INSTALLATION INSTRUCTIONS FOR HIGH ALTITUDE KITS: RXGY-F13, RXGY-F27 AND RXGY-F28

FOR TWO-STAGE (GPL/GPR/GPE/GLL/GLR/GLE) MODELS

Recognize this symbol as an indication of Important Safety Information!

⚠WARNING

THESE INSTRUCTIONS ARE INTENDED AS AN AID TO QUALIFIED, LICENSED SERVICE PERSONNEL FOR PROPER INSTALLATION, ADJUSTMENT AND OPERATION OF THIS UNIT. READ THESE INSTRUCTIONS THOROUGHLY BEFORE ATTEMPTING ANY MAINTENANCE OR OPERATION. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN IMPROPER INSTALLATION, ADJUSTMENT, SERVICE OR MAINTENANCE RESULTING IN FIRE, ELECTRICAL SHOCK, CARBON MONOXIDE POISONING, EXPLOSION, PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

FOR CANADIAN INSTALLATIONS, THE CONVERSION SHALL BE CARRIED OUT BY A MANUFACTURER'S AUTHORIZED REPRESENTATIVE, IN ACCORDANCE WITH REQUIREMENTS OF THE MANUFACTURER, PROVINCIAL OR TERRITORIAL AUTHORITIES HAVING JURISDICTION AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE CAN/CGA-B149.1 OR CAN/CGA-B149.2 INSTALLATION CODES.

RECOMMENDED TOOLS:

Slotted & Phillips screwdrivers
1/4″ Nut driver
Needle-nosed pliers
Pipe wrenches (2)
7/16″ Socket or wrench

80 plus, GPL, GPR, GPE, GLL, GLR and GLE gas furnaces installed in high elevations require the installation of a high-altitude kit for proper operation. The high altitude kit consists of a high-altitude pressure switch assembly (two pressure switches) which attaches (via a hose) to the induced draft blower. For all models listed here, a pressure switch change is required at 5000 ft.

For **ALL** furnace models, an orifice change may be necessary depending on the elevation and gas heating value. *Elevations above 2000 ft. require the furnace to be de-rated 4% per thousand feet. This means that for every thousand feet of elevation, the furnace loses 4% of its heating capacity. Burner orifices must be adjusted in order to achieve the reduced rates.* **NOTE:** Factory installed orifices are calculated and sized based on a sea level natural gas heating value of 1075 BTU per cubic ft. Regional reduced heating values may nullify the need to change orifices except at extreme altitudes. Consult the section titled *"Orifice Selection for High Altitude Applications"* of this document to determine if an orifice change will be necessary and what the new drill size will be for the orifices.

The high altitude kit consists of a high altitude pressure switch assembly that replaces the pressure switch assembly attached to the induced draft blower. The kit no longer contains additional orifices for high altitude applications as these may or may not be necessary and, if necessary, could be any of a number of different sizes. Please consult the section titled *"Orifice Selection for High Altitude Applications"* of this document for information on calculating the proper orifice drill size and where to order the necessary orifices.

KIT SELECTION: GPL/GPE/GPR/GLL/GLR/GLE HIGH ALTITUDE FIELD CONVERSION

Based on the furnace model number, the proper kit to use must be selected from the list below.

HIGH ALTITUDE KIT	-GPL, -GPR, -GPE, -GLL, -GLR, -GLE
RXGY-F13	ALL -GPL, -GPR, -GPE MODELS
RXGY-F28	-GLL, -GLR, -GLE-05, -GLL, -GLR, -GLE-07 (ALL), -GLL, -GLR, -GLE-10
RXGY-F27	-GLL, -GLR, -GLE-12

A NOTE ABOUT DIFFERENT PRESSURE SWITCH ASSEMBLIES:

There are two different possible manufacturers of pressure switch assemblies; Honeywell and MPL. For (-)GPL/(-)GPR/(-)GPE and (-)GLL/(-)GLR/(-)GLE models, the Honeywell Assembly is shown in Figure 1 and the MPL assembly is shown in Figure 2. These assemblies are interchangeable with each other. Do not be alarmed if the replacement pressure switch assembly does not exactly match the existing assembly. As long as either assembly looks like one of the assemblies in either Figure 1 or 2, there should not be a problem.

