations of this equipment must be made in accordance with the National Fuel Gas Code or with local jurisdiction codes. For installations at exactly 2,000 feet in altitude or under, the installer does not need to derate the heat exchanger performance. For any installation that exceeds 2,000 feet, please see the following instructions and example:

⚠ WARNING:

The reduction of input rating necessary for high altitude installation may only be accomplished with factory supplied orifices. Do not attempt to drill out orifices in the field. Improperly drilled orifices may cause fire, explosion, carbon monoxide poisoning, personal injury or death.

- If installing this unit above 2,000 feet, the input rate must be reduced 4% per 1,000 feet of altitude (Example: 12% at 3,000 feet, 16% at 4,000 feet, etc). Always round up to the next highest value of 1,000. So an installation at 3,120 feet is derated by 16% due to rounding up to 4,000. **NOTE:** This deration is necessary to compensate for low atmospheric pressure at high altitudes. Generally this will require obtaining the gas heating value from the local gas utility and replacing the burner orifices.

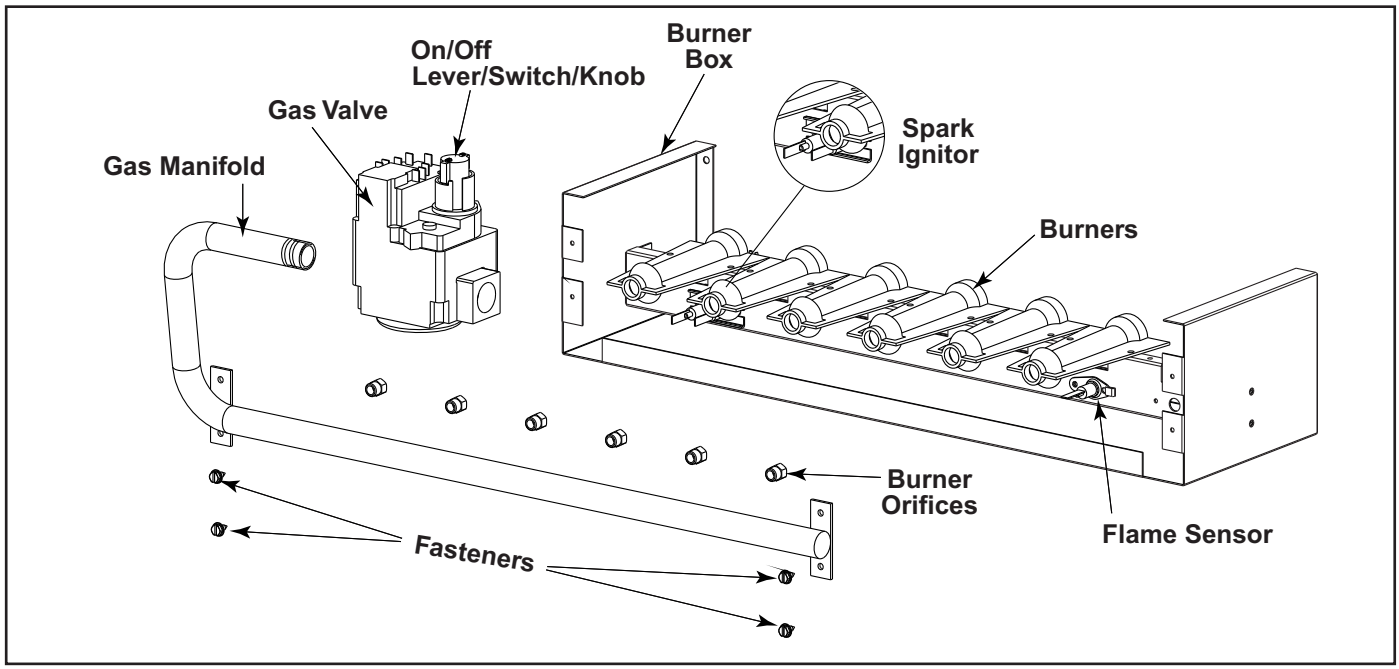

Figure 1. Typical Installation For R4GM Burner Box

Unit Model Number	Type Gas Fuel	Heating Input (Btuh)*	Gas Valve Manf.	Number of Burners	Orifice Size for Increased Elevation (Above Sea Level)				
					0 - 2,000 Ft	2,001 - 4,000 Ft	4,001 -6,000 Ft	6,001 - 8,000 Ft	8,001 - 10,000 Ft
R6GP-072*-100C	L.P.	85,000	Honeywell	3	53	54	54	55	55
R6GP-072*-166C	L.P.	141,000	Honeywell	5	53	54	54	55	55
R6GP-090*-200C	L.P.	175,000	Honeywell	6	53	54	54	55	55
R6GP-090*-200C	L.P.	175,000	White Rodgers	6	51	52	52	52	53
R6GP-120*-235C	L.P.	205,000	White Rodgers	7	51	52	52	52	53

* Refer to Instructions for High Altitude Deration to determine heat-exchanger capacity at increased elevations.

