KGAPN41011HW

Gas Conversion Kit Propane to Natural
for 58HDX, 359AAV, PG9YAB, PG9YAA Furnaces

Installation Instructions

NOTE: Read the entire instruction manual before starting the installation.

SAFETY CONSIDERATIONS

⚠ WARNING

FIRE, EXPLOSION, ELECTRICAL SHOCK, AND CARBON MONOXIDE POISONING HAZARD

This conversion kit shall be installed by a qualified service agency 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, explosion, or production of carbon monoxide may 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.

⚠ AVERTISSEMENT

AVERTISSEMENT: LE FEU, L'EXPLOSION, CHOC ELECTRIQUE,ET MONOXYDE DE CARBONE EMPOISONNER

Cette trousse de conversion doit être installée par un servie 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'entretien 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 converti n'a pas été vérifié selon les instructions du fabricant fournies avec la trousse.

Installing and servicing heating equipment can be hazardous due to gas and electrical components. Only trained and qualified personnel should install, repair, or service heating equipment.

Untrained personnel can perform basic maintenance functions such as cleaning and replacing air filters. All other operations must be performed by trained service personnel. When working on heating equipment, observe precautions in the literature, on tags, and on labels attached to or shipped with the unit, and other safety precautions that may apply.

Follow all safety codes. In the United States, follow all safety codes including the current edition of the National Fuel Gas Code (NFGC) NFPA No. 54-2006/ANSI Z223.1. In Canada, refer to the National Standard of Canada, Natural Gas and Propane Installation Codes (NSCNGPIC), CAN/CSA-B149.1.

Wear safety glasses and work gloves. Have a fire extinguisher available during start-up, adjustment procedures, and service calls.

Recognize safety information. This is the safety-alert symbol ⚠. When you see this symbol on the furnace and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, CAUTION, and NOTE. The words DANGER, WARNING, and CAUTION 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.

⚠ WARNING

FIRE, EXPLOSION, ELECTRICAL SHOCK AND CARBON MONOXIDE POISONING HAZARD

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

Improper installation, adjustment, alteration, service, maintenance, or use can cause carbon monoxide poisoning, explosion, fire, electrical shock, or other conditions which could result in personal injury or death. Consult your distributor or branch for information or assistance. The qualified installer or agency must use only factory-authorized kits or accessories when servicing this product.

DESCRIPTION AND USAGE

This conversion kit shall be installed by a qualified service agency. Please read these instructions completely before attempting installation. Consult gas supplier and tables in National Fuel Gas Code NFPA 54/ANSI Z223.1, 2006 or latest edition. In Canada, the National Standard CAN/CGA B149-1 and B149-2.

Parts List		
Description	Part No.	Qty.
Burner Orifice #44	1011352	6
Honeywell Conversion Kit #396222	330732–401	1
Label, Field Conversion	1009678	1
Label, Nat Conversion	336087–101	1
Label, Conversion	336086–101	1
Label, Derate	334836–101	1
Instructions	IIKKGAPN4101-001	1

Orifices for High Altitude Conversion (Not included in kit)	
(Refer to Table 1 for required orifice)	
Burner Orifice #41	333730–701 as required
Burner Orifice #42	333730–702 as required
Burner Orifice #43	333730–703 as required
Burner Orifice #45	333730–705 as required
Burner Orifice #46	333730–706 as required

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).

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 property damage, equipment damage, personal injury and/or death.

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 and tag disconnect switch and gas valve with a suitable warning label.

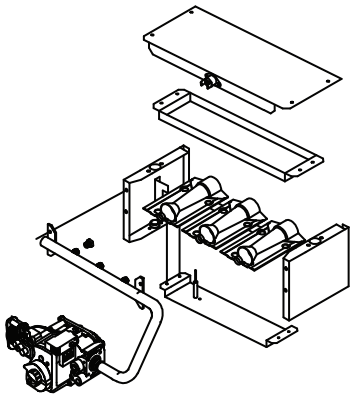

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Fig. 1 – Disassembly

DISASSEMBLY

Refer to Fig. 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 wire harness 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 gas valve.
8. Unscrew the Propane pressure switch from the bushing.

Table 1—Natural Gas Manifold Pressure (in wc) 20,000 BTU per Burner*

HEATING VALUE BTU/CU. FT.	MEAN ELEVATION FEET ABOVE SEA LEVEL Ft. (M)													
	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 58HDX / 359AAV / PG9YAB 100,000 BTU furnace in downflow or horizontal positions, firing rate is reduced to 19,500 BTU/cell. Subtract 0.2" 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/NFPA 54 or National Standard of Canada, Natural Gas And Propane Installation Code CSA B149.1.

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.

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 Fig. 2.

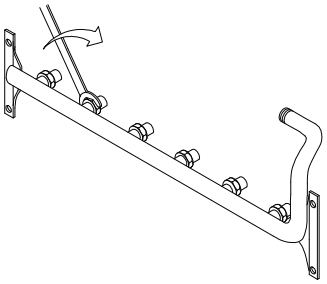

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Fig. 2 – Remove Orifices

2. Tighten the orifices so they are seated and gas tight about 1-1/ 8 in. (29 mm) from the face of the orifice to the back of the manifold pipe (See Fig. 3.) Make sure orifice is installed straight so that it forms a right angle (90°) to the manifold.