FIGURE 1
HONEYWELL PRESSURE SWITCH ASSEMBLY WITH CORRECT MOUNTING HOLES INDICATED.
NOTE: MOUNT WITH ELECTRICAL TERMINALS FACING TO THE FRONT OF THE FURNACE.

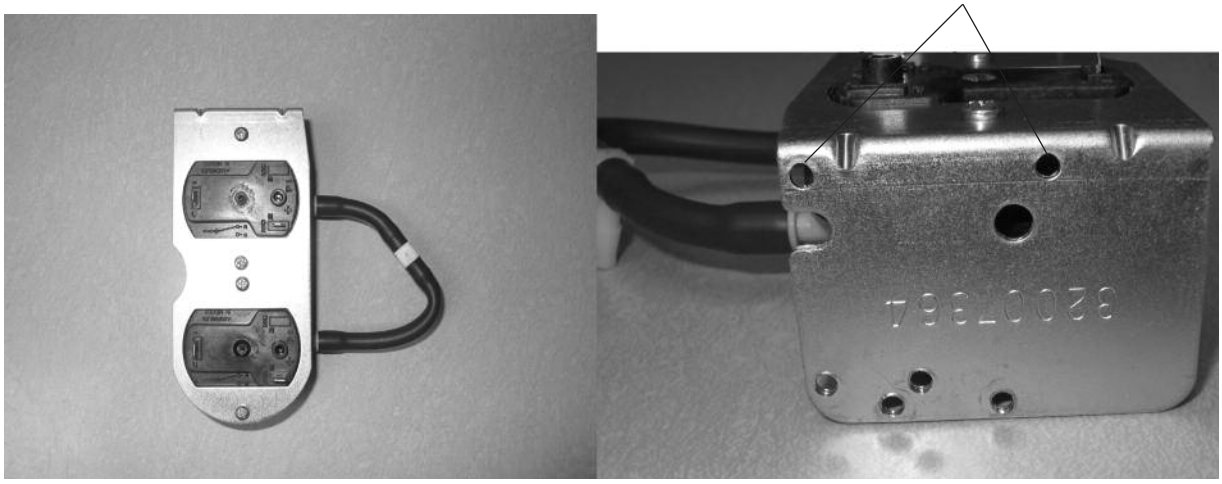
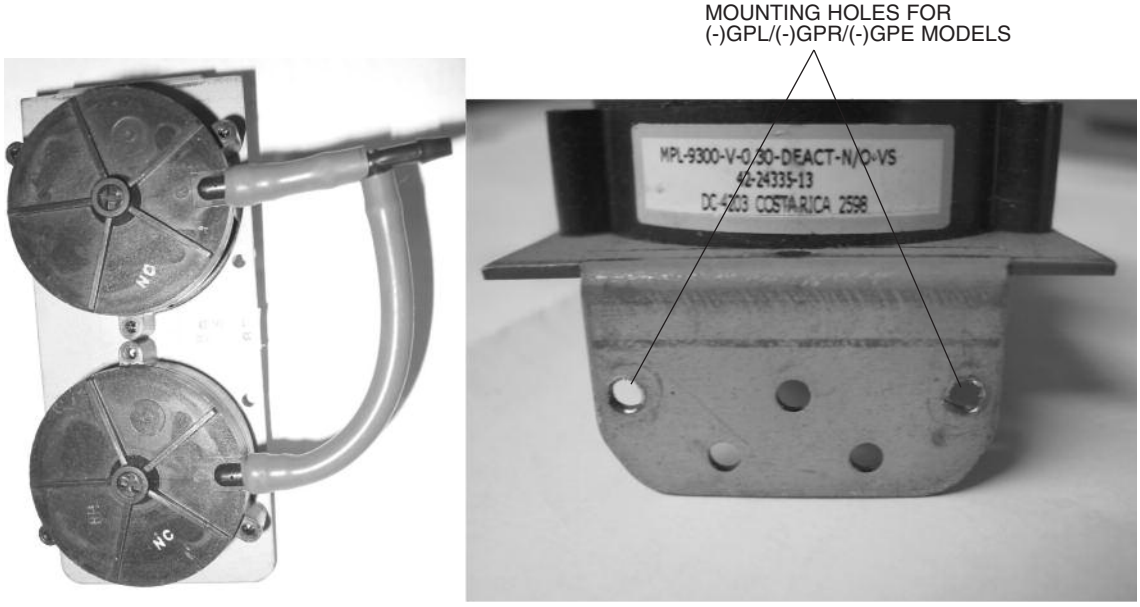


