

40,000-130,000 Btu/hr
Part Number:
CPNGCONV004C00

SMALL PACKAGED PRODUCTS
ACCESSORY NATURAL GAS CONVERSION KIT
STANDARD ALTITUDE ONLY 0-2000 FT (0-610 m)

Installation Instructions

This kit is used on:

Two-Stage (2 - 5 Tons) Models: 48DU, 48DT, 48VG (208/230 VAC models), 48VR, 48XL, 48XT, 577B, 577D, 577E (208/230 VAC models), 677B, 677D and 677E. (Two-Stage conversion starts on Page 2.)

Single-Stage (2 - 5 Tons) Models: 48ES, 48EZ, 48VG (460 VAC models), 48VL, 48VT, 574D, 577C, 577E (460 VAC models), 674D, 677C, PY3G and PY4G. (Single-Stage conversion starts on Page 10.)

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

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. Have a 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 (NFGC) NFPA 54/ANSI Z223.1, and the 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.

WARNING

FIRE, EXPLOSION, CARBON MONOXIDE POISONING, PROPERTY DAMAGE HAZARD

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

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. 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 furnace is checked as specified in the manufacturer's instructions supplied in the kit.

AVERTISSEMENT

FEU, EXPLOSION, EMPOISONNEMENT PAR CARBON DE MONOXYDE, RISQUE DE DOMMAGE À LA PROPRIÉTÉ

La négligence de suivre l'avis suivant, peut causer des blessures personnelles, la mort ou du dommage à la propriété.

Cette trousse de conversion doit être installée par un Entrepreneur qualifié, selon les instructions du fabricant et doit se conformer à toutes les exigences et tout les codes pertinents de l'autorité compétente. L'Entrepreneur qualifié est responsable, et doit s'assurer de bien suivre les instructions dans cet avis. L'installation sera considérée conforme et rencontrant les spécifications et instructions du fabricant qui sont inclus dans la trousse, seulement après vérification de l'opération de la fournaise convertie.

Table 1 – Two-Stage Kit Contents

ITEM	PART NO.	QUANTITY
Installation Instructions	IJK-CPNGCONV-06	1
Natural Gas Orifice #31*	LH32RF120	3
Natural Gas Orifice #33*	LH32RF113	3
Natural Gas Orifice #38*	LH32RF102	3
Natural Gas Orifice #44*	LH32RF086	3
Regulator Spring (F92-0953)	EF39ZW037	2
Natural Conversion Label (Rating Plate)	50CY502883	1
Natural Conversion Label (Installer Responsibility)	50CY502884	1
Natural Conversion Warning Label (Gas Valve)	48VG400076	1
1/8-in. Pipe Plug	CA64AS001	1

*Refer to Table 4 to determine the correct orifice to use.

CPNGCONV

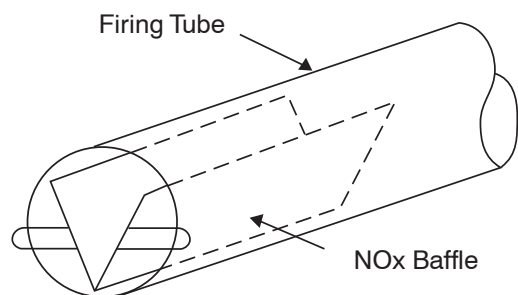
⚠ CAUTION

UNIT “RED TAG” HAZARD

Failure to follow this caution may result in local or state fines or legal consequences.

Failure to install proper baffles in this unit will violate applicable laws regulating NOx emissions in those districts.

CALIFORNIA INSTALLATIONS ONLY: When this unit is operated with natural gas fuel in certain State of California Air Quality Management Districts, the firing tubes must be equipped with V-shaped NOx baffles to reduce NOx emissions below mandated limits. This unit was originally factory equipped to operate with natural gas fuel and NOx baffles, but the baffles were removed during field conversion to propane gas. These baffles **MUST** be reinstalled as shown in Fig. 1. If the original baffles are no longer available, order replacement baffles from the factory.



A01051

**Fig. 1 - Low NOx Baffle Location
(California Installations Only)**

⚠ WARNING

EXPLOSION, PERSONAL INJURY HAZARD

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

This unit is designed to operate at 3.5 IN. W.C. (+/- 0.3 IN. W.C.) of manifold pressure on high stage with natural gas. Refer to Table 4 for proper manifold pressure settings for high stage and low stage.

TWO-STAGE KIT INTRODUCTION

These instructions cover the installation of a natural gas conversion kit on models 48DT, 48DU, 48VG (208/230 VAC models), 48VR, 48XL, 48XT, 577B, 577D, 577E (208/230 VAC models), 677B, 677D and 677E that are equipped with a White Rodgers 2-stage combination automatic gas valve regulator.

DESCRIPTION AND USAGE

This Two-Stage kit is applicable to units with heating inputs from 40,000 to 130,000 Btu/hr installed at standard altitudes from 0 ft to 2000 ft (0-610 m). It cannot be used for high altitude installation. For high altitude conversion, please contact your local supplier. All such units were factory equipped to operate on natural gas, but may have been field converted to operate on propane gas. This kit restores the unit to original factory conditions.

TWO-STAGE KIT INSTALLATION

⚠ WARNING

FIRE, EXPLOSION, ELECTRICAL HAZARD

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

Gas supply **MUST** be shut off before disconnecting electrical power and proceeding with conversion.

Before installing or servicing system, always turn off main power to system. There may be more than one disconnect switch. Lock out and tag disconnect switch with suitable warning label.

1. Turn off gas supply first, then power to unit.
2. Remove the control access panel from unit.
3. Disconnect the gas pipe from the gas valve.
4. Remove the screw attaching the gas manifold to the basepan, and partially slide out the entire burner rack assembly from unit. Save screw. The fan partition mounting bracket may be removed for easier access to the burner assembly. The bracket may be removed by removing 2 screws (located on the left side of the control compartment on the fan partition panel) and sliding the bracket forward, bottom first. See Fig. 5.
5. Disconnect the gray, blue, brown and green/yellow wires from the gas valve and remove violet or blue wires from the rollout switch.

NOTE: To locate rollout switch, see Fig. 8.

6. Disconnect orange sparker cable from the sparker.
7. Disconnect white flame sensor wire from the flame sensor.
8. Disconnect low gas pressure switch (see Fig. 11).
9. Remove the ground screw securing the brown wire from the burner assembly. Ground screw is attached to the fan partition. Save screw.
10. Completely slide out the entire burner rack assembly from unit.
11. Using a 5/16 in. nut driver, remove the four screws securing the manifold/gas valve assembly to the burner assembly. Save these screws.
12. For 2-stage 40,000 Btu/hr and 60,000 Btu/hr only (see Fig. 7). Remove the burners from the rack, save the screws.

Remove the snap ring from the end of each burner. Remove burner insert in the end of each burner. Replace the snap ring insert (see Fig. 7 for correct orientation). Replace the burners in the rack using the saved screws, making sure closed crossovers of burners are at each end.

13. If there is a low gas pressure switch mounted to the gas valve (see Fig. 10) it must be removed. Disconnect all of the 1/8-in. NPT pipe fittings leading back to the gas valve. Plug the open hole in the gas valve with the 1/8-in. pipe plug contained in this kit. Use a suitable pipe sealant (field-supplied, must be certified for use with natural gas) to prevent leakage of combustible gas.
14. Remove the propane gas orifices from the manifold using a 9/16 in. wrench and install the correct natural gas orifices in the manifold (see Table 4 to select correct orifice size based on rated input. See Fig. 3 and 6 for orifice installation).
15. Replace the manifold/gas valve assembly into the burner assembly using the four screws saved from step 11.
16. Remove regulator cover screws for both high and low stage gas regulators (see Fig. 2). Save regulator cover screws.