Table 1. Orifice or Drill Size for Propane (LP) Gases

- Table 1 lists the correct orifice size to use at different altitudes. See Installation Example 1 to determine the unit rating and orifice size.
- After changing the orifices, it is required that you measure the gas input rate by clocking the gas meter and using the local gas heating value. See section on Verifying and Adjusting the Firing Rate. **IMPORTANT NOTE: Observe the action of the burners to make sure there is no yellowing, lifting or flashback of the flame.**

INSTALLATION EXAMPLE:

Elevation: ..... 3,890 feet
Type of Gas: .....Propane
Unit Model: R6GP-090C200C

At 4,000 feet, the unit needs to be derated by 4% for each 1,000 feet of elevation. This equates to 16% or less than the sea level rating of 175,000 Btu/h.

1. Determine unit input rating:
   [175k x (100-16)%] = 147,000 Btuh. The required heating rate for 3,890 feet is 147,000 Btu/h.

2. Determine orifice size:
   From Table 1, find the Unit Model Number. Follow across the row and stop at the 2,001-4,000 elevation column. For this example, the orifice size displayed is #52. Install one #52 orifice in every burner and check firing rate. The firing rate in this example must not exceed 147,000 Btu/h.

Verifying and Adjusting Firing Rate

The firing rate must be verified for each installation to prevent over-firing of the unit.

⚠CAUTION:

Do not re-drill the burner orifices. If the orifice size must be changed, use only new orifices.

IMPORTANT NOTE: The firing rate must not exceed the rate shown on the unit data label. At altitudes above 2,000 ft., it must not exceed that on the data label less 4% for each 1,000 ft.

Follow the steps below to determine the unit firing rate:

- For installations at 2,000 feet and less, the firing rate is the same as shown on the unit rating label.
- For installations above 2,000 feet, compute the correct firing rate as shown in the installation example on this page.

1. Obtain the gas heating value from the gas supplier (HHV).
2. Ensure that the LP supply tank is full or that the supply line is at the correct supply pressure. Verify that the supply pressure is within the allowable unit limits as shown on the unit rating plate.
3. Shut off all other gas fired appliances.
4. Start the unit in heating mode and allow it to run for at least three minutes.
5. Using an in-line flow meter, measure the gas flow rate through the LP supply line to the unit. Convert the reading into cubic feet per hour. (Refer to the meter manufacturer's instructions, or the gas supplier for more information.
6. Multiply the gas flow rate in cubic feet per hour by the heating value of the gas in Btu per cubic foot to obtain the firing rate in Btu per hour. See Example:

Example:

- For a flow rate of 90 cubic feet gas per hour.
- Local heating value of the gas (obtained from gas supplier) = 1,040 Btu per cubic foot.
- Input rate = 1,040 x 90 = 93,600 Btuh.

7. Adjustments to the firing rate can be made by adjusting the gas manifold pressure.

The manifold pressure must be set to the appropriate value for your installation. To adjust the manifold pressure,

remove the regulator cap and turn the adjusting screw clockwise to increase pressure or counterclockwise to reduce pressure. Replace the regulator cap after adjustments are complete.

Reinstalling the Burner Manifold Assembly:

1. Carefully reinstall the gas manifold assembly to the burner box with the four (4) fasteners removed earlier.
2. After installing the manifold assembly to the burner box, inspect the alignment of the burners with the heat exchanger tubes. The center of the burners should be aligned with the center of the tubes. See Figure 2.
3. Reconnect the main gas piping to the gas valve.
4. Reconnect wiring to the gas valve terminals. Two White wires to Stage-1 and one Brown wire to Stage-2 and the black common wire to the "C" terminal.
5. Reconnect the spark ignitor wire to the spark ignitor.
6. Reconnect the flame sensor wire to the flame sensor.

Pressure Gauge Installation

NOTE: For LP gas installations. Refer to the unit rating plate to determine the incoming gas maximum and minimum inlet pressures.

