INSTALLATION INSTRUCTIONS

For Propane to Natural Gas Conversion Kit Model No: NAHA00701NG or Part No. (1178474)

This kit is designed to convert *9UHX and *9MPX Natural Gas furnace to Propane Gas furnace.

* Denotes Brand (T, H or C)

SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury, or property damage. Consult a qualified installer, service agency, or your distributor or branch for information or assistance. The qualified installer or agency must use factory–authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit. Consult local building codes, the current editions of the National Fuel Gas Code (NFCG) NFPA 54/ANSI Z223.1, National Electrical Code (NEC) NFPA 70.

In Canada refer to the current editions of the National standards of Canada CAN/CSA–B149.1 and .2 Natural Gas and Propane Installation Codes, and Canadian Electrical Code CSA C22.1.

Recognize safety information. This is the safety–alert symbol ⚠. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand these signal words; DANGER, WARNING, and CAUTION. These words are used with the safety–alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

CERTIFIED ®

DESIGN CERTIFIED ®

General Information

This kit is for conversion of furnaces equipped with Single Stage Honeywell VR8205S Series gas valves from propane gas to natural gas. Before the furnace can be operated with natural gas, the low inlet pressure switch must be removed. A gas valve conversion kit must be installed and main burner orifices must be replaced with orifices in this kit or with properly sized orifices for high altitude (ordered separately).

⚠ WARNING

FIRE, EXPLOSION, ELECTRIC SHOCK, AND CARBON MONOXIDE HAZARD.

This conversion kit shall be installed by a qualified service technician 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 could result causing property damage, personal injury or loss of life. The qualified service agency 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.

⚠ AVERTISSMENT

Cette trousse de conversion doit être installée par un service d'entretien qualifié, selon les instructions du fabricant et selon toutes les exigences et tous les codes pertinents de l'autorité compétente. Assurezvous de bien suivre les instructions dans cette notice pour réduire au minimum le risque d'incendie, d'explosion ou la production de monoxyde de carbone pouvant causer des dommages matériels, des blessures ou la mort. Le service d'entreien qualifié est responsable de l'installation de cette trousse. L'installation n'est pas adéquate ni complète tant que le bon fonctionnement de l'appareil convertin'a pas été vérifié selon les instructions du fabricant fournies avec la trousse.

Parts List

Description	Part#	Qty.
Burner Orifice #44	1011352	6
Honeywell Conv. Kit (396222)	330732–401	1
Label, Field Conversion	1009678	1
Label, Nat Conversion	336083–101	1
Label, Conversion	336082–101	1
Label, Derate	334836–101	1
Instructions	441 06 1083 00	1

Orifices for High Altitude Conversion
(Not included in kit)
(Refer to **Table 1** – for required orifice)

Burner Orifice #41	1096942	as required
Burner Orifice #42	1011351	as required
Burner Orifice #43	1011377	as required
Burner Orifice #45	1011353	as required
Burner Orifice #46	1011744	as required

The orifices provided in this kit are stamped to indicate the size (twist drill number). The parts list specifies the size orifices supplied in the kit. Compare the size marking on the orifices with the sizes as listed in the parts list. Make sure you have the correct main burner orifices.

Extreme care is used to assure that this kit contains the proper orifices. **Oversized orifices could result in hazardous conditions, especially if the venting is inadequate.** For that reason, we recommend that the installer check the size of the orifice with a new twist drill of the correct size. This procedure assures that the orifices provided are the correct size.

Installation

⚠ WARNING

ELECTRIC SHOCK, FIRE AND EXPLOSION HAZARD.

Failure to follow this warning could result in personal injury, death, equipment damage, and/or property damage.

Turn OFF gas supply at manual gas valve before turning OFF electric power supply and starting conversion.

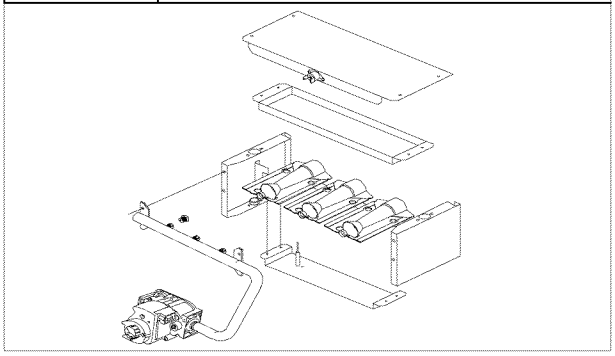
Turn OFF electric power supply at disconnect switch or service panel before starting conversion. Tag and lockout shutoff(s) with appropriate device warning labels. There may be more than one disconnect.