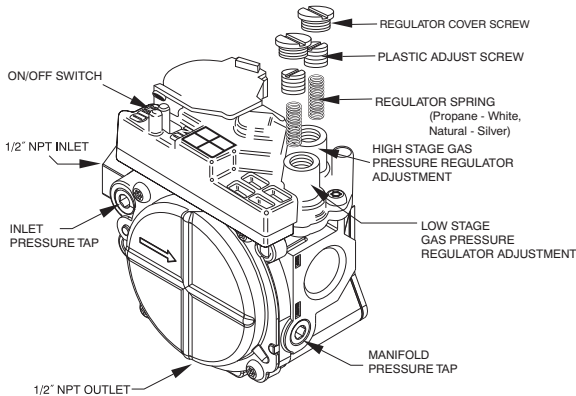


Fig. 2 - Two-Stage Gas Valve

17. Using a screwdriver, remove plastic adjust screws from both high and low stage gas regulators (see Fig. 2). Save plastic adjust screws.
18. Remove regulator springs (white) from both high and low stage gas regulators (see Fig. 2). Discard regulator springs.
19. Install natural gas regulator springs (silver) shipped with this kit. One into the low stage gas regulator and one into the high stage gas regulator (see Fig. 2).
20. Install plastic adjust screw into the high stage gas regulator, turn clockwise 12 turns (see Fig. 2).
21. Install plastic adjust screw into the low stage gas regulator, turn clockwise 9 turns (see Fig. 2).
22. Verify igniter, flame sensor, orifice/main burner relationship prior to completing conversion. (See Fig. 3.) Partially slide burner rack assembly into unit.
23. Reconnect the violet or blue wires removed in step 5 to the rollout switch and reinstall the rollout switch.
24. Reconnect the orange wire removed in step 8, to the combustion air pressure switch.
25. Reconnect orange sparker cable to sparker and reconnect the white flame sensor wire to the flame sensor.
26. Reconnect the remaining wires removed in step 5 to the gas valve. Connect the gray wires to (HI). Connect the blue wires to (M). Connect the brown and green/yellow wires to (C).
27. Slide burner rack assembly into base pan. Align burner rack with screws on sheet metal partition and slide assembly back tight to the partition. Replace the screw attaching the

burner rack to the base pan removed in step 4. If the Fan partition mounting bracket was removed, slide bracket back into place and fasten with 2 screws. (See Fig. 5.)

28. Reconnect the brown wire from the burner assembly to the fan partition panel, using the ground screw saved from step 9.
29. Remove the 1/8 in. pipe plug on the gas manifold and connect a pressure manometer (see Fig. 4).

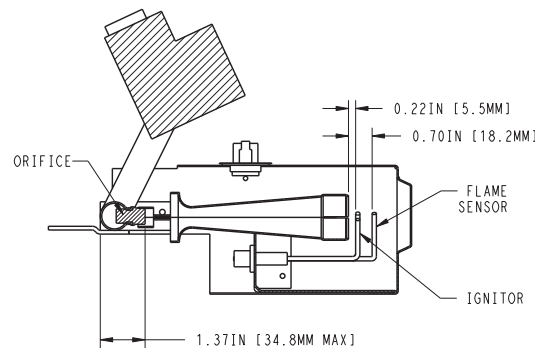
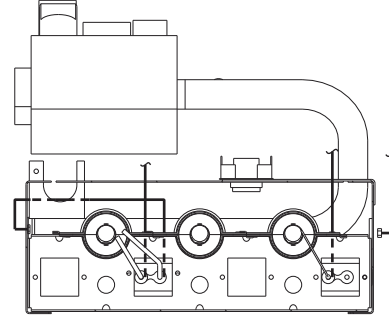


Fig. 3 - Two-Stage Igniter, Flame Sensor, Orifice/Main Burner Relationship

30. Reconnect electrical power and gas supply to the unit. For natural gas applications, the inlet gas pressure must not be less than 7.0 IN. W.C. or greater than 10.5 IN. W.C. at the unit connection. A 1/8 in. NPT plugged tapping, accessible for test gauge connection, must be installed immediately upstream of the gas supply connection to the gas valve and downstream of the manual equipment shutoff valve.

IMPORTANT: Restart unit and leak check all gas connections including the main service connection, gas valve, gas spuds, and manifold pipe plug. All leaks must be repaired before firing unit.

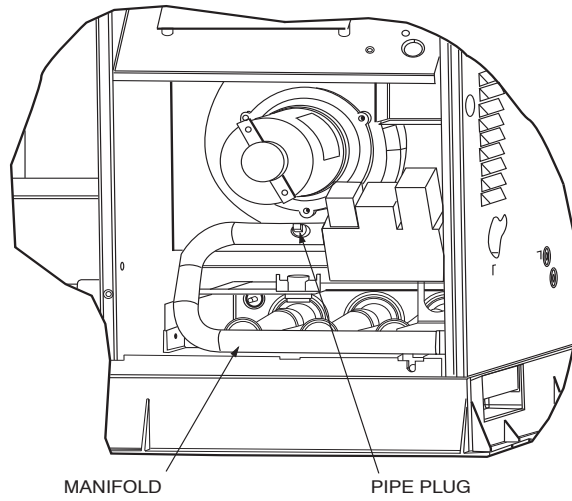
⚠ WARNING

FIRE AND EXPLOSION HAZARD

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

Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections. A fire or explosion may result causing property damage, personal injury or loss of life.

31. Fire unit and verify proper ignition and proper sequence of operation (Table 2). See Table 4 for proper manifold pressure setting for your unit. Adjust the gas valve setting by turning the plastic adjustment screw clockwise to increase pressure and counter-clockwise to decrease pressure. Refer to Table 3 for required rated heating input rates. Replace regulator cover screw when finished (see Fig. 12).