IMPORTANT NOTES:

- **If pressure testing the gas supply lines at pressures greater than 1/2 psig (14 inches WC), the unit must be disconnected from the gas supply piping system to prevent damage to the gas valve.**

Lighting and Adjustment of the Appliance

1. Turn ON the gas at the manual valve, outside of the unit.
2. Check all gas connections for leaks with a soap and water solution. If the solution bubbles, there is a gas leak which must be corrected. **DO NOT** use an open flame to check for gas leaks.
3. Turn ON the electrical power to the appliance.
4. Move the gas valve lever/switch/knob to the “ON” position. The lever/knob must be moved to the end of its range of motion to insure the valve is completely open. Use only your hand to push in or turn the gas control valve. Never use tools.
5. Set the room thermostat to a point above room temperature to begin the heating cycle of the unit.
6. Check that the unit ignites and operates properly. Refer to the installation instructions provided with your unit for the normal operating sequence.
7. After the flame ignites, visually inspect the burner assembly to ensure that the flame is drawn directly into the center of the heat exchanger tube, as shown in Figure 2. The end of the flame will be out of sight around the bend of the heat exchanger tube. In a properly adjusted burner assembly, the flame color should be blue with some light yellow streaks near the outer portions of the flame.

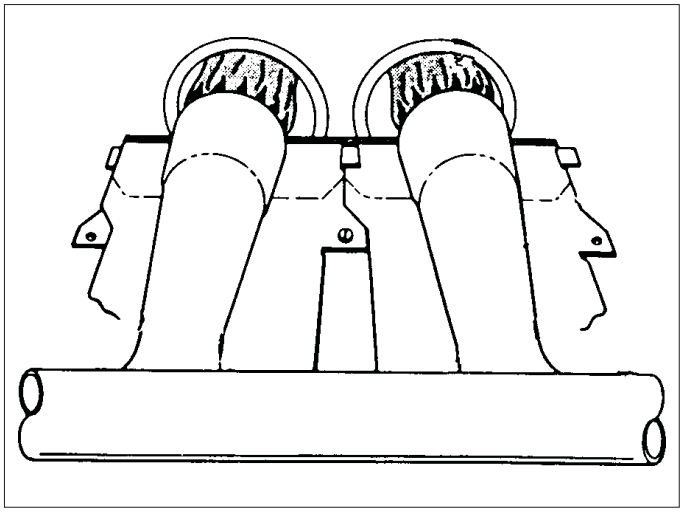

Figure 2. Burner Inspection

NOTE: Until all of the air is bled out of the gas line, the spark ignitor may not ignite the gas. If the ignition control locks out, turn the thermostat to its lowest setting and wait one minute then turn the thermostat to a point above room temperature. The ignitor will try again to ignite the main burners. This process may have to be repeated several times before the burners will ignite. Once the burners are lit, check all gas connections for leaks again with the soap and water solution. If the solution bubbles, there is a gas leak which must be corrected. Do not use an open flame to check for gas leaks.

Checking the Manifold Pressure

The manifold pressure can be measured by installing a pressure gauge or U-tube manometer to the outlet end of the gas valve as follows:

1. Turn off gas prior to installing manometer.
2. With a 3/16” Allen wrench, remove the manifold pressure tap plug located on the outlet side of the gas valve. Refer to the appropriate manufactures instruction for location.
3. A fitting, which has a 1/8” NPT pipe thread that is compatible with the pressure gauge or U-tube manometer, must be installed at this point.
4. Install the pressure gauge or U-tube manometer according to the manufacturer’s supplied instructions.
5. Set the room thermostat to a point above room temperature to start the furnace.
6. Allow the furnace to operate for three (3) minutes and then check the manifold pressure. For LP gas installations, the manifold pressure should be factory set to 9.5” WC or to 10" WC dependent upon the style of gas valve installed. If the manifold pressure is not set to the appropriate pressure, then it must be adjusted.

Adjusting the Manifold Pressure

NOTE 1: Dependent upon the gas valve manufacturer, the valve may come factory-set for a 9.5 or 10 in-WC manifold setting. Always inspect the unit rating label to determine the correct factory setting.

NOTE 2: The unit firing rate should be inspected for each installation as described in these instructions. The manifold pressure may be different then the factory setting. If the determination of the actual unit firing rate cannot be made with quality instruments, then the manifold pressure should be set to the factory setting – as shown on the unit rating label.

Manifold Pressure Adjustment, Honeywell valve:

1. If the manifold pressure must be adjusted, then remove the protective cap from the top of the High fire gas valve regulator as shown in the manufacturers instructions.
2. Turn the adjustment screw clockwise to increase the manifold pressure and counter clockwise to decrease the manifold pressure. Set the manifold pressure to the factory settings, as shown on the unit rating label – or to the correct manifold pressure setting to obtain the correct firing rate.
3. Replace the protective cap over the adjustment screws and tighten.
4. The low fire, firing rate should be 65% of the high fire, firing rate
   a. (From example 1: the furnace high fire rating of 147,000 Btuh, would have a low fire, firing rate of 95,550 Btuh. Or 0.65 x 147,000 Btuh.)