FIGURE 2
MPL PRESSURE SWITCH ASSEMBLY WITH CORRECT MOUNTING HOLES INDICATED.



PROCEDURE: CHANGING PRESSURE SWITCH ASSEMBLIES

⚠ WARNING

1. **DISCONNECT THE MAIN ELECTRICAL POWER TO THE UNIT BEFORE ATTEMPTING ANY MAINTENANCE. FAILURE TO DO SO CAN CAUSE ELECTRICAL SHOCK RESULTING IN SEVERE PERSONAL INJURY OR DEATH.**

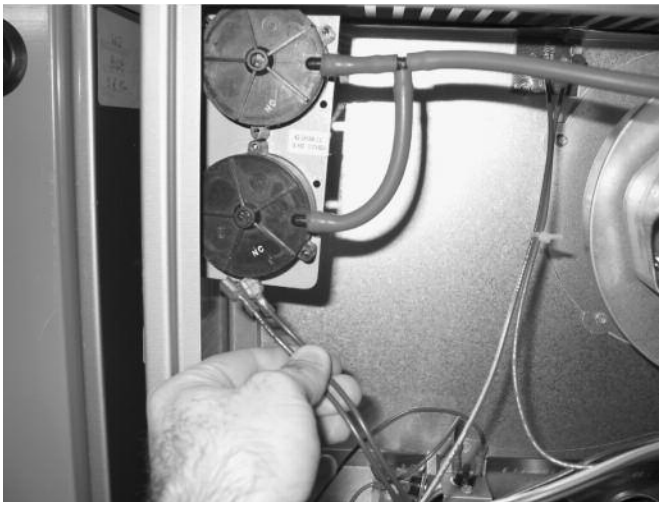
⚠ WARNING

2. **SHUT OFF THE GAS SUPPLY AT A MANUAL VALVE IN THE SUPPLY PIPING TO THE UNIT BEFORE ATTEMPTING MAINTENANCE. FAILURE TO DO SO CAN CAUSE FIRE OR AN EXPLOSION RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.**
3. Turn the thermostat to the “off” position.
4. Remove the burner door and blower door.

TO REPLACE THE PRESSURE SWITCH:

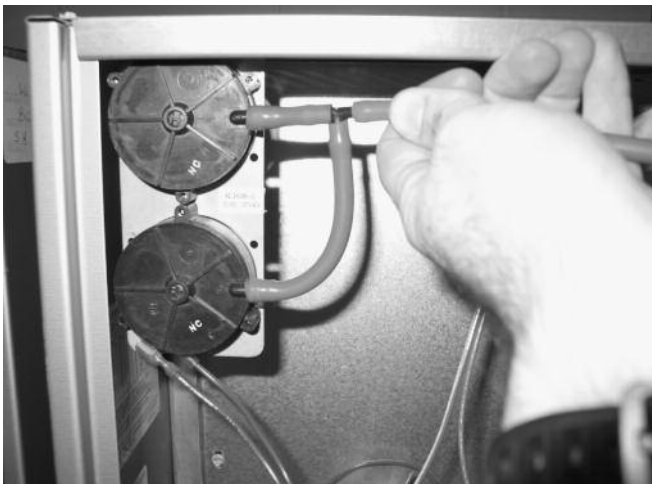
5. Remove the wiring from the existing pressure switch assembly. See Fig 3.