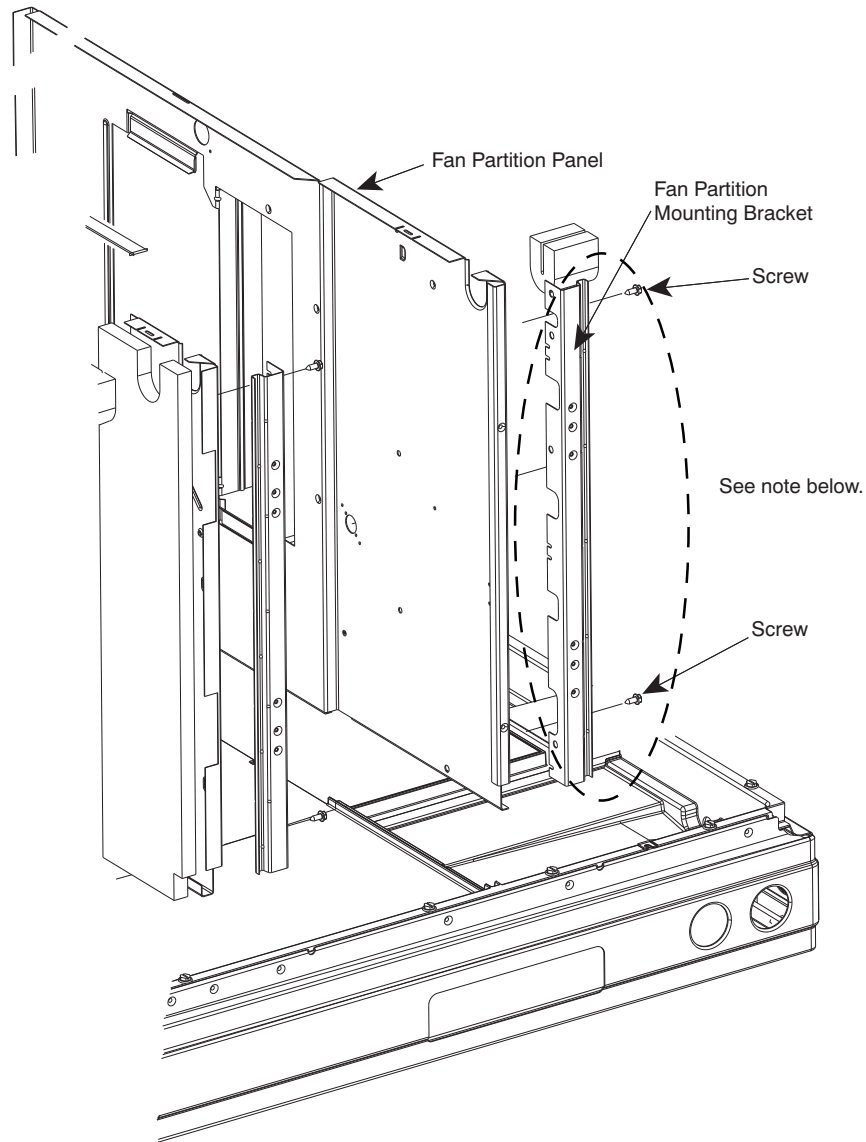


MANIFOLD

PIPE PLUG

Fig. 4 - Two-Stage Burner Assembly

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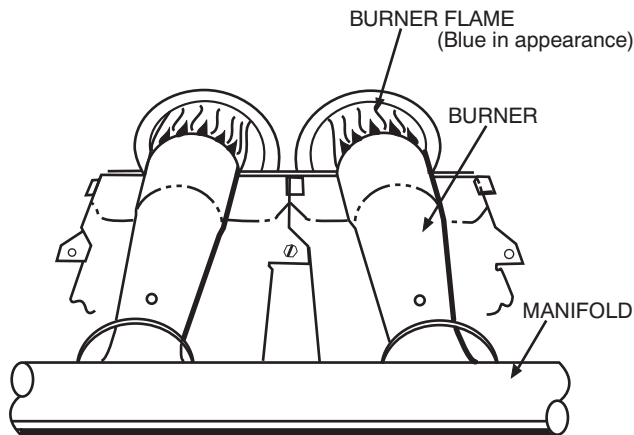


NOTE: The fan partition bracket may be removed for easier access to the burner assembly. The bracket may be removed by removing 2 screws on the control side and sliding the bracket forward, bottom first.

If the fan partition bracket was removed, slide bracket back into place and fasten with 2 screws.

Fig. 5 - Fan Partition Bracket Removal

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C99021

Fig. 6 - Monoport Burner

Table 2 – Two-Stage Sequence of Operations

Inducer Pre-Purge Period: When the inducer motor comes up on high speed, the pressure switch closes, and the Infinity™ ignition control on the furnace board begins a 15 sec pre-purge period. If the pressure switch fails to remain closed, the inducer will remain running. After the pressure switch recloses, the Infinity ignition control will begin a 15 sec pre-purge period.
Trial-for-Ignition Sequence: The spark igniter will spark for 3 sec, the main gas valve relay contact closes to energize the gas valve on low stage. After 5 sec, the igniter is de-energized and a 2-sec flame-proving period begins.
NOTE: The unit always lights on high speed inducer and low stage gas valve operation.
Flame-Proving: When the burner flame is proved at the flame-proving sensor, the furnace control determines what heating stage to run based on feedback from the User Interface (UI). If the UI is asking for low stage gas heat, the ignition control will change the inducer speed to low speed and keep the gas valve energized on low stage. If the UI is asking for high stage gas heat, the ignition control will maintain running the inducer on high speed and energize the gas valve's high stage relay to increase gas flow.

Table 3 – Two-Stage Rated Heating Input, Natural Gas (0-2000 ft [0-610 m] Altitude)

NAMEPLATE INPUT, HIGH STAGE (BTU/HR)	RATED HEATING INPUT NATURAL (BTU/HR)	
	HIGH STAGE	LOW STAGE
40,000	40,000	26,000
60,000	60,000	39,000
90,000	90,000	58,500
115,000	115,000	75,000
127,000	127,000	84,500
130,000	130,000	84,500

Verify natural gas high stage input rate.

- a. Turn off all other gas appliances and pilots served by the gas meter.
- b. If unit is not running, set unit to run for 20 minutes in high stage gas heat operation using the “INSTALLER CHECKOUT” menu on the UI.
- c. Record number of seconds for gas meter to complete 1 revolution.
- d. Divide number of seconds in step c, into 3600 (number of seconds in 1 hour).
- e. Multiply result of step d. by the number of cubic feet shown for one revolution of test dial to obtain cubic feet of gas flow per hour.
- f. Multiply result of step f. by Btu heating value of the gas to obtain total measured input shown in Table 4.
(Consult the local gas supplier if the heating value of gas is not known).

EXAMPLE: Assume a 90,000 high stage input unit is being installed. Assume that the size of the dial is 2 cubic ft., one revolution takes 84 seconds, and the heating value of the gas is 1025 Btu/ft³. Proceed as follows:

- a. 84 seconds to complete one revolution
- b. $3600/84 = 42.9$
- c. $42.9 \times 2 = 85.8 \text{ ft}^3 \text{ of gas flow/hr.}$
- d. $85.8 \times 1050 = 90,090 \text{ Btuh input.}$

In this example, the nominal input rate for high stage is 90,000 Btu/hr, so the high stage manifold pressure is correctly set. If the measured high stage rate is too low, increase the manifold pressure to increase rate. If the measured high stage rate is too high, decrease the manifold pressure to decrease rate.

NOTE: Double-check the User Interface is running on high stage gas heat while clocking the low stage firing rate.

Verify natural gas low stage input rate.

- a. Turn off all other gas appliances and pilots served by the gas meter.
- b. If unit is not running, set unit to run for 20 minutes in low stage gas heat operation using the “INSTALLER CHECKOUT” menu on the UI.
- c. Record number of seconds for gas meter to complete 1 revolution.

- d. Divide number of seconds in step c, into 3600 (number of seconds in 1 hour).
- e. Multiply result of step d. by the number of cubic feet shown for one revolution of test dial to obtain cubic feet of gas flow per hour.
- f. Multiply result of step f. by Btu heating value of the gas to obtain total measured input shown in Table 4.
(Consult the local gas supplier if the heating value of gas is not known).