Disassembly

Refer to **Figure 1** and the following steps .

1. After disconnecting power and gas supply to the furnace, remove the access door, exposing gas valve and burner compartment.
2. Disconnect the yellow wire harness from the two terminals on the Propane switch, the air pressure switch, and furnace harness.
3. Reconnect yellow furnace harness wire to air pressure switch. See furnace wiring label.
4. Disconnect gas line from fitting assembly so manifold assembly can be removed.
5. Disconnect wiring at gas valve. Be sure to note the proper location of any and all electrical wiring disconnected.
6. Remove the four (4) screws holding the manifold and gas valve to the manifold supports. Do not discard any screws.
7. Carefully remove the manifold assembly and remove fitting assembly from the gas valve.
8. Unscrew the Propane pressure switch from the bushing.

Figure 1 **Disassembly**



Changing Main Burner Orifices

1. Remove the Propane (silver) orifices burner orifices from the manifold assembly and replace them with the Natural gas (typically black) furnished in the conversion kit or called out in **Table 1.** (See **Figure 2**).
2. Tighten the orifices so they are seated and gas tight about $1\,{}^{1}/_{8}''$ from the face of the orifice to the back of the manifold pipe (**Figure 3**). Make sure orifice is installed straight so that it forms a right angle (90°) to the manifold.

Figure 2 **Remove Orifices**

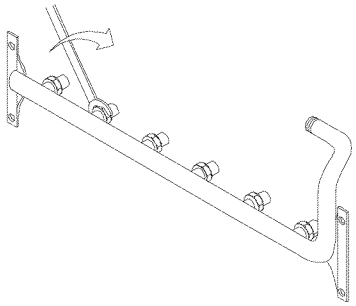
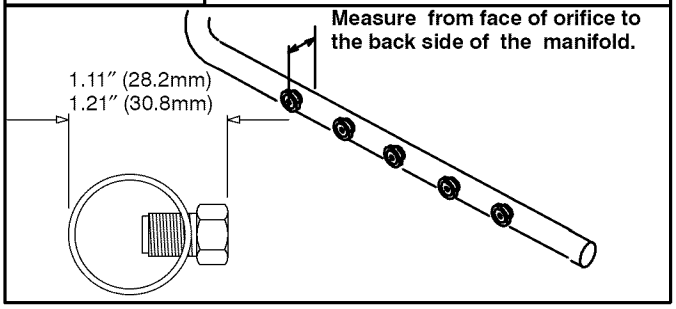


Figure 3 **Changing Orifices**



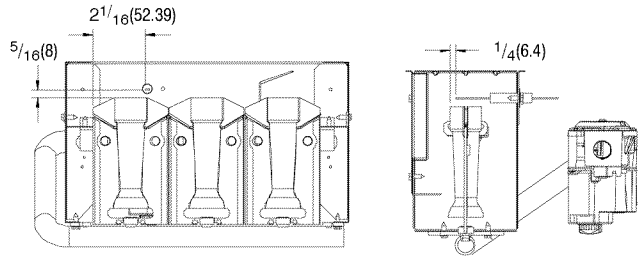
High Altitude Installation

Gas input rate on the furnace rating plate is for installation at up to 2000′. The #44 burner orifices supplied in this kit are sized for Natural Gas at full rate ONLY, for use between 0–2000′ (0–609.6m) elevation. Do not use them above 2000′ (609.6m) except when noted by **Table 1**. Orifices for conversion at high altitude must be ordered from Service Parts.

In the USA, derating of these furnaces at 2% (Natural Gas) and 4% (Propane Gas) has been tested and design-certified by CSA.

† **In Canada**, the input rating must be derated 5% (Natural Gas) and 10% (Propane Gas) for altitudes of 2,000 to 4,500 (609.6 to 1371.6m) above sea level. Use the 2001 to 3000 (609.9 to 914.4m) column in **Table 1.**

Figure 4 **Ignitor Location in(mm)**



NOTE: Flame sensor has a different orientation in all 050 and alternate 040 input models.