FIGURE 3
REMOVE WIRES FROM SWITCH ASSEMBLY (MPL ASSEMBLY SHOWN)



6. Disconnect the pressure switch hose that connects to the induced draft blower. See Figure 4.

FIGURE 4
REMOVE THE HOSE FROM THE INDUCER (MPL ASSEMBLY SHOWN)



7. Remove the pressure switch assembly by removing the two screws that attach the assembly to the top plate.
8. Use the existing screws to mount the high altitude pressure switch assembly to the top plate.
9. Reattach the hose from the induced draft blower to the replacement pressure switch assembly.
10. Reattach all wires to the replacement pressure switches. Reference the wiring diagram attached to the unit.
11. If conversion requires an orifice change, continue on to next section. If not, replace the doors, turn on the electrical power and the main gas supply to the unit. Set the thermostat at a temperature which will cause the unit to operate in heat mode. Let the furnace operate through several cycles to confirm proper operation.

AT CERTAIN ELEVATIONS, BOTH THE PRESSURE SWITCH ASSEMBLY AND THE ORIFICES MUST BE CHANGED. FOLLOWING IS A PROCEDURE FOR DETERMINING AT WHAT ELEVATION THE ORIFICES WILL NEED TO BE CHANGED AND WHAT DRILL SIZE THEY MUST HAVE. THE INSTRUCTIONS ARE BASED ON ALTITUDE AND GAS HEATING VALUE. THE INSTALLER WILL NEED TO DETERMINE BOTH THE ELEVATION AND THE HEATING VALUE (BTU/FT^3) OF THE GAS AT SEA LEVEL BEFORE MAKING THE CALCULATIONS.

ORIFICE SIZE ADJUSTMENTS NEED TO BE CALCULATED AND APPROPRIATE ORIFICES INSTALLED BASED ON THE ACTUAL HEATING VALUE AND ALTITUDE USING GUIDELINES SET FORTH BY THE *NATIONAL FUEL GAS CODE* and *NATURAL GAS AND PROPANE INSTALLATION CODE* (CANADA).

ORIFICE SELECTION FOR HIGH ALTITUDE APPLICATIONS

⚠ CAUTION

The National Fuel Gas Code (NFGC) and (for Canada) *The Natural Gas and Propane Installation Code* and *Gas-Fired Appliances for Use at High Altitudes* (CGA 2.17-M91) guidelines should be followed when converting these furnaces for high altitude operation.

TABLE 1
NATURAL GAS ORIFICE DRILL SIZE (4% PER 1000 FT. DE-RATE) BURNER INPUT (PER BURNER) 25,000 BTU @ SEA LEVEL

Annual Avg. Heat Value (btu per ft^3)	Sea level to 1999 ft.	2000 to 2999 ft.	3000 to 3999 ft.	4000 to 4999 ft.	5000 to 5999 ft.	6000 to 6999 ft.	7000 to 7999 ft.	8000 to 8999 ft.
850	38	39	40	41	41	42	42	43
900	40	41	42	42	42	43	43	44
975	41	42	42	42	43	43	44	44
1075	42	42	43	43	43	44	44	45
1170	43	44	44	44	45	45	46	47

Examples of orifice sizing using the National Fuel Gas Code Appendix F:

In addition to any necessary pressure switch changes, installations at elevations above 2000 ft. require the furnace to be de-rated 4% per thousand feet. *Note that #42 factory installed orifices are calculated and sized based on a sea level Natural Gas heating value of 1075 BTU per cubic ft. Regional reduced heating values may nullify the need to change orifices except at extreme altitudes.* Table 1 shows some quick conversions based on elevation and gas heating value. This table is combined and simplified from Tables F1 and F4 of the NFGC. **IMPORTANT:** TO CALCULATE THE NEW ORIFICE SIZE, THE EQUIVALENT HEATING VALUE OF THE GAS AT SEA LEVEL MUST BE KNOWN. THE VALUE MUST BE THAT OF SEA LEVEL BEFORE ANY CALCULATIONS ARE PERFORMED. THIS INFORMATION CAN BE OBTAINED FROM THE LOCAL GAS SUPPLIER