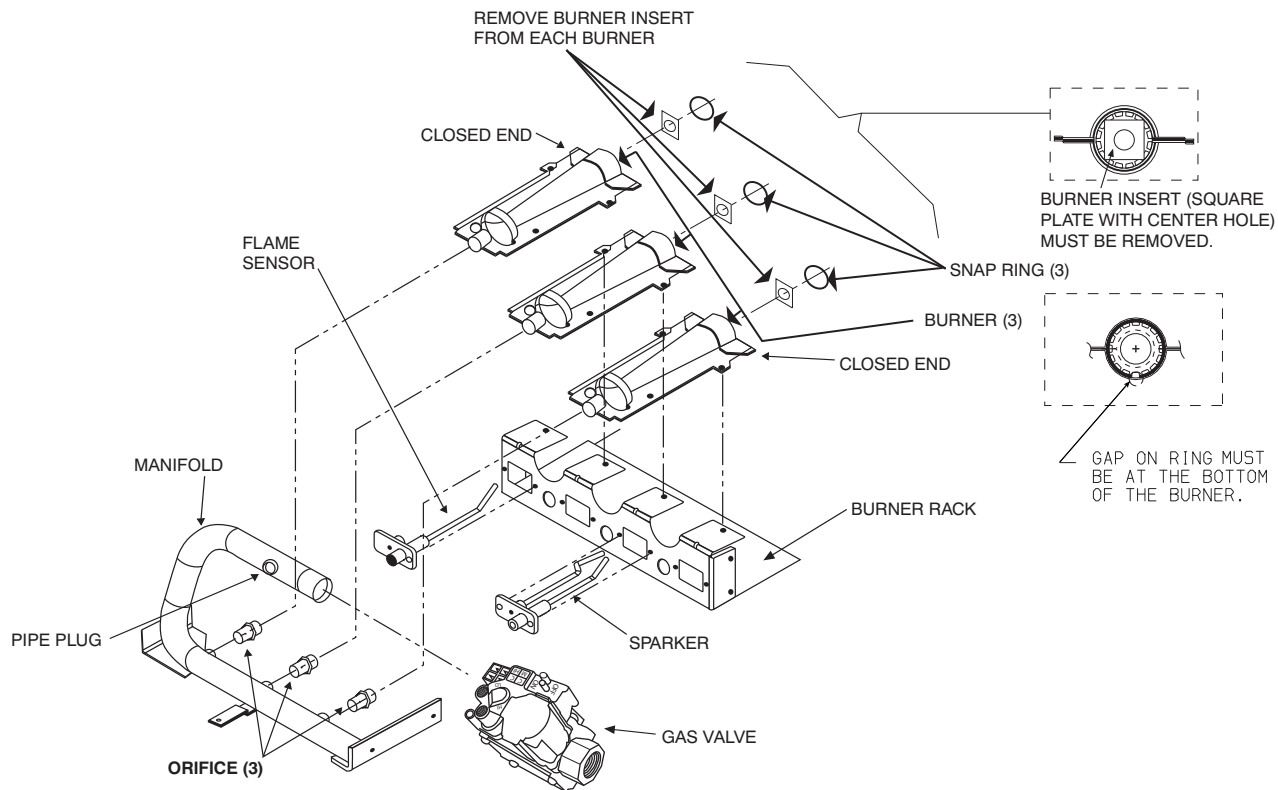
EXAMPLE: Assume a 90,000 high stage input unit is being installed. Assume that the size of the dial is 2 cubic ft., one revolution takes 129 seconds, and the heating value of the gas is 1025 Btu/ft³. Proceed as follows:

- a. 129 seconds to complete one revolution
- b. $3600/129 = 27.9$
- c. $27.9 \times 2 = 55.8 \text{ ft}^3 \text{ of gas flow/hr.}$
- d. $55.8 \times 1050 = 58,590 \text{ Btuh input.}$

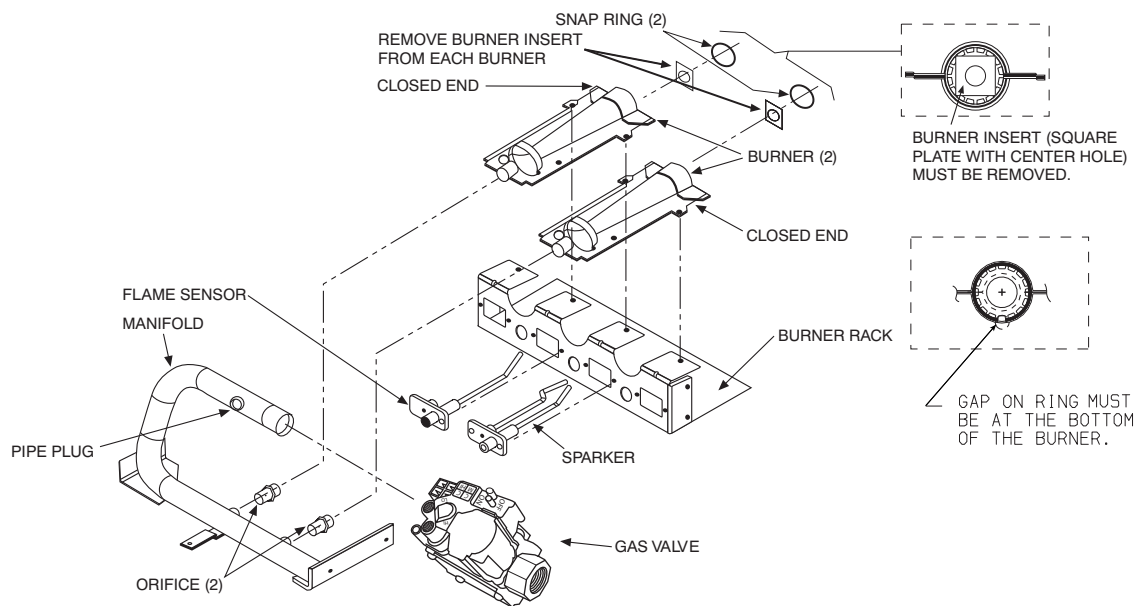
In this example, the nominal input rate for low stage is 58,590 Btu/hr, so the low stage manifold pressure is correctly set. If the measured low stage rate is too low, increase the manifold pressure to increase rate. If the measured low stage rate is too high, decrease the manifold pressure to decrease rate.

NOTE: Double-check the User Interface is running on low stage gas heat while clocking the low stage firing rate.

32. With control access panel removed, observe unit heating operation in both low stage operation and high stage operation. Watch burner flames to verify that they are blue in appearance, and that the flames are approximately the same for each burner (see Fig. 5).
33. Turn off unit, remove pressure manometer and replace the 1/8 in. pipe fitting on the gas manifold (see Fig. 4).
34. Attach warning label (P/N 48VG400076) to visible side of gas valve.
35. Attach conversion label (P/N 50CY502883) above unit rating plate on exterior of unit.
36. Attach completed conversion responsibility label (see Fig. 8, P/N 50CY502884) inside control access panel.
37. After all leaks are eliminated, replace control access panel.



3-CELL 60,000 BTUH UNITS



40,000 BTUH UNITS

Fig. 7 - Burner Insert Removal and Orifice Installation

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Table 4 – Natural Gas Orifice Sizes and Manifold Pressures

NATURAL GAS CONVERSION KIT RATING PLATE - CARRIER CORP.

THIS APPLIANCE HAS BEEN CONVERTED TO USE NATURAL GAS FOR FUEL. REFER TO KIT INSTRUCTIONS FOR CONVERSION PROCEDURES. USE PARTS SUPPLIED BY CARRIER CORPORATION AND INSTALLED BY QUALIFIED PERSONNEL. SEE EXISTING RATING PLATE FOR APPLIANCE MODEL NO. AND INPUT RATING.

NOTE: Gas input rate on rating plate is for installations up to 2000 ft. above sea level. In U.S.A. the input rating for altitudes above 2000 ft. must be derated by 4% for each 1000 ft. above sea level. In Canada the input rating must be derated by 10% for altitudes of 2000 ft. to 4500 ft. above sea level. For installation altitudes above 2000 ft., contact your distributor for proper orifice size.