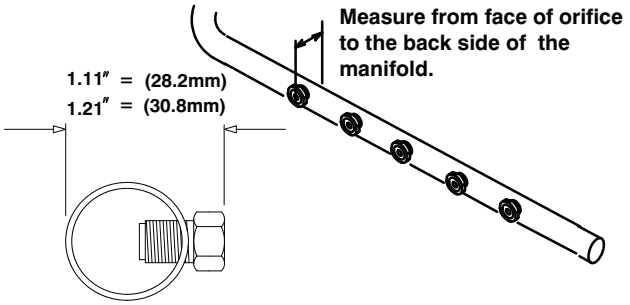

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Fig. 3 – Changing Orifices

HIGH ALTITUDE INSTRUCTIONS

Gas input rate on furnace rating plate is for installation at altitudes up to 2,000 ft. (610 M). The #44 burner orifices supplied in this kit are sized for Natural Gas at full rate ONLY, for use between 0 to 2,000 ft. (0 to 610 M) elevation. Do NOT use them at elevations above 2,000 ft. (610 M) except when noted by Table 1.

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 (610 to 1372 M) above sea level. Use the 2001 to 3000 (610 to 914 M) column in Table 1.

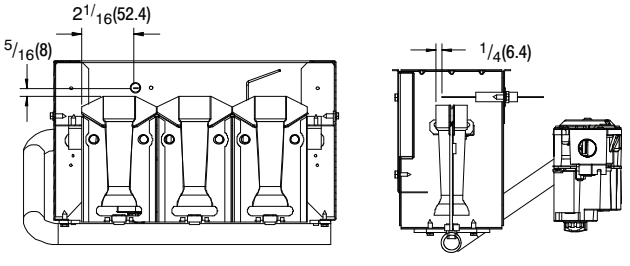

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Fig. 4 – Igniter Location

GAS VALVE CONVERSION

Conversion of Honeywell VR8205S gas valve using Natural gas conversion Kit # 396222.

1. Remove the regulator cap screw and pressure regulator adjusting screw. (See Fig. 5 and Fig. 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.

REASSEMBLY

Reassemble all parts in reverse order as removed. Attach Natural Gas Conversion Label next to the furnace rating plate or to the exterior of the furnace. If propane Gas Conversion Label is there, replace with Natural Gas 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 Fig. 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 in. wc* (872 Pa)
Important Notes Measured input can NOT exceed rated input. Any major change in gas flow requires changing burner orifice size.				

* See Table 1

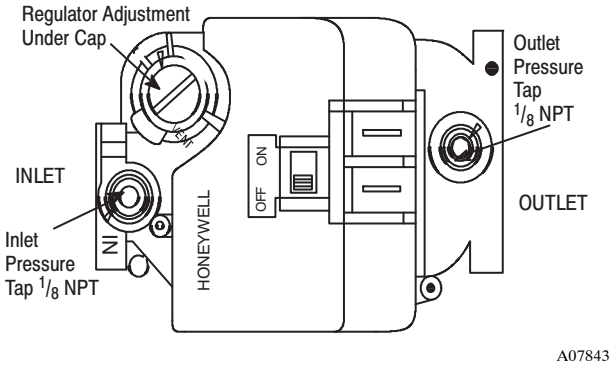

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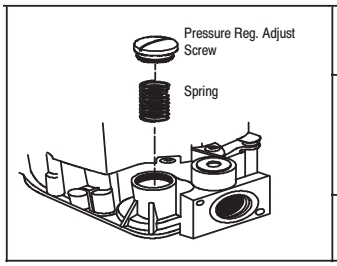
Fig. 5 – Typical Gas Control Valve



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

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Fig. 6 – Honeywell Gas Valve VR8205S

START-UP AND CHECK-OUT

1. Remove the plug from the Inlet Pressure Tap on gas valve and install a manometer. (See Fig. 5.)
2. Open manual gas line valve to unit. Check for gas leaks and correct as necessary. Check supply pressure, 7 in. wc recommended, (4.5 in. wc minimum, 14 in. 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. (See Fig. 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 11.1.1 of the National Fuel Gas Code for converting test hand readings to cubic feet per hour.

EXAMPLE (BTUH)			
Natural Gas BTU Content per cu. ft.	No. of Seconds per Hour	Time Per Cubic Feet in Seconds	BTU Per Hour
1,000	3,600	48	75,000

Example: 1,000 BTU x 3,600/48 = 75,000 BTU/hour

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	No. 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)

ALTITUDE FT (M)	DERATE MULTIPLIER FACTOR FOR USA*†
0–2000 (0–610)	1.00
2001–3000 (610–914)	0.95
3001–4000 (914–1219)	0.93
4001–5000 (1219–1524)	0.91
5001–6000 (1524–1829)	0.89
6001–7000 (1829–2134)	0.87
7001–8000 (2134–2438)	0.85

* Based on mid–range of elevation.
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 to1371.6m) above sea level. Use the 2001 to 3000 (609.9 to 914.4m) column in Table 1.

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 Fig. 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.

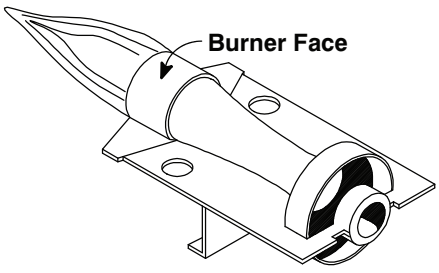

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Fig. 7 – Main Burner

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 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. Complete 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 (2) complete heating cycles. See “Sequence of Operation” in furnace intallation instructions.

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