Example 1: 80+ Furnace w/ 900 BTU/ft³ Regional Nat. Gas Heating Value

I / H = Q
25000 / 900 = 27.78 ft³

I = Sea Level input (per burner): 25000
H = Sea Level Heating Value: 900
Q = 27.78 ft³ Natural Gas per hour.

From Table F.1 of *National Fuel Gas Code Handbook, 2002* (3.5" w.c. column).
Orifice required at Sea Level: # 40
From Table F.4 of *National Fuel Gas Code Handbook, 2002*
Orifice required at 5000 ft. elevation (4% de-rate per thousand ft): # 42
Orifice required at 8000 ft. elevation (4% de-rate per thousand ft): # 44

Example 2: 80+ Furnace w/ 1050 BTU/ft³ Regional Nat. Gas Heating Value

I / H = Q
25000 / 1050 = 23.81 ft³

I = Sea Level input (per burner): 25000
H = Sea Level Heating Value: 1050
Q = 23.81 ft³ Natural Gas per hour.

From Table F.1 of *National Fuel Gas Code Handbook, 2002* (3.5" w.c. column).
Orifice required at Sea Level: # 43
From Table F.4 of *National Fuel Gas Code Handbook, 2002*
Orifice required at 5000 ft. elevation (4% de-rate per thousand ft): # 45
Orifice required at 8000 ft. elevation (4% de-rate per thousand ft): # 47

LP Gas

LP Gas is a manufactured gas that has consistent heating value across most regions.

The National Fuel Gas Code guidelines are used with the following exception:

The recommended LP Gas high altitude orifice selections differ slightly in that the NFGC LP orifice chart, as they are not accurate for Rheem products. The National Fuel Gas Code LP orifices are based on an 11" of water column pressure at the orifice, which differs from Rheem products that use 10" of water column at the orifice. This difference requires a deviation from the NFGC orifice size reco mmendations. The Sea Level input should still be reduced by 4% per thousand ft. and the orifice size must be selected based on the reduced input selection shown in Table 2.

TABLE 2
LP GAS ORIFICE DRILL SIZE AND PER BURNER DE-RATE BY ELEVATION. BASED ON 25,000 BTU RHEEM 80+ BURNERS.

Altitude	Input (BTU per burner) 25000	Orifice Size
0 to 1999 ft	25000	#54
2000 to 2999	24000	#54
3000 to 3999	23000	#54
4000 to 4999	22000	#54
5000 to 5999	21000	#54
6000 to 6999	20000	#54
7000 to 7999	19000	#55
8000 to 8999	18000	#55
9000 to 10000	17000	#55

Orifice Ordering Information

Orifices may be ordered from Rheem/Ruud Prostock parts departments by specifying the Rheem/Ruud part number. Orifice sizes are selected by adding the 2-digit drill size required in the orifice part number. Drill sizes available are 39 though 64; metric sizes available 1.10mm (-90) and 1.15mm (-91):

Orifice Part Number 62-22175-(drill size)
Example 1:
60 drill size orifice required
Part # 62-22175-60

Example 2:
1.15mm drill size orifice required
Part # 62-22175-91

TO REPLACE THE ORIFICES:

Once it has been determined (using the methods above) that the orifices need to be changed, the following procedure should be followed to replace the orifices.