KIT NO. CPNGCONV004C00 (0 ~ 2000 ft. above sea level)

FUEL USED: NATURAL GAS INLET PRESSURE (min - max): 4.0 - 13.0 in. wc

APPLIANCE MODELS	NAMEPLATE INPUT, HIGH STAGE (Btu/hr)	NUMBER OF BURNERS	FOR INSTALLATION ALTITUDES OF 0 TO 2000 ft. (0 TO 610m) ABOVE SEA LEVEL			
			Orifice No.	Orifice Qty.	Manifold Pressure, High Stage (in. wc)	Manifold Pressure, Low Stage (in. wc)
48DU, 48DT, 48VG [‡] , 48VR [‡] , 48XL, 48XT, 577B, 577D, 577E [‡] , 677B, 677D, 677E [‡]	40000	2	44	2	3.2~3.8	1.4~2.0
	60000	3	44	3	3.2~3.8	1.4~2.0
	90000	3	38	3	3.2~3.8	1.4~2.0
	115000	3	33	3	3.2~3.8	1.4~2.0
	127000	3	31	3	3.2~3.8	1.4~2.0
	130000	3	31	3	3.2~3.8	1.4~2.0
48ES, 48EZ, 48VG [§] , 48VL, 48VT, 574D, 577C, 577E [§] , 674D, 677C, PY3G, PY4G	40000	2	44	2	3.2~3.8	NA
	60000	2	38	2	3.2~3.8	NA
	90000	3	44	3	3.2~3.8	NA
	115000	3	38	3	3.2~3.8	NA
	127000	3	33	3	3.2~3.8	NA
	130000	3	31	3	3.2~3.8	NA

NA = Not Applicable

[‡]208/230 VAC Models Only

[§] 460 VAC Models Only

50CY502883

CPNGCONV

This control has been converted for use with natural gas.
Ce contrôle a été converti pour fonctionner au gaz naturel.

48VG400076

THIS FURNACE WAS CONVERTED ON
— — TO NATURAL GAS

(DAY - MONTH - YEAR)

KIT NO.: CPNGCONV004C00

(0 ~ 2000 ft. above sea level),

BY:

(Name and address of organization making this conversion),
which accepts the responsibility that this conversion has
been properly made.

CE GÉNÉRATEUR D'AIR CHAUD A ÉTÉ
CONVERTI LE — — POUR

(JOUR - MOIS - ANNÉE)

DE L'ENSEMBLE N°: CPNGCONV004C00

(0 ~ 2000 ft. above sea level),

PAR:

(nom et adresse de l'organisme qui a effectué la conversion),
qui accepte l'entière responsabilité de la conversion.

50CY502884



50CY402882 REV. -

Fig. 8 - Conversion Responsibility Label

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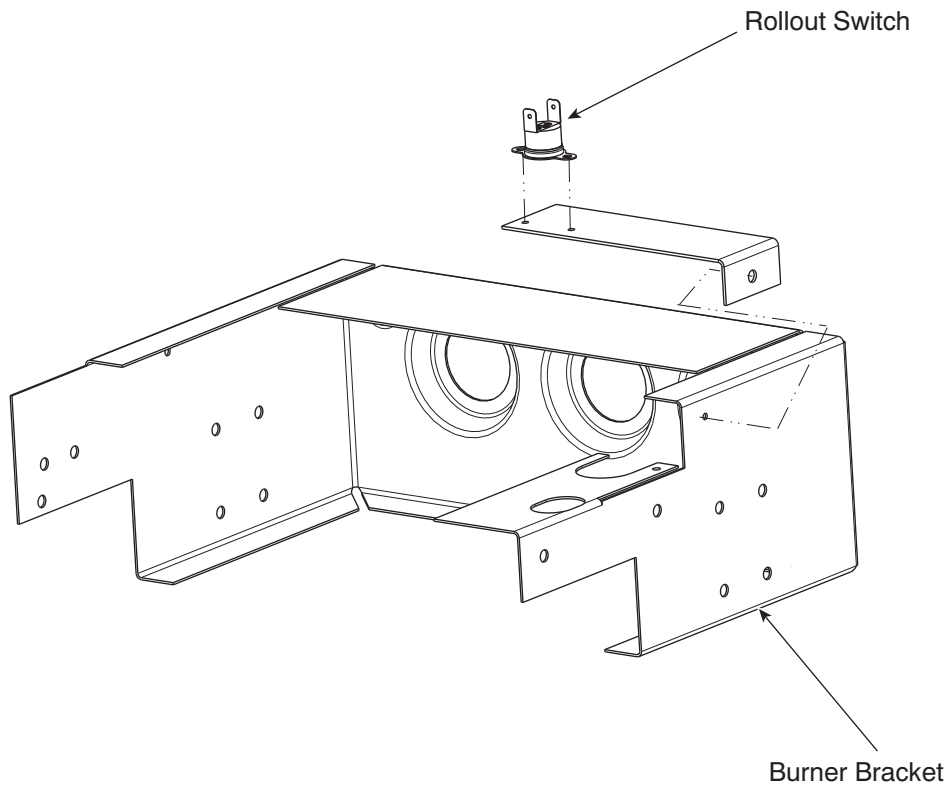


Fig. 9 - Burner Bracket

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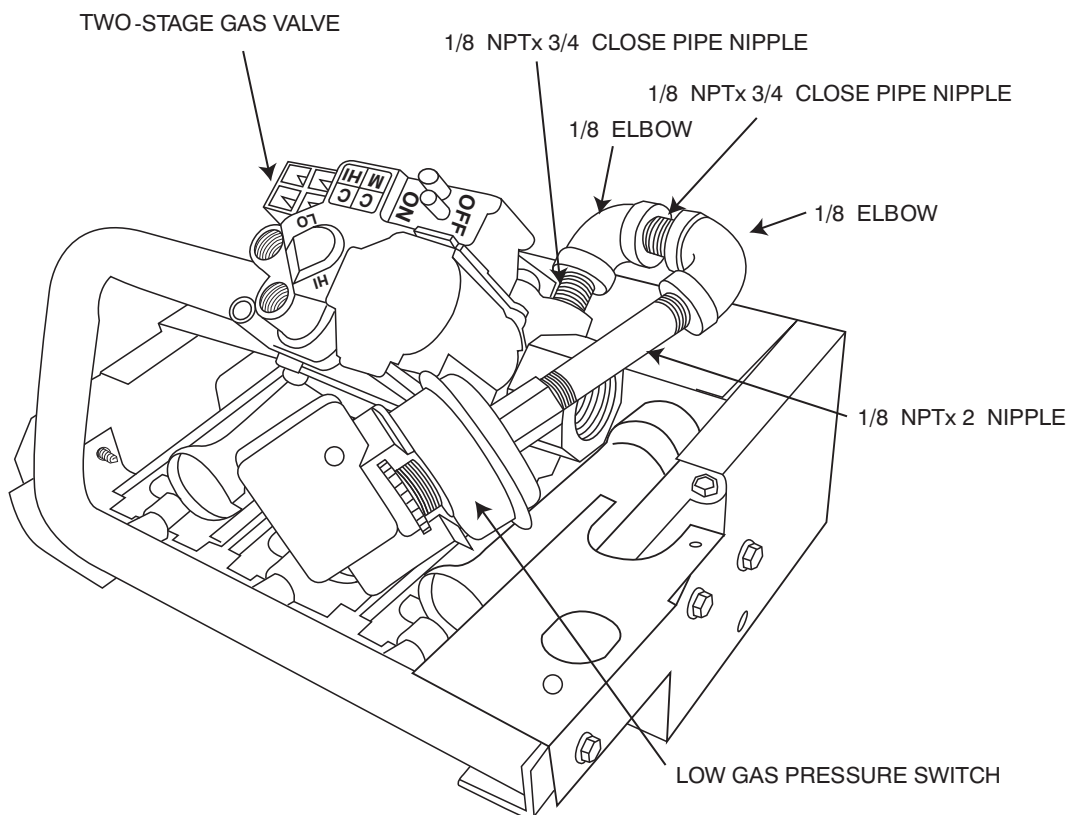
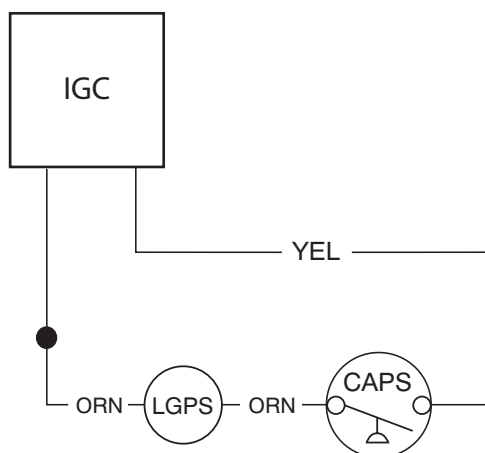