MANIFOLD PRESSURE AND ORIFICE SIZE

Table 1	NATURAL GAS MANIFOLD PRESSURE (in wc) 20,000 BTU per burner													
	MEAN ELEVATION FEET ABOVE SEA LEVEL ft (m)													
HEATING VALUE BTU/CU. FT.	0 to 2000 (0 to 610)		2001 to 3000† (610.1 to 914)†		3001 to 4000 (914.1 to 1219)		4001 to 5000 (1219.1 to 1524)		5001 to 6000 (1524.1 to 1829)		6001 to 7000 (1829.1 to 2134)		7001 to 8000 (2134.1 to 2438)	
	Orifice	Mnfld Press	Orifice	Mnfld Press	Orifice	Mnfld Press	Orifice	Mnfld Press	Orifice	Mnfld Press	Orifice	Mnfld Press	Orifice	Mnfld Press
700	--	--	--	--	--	--	--	--	--	--	--	--	**44**	**3.7**
725	--	--	--	--	--	--	--	--	--	--	**44**	**3.7**	**44**	**3.4**
750	--	--	--	--	--	--	--	--	--	--	**44**	**3.5**	**44**	**3.2**
775	--	--	--	--	--	--	--	--	**44**	**3.5**	**44**	**3.2**	**44**	**3.0**
800	--	--	--	--	--	--	**44**	**3.6**	**44**	**3.3**	**44**	**3.0**	**44**	**2.8**
825	--	--	--	--	**44**	**3.7**	**44**	**3.4**	**44**	**3.1**	**44**	**2.9**	**44**	**2.6**
850	--	--	--	--	**44**	**3.5**	**44**	**3.2**	**44**	**2.9**	**44**	**2.7**	**44**	**2.5**
875	--	--	**44**	**3.5**	**44**	**3.3**	**44**	**3.0**	**44**	**2.8**	**44**	**2.5**	47	3.4
900	--	--	**44**	**3.3**	**44**	**3.1**	**44**	**2.8**	**44**	**2.6**	47	3.5	48	3.6
925	**44**	**3.7**	**44**	**3.2**	**44**	**2.9**	**44**	**2.7**	**44**	**2.5**	48	3.7	48	3.4
950	**44**	**3.5**	**44**	**3.0**	**44**	**2.8**	**44**	**2.6**	47	3.4	48	3.5	48	3.3
975	**44**	**3.3**	**44**	**2.8**	**44**	**2.6**	47	3.5	48	3.7	48	3.4	49	3.6
1000	**44**	**3.2**	**44**	**2.7**	**44**	**2.5**	47	3.3	48	3.5	48	3.2	49	3.4
1050	**44**	**2.9**	**44**	**2.5**	48	3.7	48	3.4	49	3.7	--	--	--	--
1100	46	3.3	48	3.7	48	3.4	49	3.7	--	--	--	--	--	--

* When installing the *9MPX 100,000 BTU furnace only, in downflow or horizontal positions, firing rate is reduced to 19,500 BTU/cell. Subtract 0.2 in wc from the manifold pressures listed in table above for the correct manifold pressure.

Conversion: 1 in wc = 249 Pa

Bold– indicates factory orifice size.

NOTE: Natural gas data is based on 0.60 specific gravity. For fuels with different specific gravity consult the National Fuel Gas Code ANSI Z223.1–2006/NFPA 54–2006 or National Standard of Canada, Natural Gas And Propane Installation Code CSA B149.1–05.

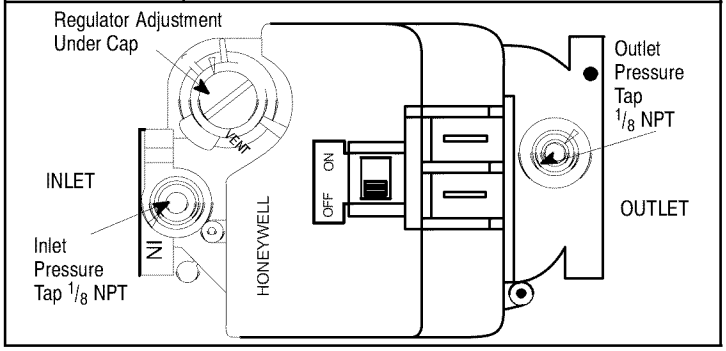
In the USA, derating of these furnaces at 2% (Natural Gas) and 4% (Propane Gas) has been tested and design–certified by CSA.