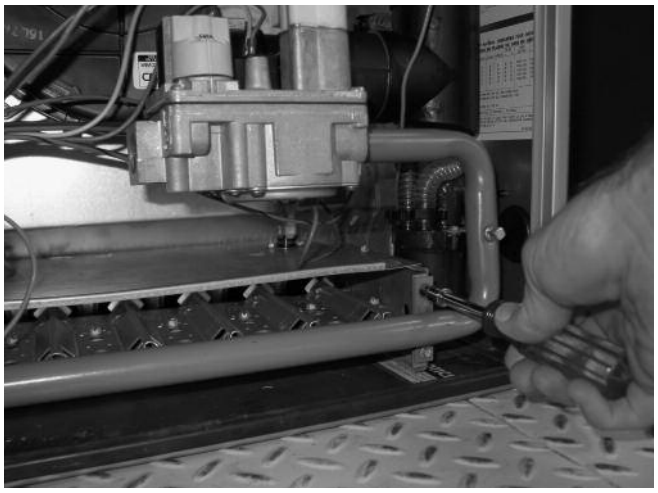
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⚠ WARNING

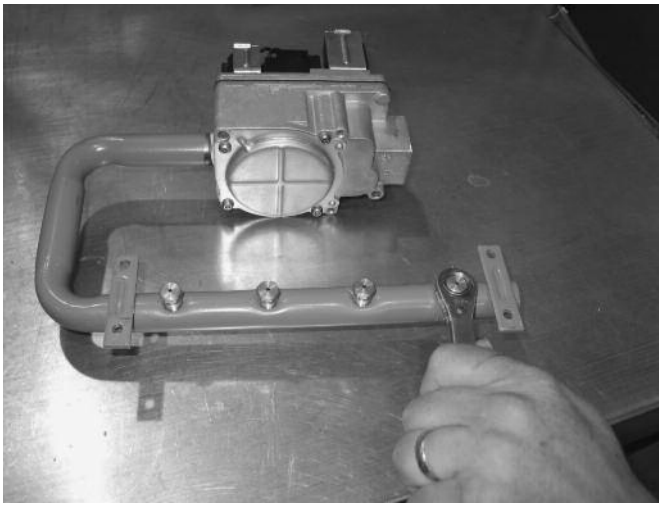
2. **SHUT OFF THE GAS SUPPLY AT A MANUAL VALVE IN THE SUPPLY PIPING TO THE UNIT BEFORE ATTEMPTING MAINTENANCE. FAILURE TO DO SO CAN CAUSE FIRE OR AN EXPLOSION RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.**
3. Disconnect the gas supply line from the system at the union inside the furnace.
4. Remove all necessary wiring to permit removal of the manifold assembly.
5. Remove the four screws holding the gas manifold to the burner brackets and remove the manifold assembly. See Figure 5.

FIGURE 5
REMOVE THE MANIFOLD ASSEMBLY



6. Remove the existing orifices from the manifold using a 7/16” socket or wrench. See Figure 6.

FIGURE 6
ORIFICE REMOVAL



7. Replace the orifices with the proper high-altitude orifices. Screw them in hand tight and secure in place (with the wrench or socket) 1/4 turn from hand tight.
8. Replace the manifold assembly on the burner assembly with the four screws removed in step 5.
9. Replace all wiring removed in step 4.
10. Re-attach the gas line at the union. Tighten securely with a pipe wrench. **IMPORTANT:** When tightening gas pipe connections, use a back-up wrench to prevent any twisting of the control assembly and/or the gas valve.
11. Turn on the gas at the manual gas valve and check for any leaks using soap and water solution or other approved method.

⚠ WARNING

DO NOT USE AN OPEN FLAME TO CHECK FOR LEAKS. USE OF AN OPEN FLAME CAN CAUSE A FIRE OR EXPLOSION RESULTING IN PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

12. Turn on the electrical power to the unit. Set the thermostat at a temperature which causes the unit to operate in the heat mode. Let the furnace operate through several cycles to confirm proper operation.

INSTALL THE CONVERSION LABEL

Once all other work has been done, install the “High Altitude Conversion Label” supplied in the kit (part number 92-101842-01). This label must be installed and properly filled out to complete the job. The label includes information about elevation, manifold pressure and etc to indicate that the furnace has been properly converted by the installer for the particular installation in question. The label must be filled out by the installer.