Fig. 10 - Removing Elbows, Nipples, and Low Gas Pressure Switch on Two-Stage Units

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LEGEND
 ORN = ORANGE
 YEL = YELLOW
 LGPS = LOW GAS PRESSURE SWITCH
 CAPS = COMBUSTION AIR PRESSURE SWITCH
 IGC = INTEGRATED GAS CONTROL
 ● = QUICK CONNECTION

Fig. 11 - Removing Low Gas Pressure Switch Wiring

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Table 5 – Single-Stage Kit Contents

ITEM	PART NO.	QUANTITY
Installation Instructions	IIK-CPNGCONV-06	1
Natural Gas Orifice #31*	LH32RF120	3
Natural Gas Orifice #33*	LH32RF113	3
Natural Gas Orifice #38*	LH32RF102	3
Natural Gas Orifice #44*	LH32RF086	3
Regulator Spring (F92-0953)	EF39ZW037	1
Natural Conversion Label (Rating Plate)	50CY502883	1
Natural Conversion Label (Installer Responsibility)	50CY502884	1
Natural Conversion Warning Label (Gas Valve)	48VG400076	1
1/8-in. Pipe Plug	CA64AS001	1

*Refer to Table 4 to determine the correct orifice to use.

SINGLE-STAGE KIT INTRODUCTION

These instructions cover the installation of a natural gas conversion kit on models 48ES, 48EZ, 48VG (460 VAC models), 48VL, 48VT, 574D, 577C, 577E (460 VAC models), 674D, 677C, PY3G and PY4G that are equipped with a White Rodgers single-stage automatic gas valve regulator.

DESCRIPTION AND USAGE

This single-stage kit is applicable to units with heating inputs from 40,000 to 130,000 Btu/hr installed at standard altitudes from 0 ft to 2000 ft. (0-610 m). It cannot be used for high altitude installation. For high altitude conversion please contact your local supplier. All such units were factory equipped to operate on natural gas, but may have been field converted to operate on propane gas. This kit restores the unit to original factory conditions.

SINGLE-STAGE KIT INSTALLATION

⚠ WARNING

FIRE, EXPLOSION, ELECTRICAL HAZARD

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

Gas supply **MUST** be shut off before disconnecting electrical power and proceeding with conversion.

Before installing or servicing system, always turn off main power to system. There may be more than one disconnect switch. Tag disconnect switch with suitable warning label.

1. Turn off gas supply first, then power to unit.
2. Remove the control access panel from unit.
3. Disconnect the gas pipe from the gas valve.
4. Remove the screw attaching the gas manifold to the basepan, and partially slide out the entire burner rack assembly from unit. Save screw. The fan partition mounting

bracket may be removed for easier access to the burner assembly. The bracket may be removed for easier access to the burner assembly. The bracket may be removed by removing 2 screws (located on the left side of the control compartment on the fan partition panel) and sliding the bracket forward, bottom first. See Fig. 5.)

⚠ CAUTION

UNIT "RED TAG" HAZARD

Failure to follow this caution may result in local or state fines or legal consequences.

Failure to install proper baffles in this unit will violate applicable laws regulating NOx emissions in those districts.

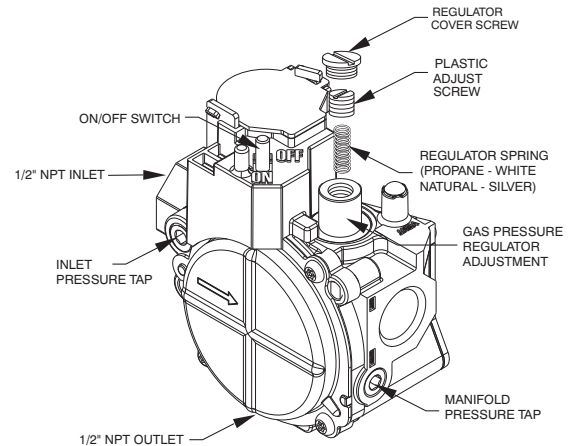
CALIFORNIA INSTALLATIONS ONLY: When this unit is operated with natural gas fuel in certain State of California Air Quality Management Districts, the firing tubes must be equipped with V-shaped NOx baffles to reduce NOx emissions below mandated limits. This unit was originally factory equipped to operate with natural gas fuel and NOx baffles, but the baffles were removed during field conversion to propane gas. These baffles **MUST** be reinstalled as shown in Fig. 1. If the original baffles are no longer available, order replacement baffles from the factory.

5. Disconnect the gray and brown wires from the gas valve and remove blue wires from the rollout switch.

NOTE: To locate rollout switch, see Fig. 9.

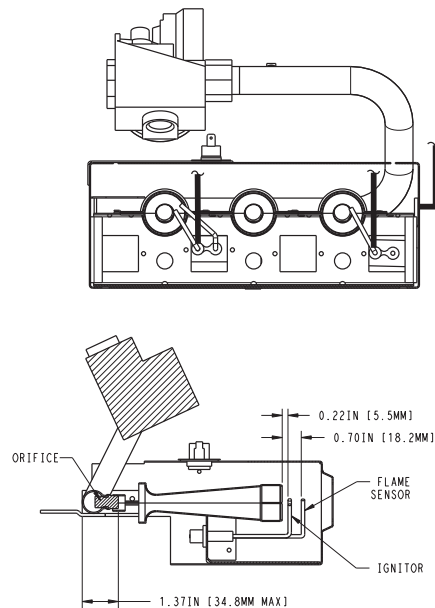
6. Disconnect orange sparkler cable from the sparkler.
7. Disconnect yellow flame sensor wire from the flame sensor.
8. Disconnect low gas pressure switch (see Fig. 11).
9. Remove the ground screw securing the brown wire from the burner assembly. Ground screw is attached to the fan partition. Save screw.
10. Completely slide out the entire burner rack assembly from unit.
11. Using a 5/16 in. nut driver, remove the four screws securing the manifold/gas valve assembly to the burner assembly. Save these screws.
12. For single stage 40,000 Btu/hr and 3 cell 60,000 Btu/hr only (see Fig. 7). Remove the burners from the rack, save the screws. Remove the snap ring from the end of each burner. Remove burner insert in the end of each burner. Replace the snap ring insert (see Fig. 7 for correct orientation). Replace the burners in the rack using the saved screws, making sure closed crossovers of burners are at each end.
13. If there is a low gas pressure switch mounted to the gas valve (see Fig. 17) it must be removed. Disconnect all of the 1/8-in NPT pipe fittings leading back to the gas valve. Plug the open hole in the gas valve with the 1/8-in. pipe plug contained in this kit. Use a suitable pipe sealant (field-supplied, must be certified for use with natural gas) to prevent leakage of combustible gas.
14. Remove the propane gas orifices from the manifold using a 9/16 in. wrench and install the correct natural gas orifices in the manifold (See Table 4 to select correct orifice size based on rated input. See Fig. 13 and 16 for orifice installation).
15. Replace the manifold/gas valve assembly into the burner assembly using the four screws saved from step 11.
16. Remove regulator cover screw from the gas regulator (see Fig. 12). Save regulator cover screw.
17. Using a screwdriver, remove the plastic regulator adjust screw from the gas regulator (see Fig. 12). Save plastic regulator adjust screw.