† **In Canada**, the input rating must be derated 5% (Natural Gas) and 10% (Propane Gas) for altitudes of 2,000 to 4,500 (609.6 to 1371.6m) above sea level. Use the 2001 to 3000 (609.9 to 914.4m) column in **Table 1.**

Gas Valve Conversion

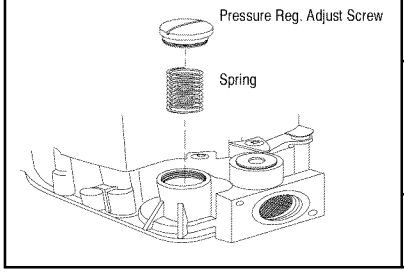
Conversion of Honeywell VR8205S Gas Valve using Natural Gas Conversion Kit# 396222.

Figure 5 **Typical Gas Control Valve**



1. Remove the regulator cap screw and pressure regulator adjusting screw. (See **Figure 5** and **Figure 6**)
2. Remove the existing regulator spring from the regulator housing.
3. Insert the replacement spring (silver color) contained in this kit into regulator housing.
4. Install the pressure regulator adjusting screw and give it six (6) full turns. This will set the manifold pressure close to required setting for normal operation.
5. Replace the regulator cap screw.
6. Attach the Caution Label contained in the kit to the Gas Valve where it can be readily seen. If Propane Conversion Label is already there, replace with new Natural Gas Caution Label.

Figure 6 **Honeywell Gas Valve VR8205S**



Color Code	Propane Gas	Natural Gas
Pressure Regulator Adjusting Screw	Black	Black
Spring	Red	Stainless Steel

Reassembly

Reassemble all parts in reverse order as removed . Attach Natural Gas Conversion Label next to the furnace rating plate or to the front exterior of the furnace. If Propane Gas Conversion Label is there replace with Natural Conversion Label.

- **Manifold Assembly** – Be sure to engage the main burner orifices in the proper openings in the burners.
- Verify the ignitor is in the correct location. (See **Figure 4**)
- **Testing for leaks** – After reassembly, turn the gas on and check all joints for gas leaks using a soapy solution. All leaks must be repaired immediately.

Gas Pressure

- Gas input to burners MUST NOT exceed the rated input shown on rating plate.
- **Do NOT** allow minimum gas supply pressure to vary downward. Doing so will decrease input to furnace. Refer to **Table 2** for gas supply and manifold pressures.

Table 2	Gas Pressures – in wc (Pa)			
Gas Type	Supply Pressure			Manifold Pressure
	Recommended	Max.	Min.	
Natural	7 in wc (1744 Pa)	14 in wc (3487 Pa)	4.5 in wc (1121 Pa)	3.5 * (872 Pa)

* See **Table 1**

Important Notes

- **Measured input can NOT exceed rated input.**
- **Any major change in gas flow requires changing burner orifice size.**

Start–up and Check–out

1. Remove the plug from the Inlet Pressure Tap on gas valve and install a manometer. (See **Figure 5**)
2. Open manual gas line valve to unit. Check for gas leaks and correct as necessary. Check supply pressure, 7 in wc (1744 Pa) recommended, 4.5 in wc (1121 Pa) minimum, 14 in wc (3487 Pa) maximum. If not within these limitations DO NOT OPERATE FURNACE, contact gas supplier.
3. Close manual gas line valve to unit, remove manometer and replace inlet pressure tap plug.

Gas Valve Adjustment

1. With the gas valve knob or switch in the OFF position, remove the pressure tap plug from the outlet end of the valve, and connect a "U" tube manometer to the pressure port. **(Figure 5)**
2. Turn the gas valve knob or switch to the ON position and restore electrical power to unit. Cycle the main burner on and off several times to stabilize the pressure regulator diaphragm. This MUST be done before an accurate pressure reading can be obtained.
3. With the main burner on, read the manometer. For appropriate reading see **Table 1**. Turn pressure regulator adjusting screw clockwise to increase or counterclockwise to decrease manifold pressure. Burner Input must not exceed nameplate rating. **Refer to Section "Checking Input Rate"**.
4. Turn gas valve to OFF. Remove the manometer and replace the pressure tap plug and pressure regulator cap screw.
5. Start the main burners and check pressure tap plug for gas leaks.
6. With gas valve on, observe furnace through two or more complete cycles to be sure all controls are operating.