It should not be necessary to adjust the low fire regulator after the High fire setting is accomplished.

Manifold Pressure Adjustment, White Rodgers valve:

1. If the manifold pressure must be adjusted, then remove the protective cap from the top of the High fire gas valve regulator as shown in the manufacturers instructions.
2. Turn the adjustment screw clockwise to increase the manifold pressure and counter clockwise to decrease the manifold pressure. Set the manifold pressure to the factory settings, as shown on the unit rating label – or to the correct manifold pressure setting to obtain the correct firing rate.
3. Replace the protective cap over the adjustment screws and tighten.
4. The low fire, firing rate should be 60% of the high fire, firing rate

a. (From example 1: the furnace high fire rating of 147,000 Btuh, would have a low fire, firing rate of 88,200 Btuh. Or 0.60 x 147,000 Btuh.)

Inspect the unit low firing rate in the same manner described in the instructions for Verifying and Adjusting Firing Rate.

5. Use the same procedure described above in steps 1-3 for the high fire regulator to adjust the low fire manifold pressure. If the firing rate cannot be determined, set the low fire manifold pressure to the factory setting – as shown on the unit rating label, or refer to table 3.

MODEL	GAS TYPE	HEATING INPUT	HEATING OUTPUT	HEATING RISE RANGE (°F)	CFM RANGE						
					1,950	**2,100**	**2,250**	**2,400**	**2,550**	**2,700**	**SCFM**
R6GP-072*-100C	Propane	85,000	68,000	15 -45	32	30	28	26	25	23	**RISE (°F)**
					1,950	**2,100**	**2,250**	**2,400**	**2,550**	**2,700**	**SCFM**
R6GP-072*-166C	Propane	141,000	112,800	35 - 65	54	50	46	44	41	39	**RISE (°F)**
					2,425	**2,625**	**2,800**	**3,000**	**3,188**	**3,375**	**SCFM**
R6GP-090*-200C	Propane	175,000	137,000	30 - 60	52	48	45	42	40	38	**RISE (°F)**
					3,250	**3,500**	**3,750**	**4,000**	**4,250**	**4,500**	**SCFM**
R6GP-120*-235C	Propane	205,000	164,000	25 - 55	47	43	40	38	36	34	**RISE (°F)**

* At elevations of 2,000 feet or less.

Table 2. Heating Rise/Range

Unit Model Number	Gas Valve Manf.	Gas Valve Model	Maximum Inlet Pres. †	Minimum Inlet Pres. †	Factory Set, Manifold Pres. † High Fire	Factory Set, Manifold Pres. † Low Fire
R6GP-072*-100C	Honeywell	VR8205Q	14.0 (3.49)	11.0 (2.74)	10.0 (2.49)	4.0 (1.0)
R6GP-072*-166C	Honeywell	VR8205Q	14.0 (3.49)	11.0 (2.74)	10.0 (2.49)	4.0 (1.0)
R6GP-090*-200C	Honeywell	VR8205Q	14.0 (3.49)	11.0 (2.74)	10.0 (2.49)	4.0 (1.0)
R6GP-090*-200C	White Rodgers	36H64	14.0 (3.49)	11.0 (2.74)	9.5 (2.37)	5.0 (1.24)
R6GP-120*-235C	White Rodgers	36H65	14.0 (3.49)	11.0 (2.74)	9.5 (2.37)	5.0 (1.24)

† All Pressure values are expressed in: in-WC (kPa)

Table 3. Unit/Valve data - LP gas only

Removing the Pressure Gauge U-tube Manometer

Once the manifold pressure has been properly adjusted, the pressure gauge or U-tube manometer must be removed from the gas valve.

1. Turn the thermostat to its lowest setting.
2. Turn OFF the main gas supply to the unit at the manual shut-off valve, located outside of the unit.
3. Turn OFF all electrical supplies to the unit.
4. Remove the manometer adapter from the gas valve and replace it with the 1/8" NPT manifold pressure plug removed earlier. Ensure the plug is tightly sealed and not cross threaded.
5. Turn ON all electrical power to the unit.
6. Turn ON the main gas supply to the unit at the manual shut-off valve, located outside of the unit.

Completing the Conversion

1. For all R6GP/R4GN/R4GM Series conversions to LP gas, affix the conversion warning label (#703935) provided in the kit to the outside of the units louvered burner access panel. Next, affix the conversion information label (#710005) over the Natural Gas warning label. Each label shall be prominent and visible after installation.
2. Affix the gas valve manufactures labels to the valve as described in the manufactures instructions.
3. Replace the unit's louvered burner access panel.
4. Run the appliance through a complete cycle to assure proper operation.

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