18. Remove regulator spring (white) from the gas regulator (see Fig. 12). Discard regulator spring.
19. Install natural gas regulator spring (silver) shipped with this kit. (See Fig. 12).
20. Install plastic adjust screw into the gas regulator, turn clockwise 12 turns (see Fig. 12).
21. Verify igniter, flame sensor, orifice/main burner relationship prior to completing conversion. (See Fig. 13.) Partially slide burner rack assembly into unit.
22. Reconnect the orange wire removed in step 8 to the combustion air pressure switch.
23. Reconnect the blue wires removed in step 5 to the rollout switch and reinstall the rollout switch.
24. Reconnect orange sparkler cable to sparkler and reconnect the yellow flame sensor wire to the flame sensor.
25. Reconnect the gray and brown wires removed in step 5 to the gas valve.



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Fig. 12 - Single-Stage Gas Valve



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Fig. 13 - Single-Stage Igniter, Flame Sensor, Orifice/Main Burner Relationship

26. Slide burner rack assembly into base pan. Align burner rack with screws on sheet metal partition and slide assembly back tight to the partition. Replace the screw attaching the burner rack to the base pan removed in step 4. If the fan

partition mounting bracket was removed, slide bracket back into place and fasten with 2 screws (see Fig. 5).

27. Reconnect the brown wire from the burner assembly to the fan partition panel, using the ground screw saved from step 9.
28. Remove the 1/8 in. pipe plug on the gas manifold and connect a pressure manometer (see Fig. 14).
29. Reconnect electrical power and gas supply to the unit. For propane applications, the gas pressure must not be less than 7.0 IN. W.C. or greater than 10.5 IN. W.C. at the unit connection. A 1/8-in. NPT plugged tapping, accessible for test gauge connection, must be installed immediately upstream of the gas supply connection to the gas valve and downstream of the manual equipment shutoff valve.



WARNING

FIRE AND EXPLOSION HAZARD

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

Never test for gas leaks with an open flame. Use a commercially available soap solution made specifically for the detection of leaks to check all connections. A fire or explosion may result causing property damage, personal injury or loss of life.

IMPORTANT: Restart unit and leak check all gas connections including the main service connection, gas valve, gas spuds, and manifold pipe plug. All leaks must be repaired before firing unit.

30. Fire unit and verify proper ignition and proper sequence of operation (Table 6). See Table 4 for proper manifold pressure setting for your unit. Adjust the gas valve setting by turning the plastic adjustment screw clockwise to increase pressure and counter-clockwise to decrease pressure. Refer to Table 7 for required rated heating input rates. Replace regulator cover screw when finished (see Fig. 12).

Verify natural gas input rate.

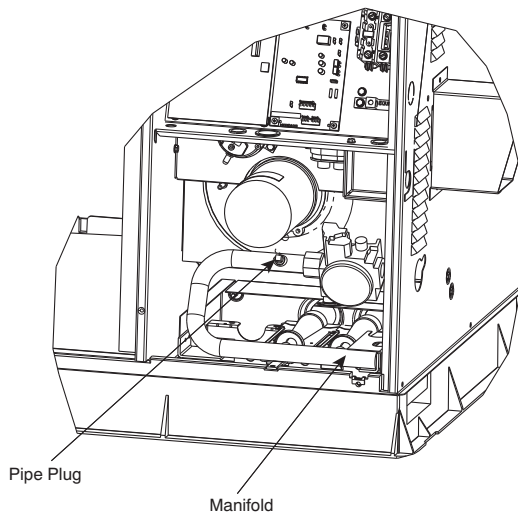
- a. Turn off all other gas appliances and pilots served by the gas meter.
- b. If unit is not running, set desired temperature several degrees above room temperature in gas heat mode using the thermostat.
- c. Record number of seconds for gas meter to complete 1 revolution.
- d. Divide number of seconds in step c, into 3600 (number of seconds in 1 hour).
- e. Multiply result of step d. by the number of cubic feet shown for one revolution of test dial to obtain cubic feet of gas flow per hour.
- f. Multiply result of step f. by Btu heating value of the gas to obtain total measured input shown in Table 4.
(Consult the local gas supplier if the heating value of gas is not known).

EXAMPLE: Assume a 90,000 input unit is being installed. Assume that the size of the dial is 2 cubic ft., one revolution takes 84 seconds, and the heating value of the gas is 1025 Btu/ft³. Proceed as follows:

- a. 84 seconds to complete one revolution
- b. $3600/84 = 42.9$
- c. $42.9 \times 2 = 85.8 \text{ ft}^3 \text{ of gas flow/hr.}$
- d. $85.8 \times 1050 = 90,090 \text{ Btuh input.}$

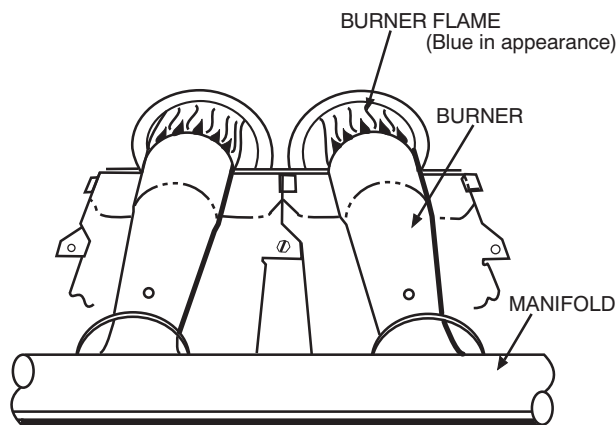
In this example, the nominal input rate is 90,000 Btu/hr, so the manifold pressure is correctly set. If the measured rate is too low, increase the manifold pressure to increase rate. If the measured rate is too high, decrease the manifold pressure to decrease rate.

31. With control access panel removed, observe unit heating operation. Watch burner flames to verify that they are blue in appearance, and that the flames are approximately the same for each burner (see Fig. 15).
32. Turn off unit, remove pressure manometer and replace the 1/8 in. pipe fitting on the gas manifold (see Fig. 14).
33. Attach warning label (P/N 48VG400076) to visible side of gas valve.
34. Attach conversion label (P/N 50CY502883) above unit rating plate on exterior of unit.
35. Attach completed conversion responsibility label (see Fig. 8, P/N 50CY502884) inside control access panel.
36. After all leaks are eliminated, replace control access panel.



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Fig. 14 - Single-Stage Burner Assembly



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Fig. 15 - Monoport Burner

Table 6 – Single-Stage Sequence of Operations

For Units With a Separate Blower Fan Control Board

Trial-for-Ignition Sequence: The ignition sequence is to immediately energize the inducer motor on a call for heat. Within approximately 5 sec of the call for heat, the gas valve will open and the igniter will spark. Seven sec will be allowed to prove flame sense on the far burner.

Flame-Proving: Once flame is proven, the control will wait an additional 45 sec to energize the indoor blower motor. On removal of the call for heat, the gas valve will immediately shut down, the inducer motor will run for an additional 5 sec, and the indoor blower will run for an additional 45 sec (minimum).