Checking Input Rate

Checking Burner Input Using A Meter To check the BTU input rate, the test hand on the meter should be timed for at least one revolution and the input determined from this timing. Refer to Section 11, Table II.I.1 of the National Fuel Gas Code for converting test hand readings to cubic feet per hour.

Example (BTUH)			
Natural Gas BTU Content per cu. foot	**No. of Seconds Per Hour**	**Time Per Cubic Foot in Seconds**	**BTU Per Hour**
1,000	3,600	48	75,000
1,000 x 3,600 ÷ 48 = 75,000 BTUH			

To Determine the appliance kW input rate from a .05m^3 test dial that has been clocked at 80 seconds for one complete revolution.

Example (kW)			
Number of seconds per hour	**Number of seconds per complete rotation**	**Size of test dial (.05m^3)**	**kW m^3/h**
3,600	80	.05	2.25
3,600 ÷ 80 x .05 = 7.2 m^3/h			
2.25m^3/h x 10.35 kWh/m^3 = 23.28 kW			
23.28 x 3.412 = 79,431 BTU			

*High Altitude Input Rate = Nameplate Sea Level Input Rate x (Multiplier)	
Elevation	**High Altitude Multiplier Natural Gas* Standard Input**
0′ - 2000′ (0 – 609.6)	1.00
2001′ - 3000′ (609.9 – 914.4)†	0.95
3001′ - 4000′ (914.7 – 1219.2)	0.93
4001′ - 5000′ (1219.5 – 1524)	0.91
5001′ - 6000′ (1524.3 – 1828.8)	0.89
6001′ - 7000′ (1829.1 – 2133.6)	0.87
7001′ - 8000′ (2133.9 – 2438.4)	0.85

* Based on mid–range of elevation.

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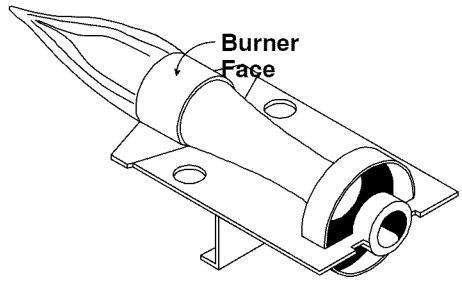
Main Burner Flame Check

Allow the furnace to run approximately 10 minutes then inspect the main burner and pilot flames. Check for the following: **(**See **Figure 7)**

- Stable and blue flames. Dust may cause orange tips or wisps of yellow, but flames **MUST NOT** have solid, yellow tips.
- Flames extending directly from burner into heat exchanger.
- Flames do **NOT** touch sides of heat exchanger

If any problems with main burner flames are noted, it may be necessary to adjust gas pressures or check for drafts.

Figure 7 | **Main Burner**



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High Altitude Derated Unit Label

The derated label supplied with the conversion kit must be completed and affixed to the furnace near the rating plate. Fill in the manifold pressure, orifice size and revised input rate.

Refer to **Table 1** provided to determine the proper orifice part numbers for ordering purposes.

Verify System Operation

Upon completion of all conversion procedures, perform the following steps to attach appropriate labels and verify the system operation.

1. Locate the Natural Gas Conversion Label next to the furnace rating plate. Replace Propane Gas Conversion Label if there.
2. Fill out and attach the Field Conversion Label to the front exterior of the furnace. Replace any existing Field Conversion Label.
3. Turn the thermostat to its lowest temperature setting or to OFF if equipped with a System Select Switch.
4. Turn the gas valve control knob or switch to ON.
5. Reinstall all access panels.
6. Turn ON all electrical power to the unit.
7. Set the thermostat to the desired temperature and the System Select Switch to HEAT.
8. Observe unit operation through two complete heating cycles. See "Sequence of Operation" in furnace installation instructions.