For Units With an Integrated Ignition/Blower Fan Control

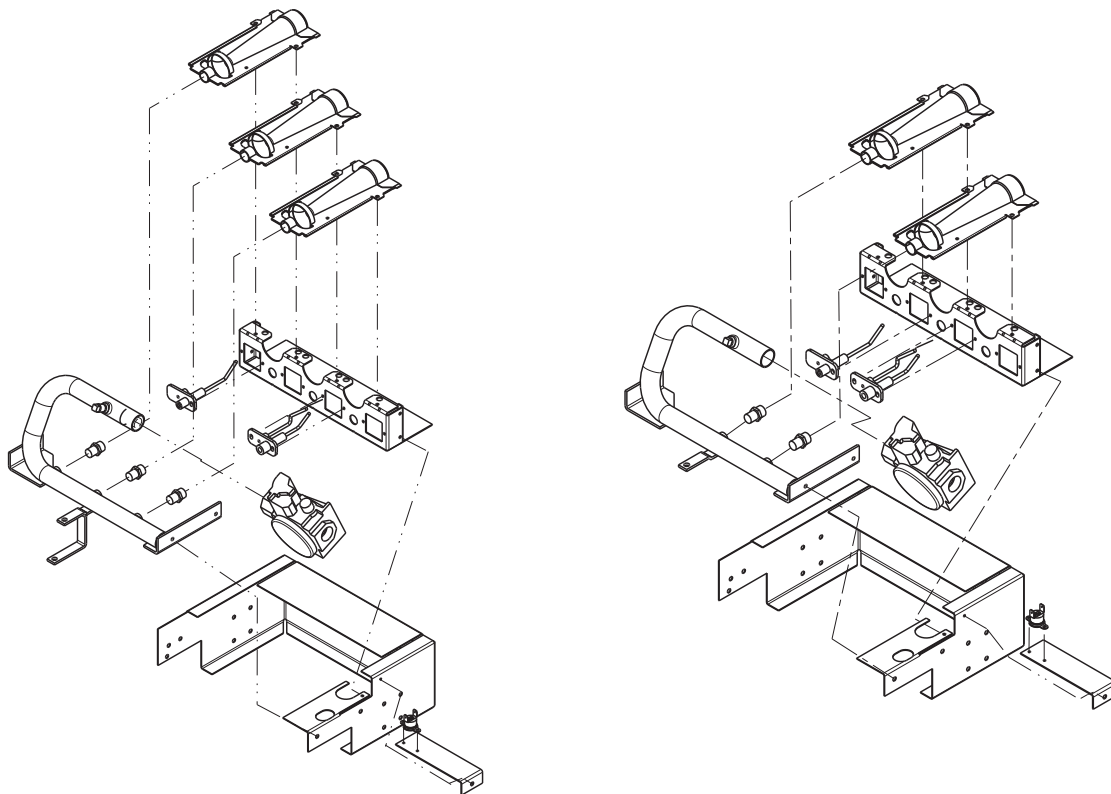
Trial-for-Ignition Sequence: The ignition sequence is to turn on the inducer motor for 5 second pre-purge after a call for heat is established. The gas valve will then open and the igniter will spark. Seven seconds will be allowed to prove flame to sense on the far burner.

Flame-Proving: Once flame is proven, the control will wait an additional 30 sec to energize the indoor blower motor. On removal of the call for heat, the gas valve will immediately shut down, the inducer motor will run for an additional 5 sec, and the indoor blower will run for an additional 90 sec (minimum).

Table 7 – Single-Stage Rated Heating Input, Natural Gas (0-2000 ft [0-610 m] Altitude)

NAMEPLATE INPUT (BTU/HR)	RATED HEATING INPUT NATURAL (BTU/HR)
40,000	40,000
60,000	60,000
90,000	90,000
115,000	115,000
127,000	127,000
130,000	130,000

CPNGCONV



Single-Stage 60,000 BTUH to
130,000 BTUH Units
(60,000 BTUH 3-Cell Models)

Single-Stage 40,000 BTUH to
60,000 BTUH Units
(60,000 BTUH 2-Cell Models)

Fig. 16 - Single-Stage Orifice Installation

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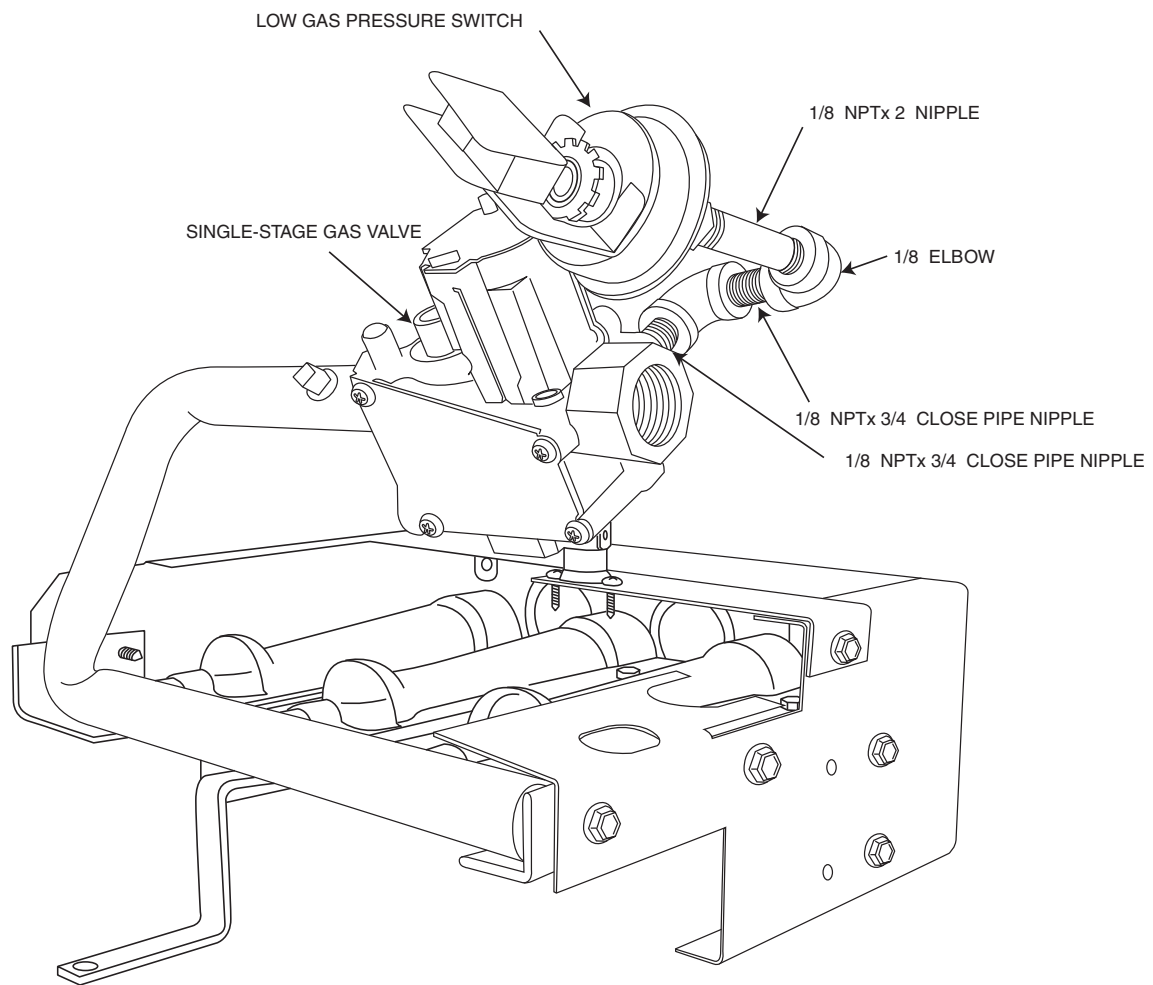


Fig. 17 - Removing Elbows, Nipples, and Low Gas Pressure Switch on Single-Stage Units

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