

GAS CONVERSION KIT INSTALLATION FOR GAS-FIRED UPFLOW HEATER

MODEL CAUA

GENERAL INFORMATION

These gas conversion kits are for model CAUA heaters equipped with specific single-stage or two-stage gas valves. The kits are for operation at sea level. When converting a unit with a two-stage valve (option AG2), check for the valve manufacturer. If the unit has a two-stage White-Rodgers valve, a new two-stage gas valve is required.

Gas Valve Identification

In order to verify which conversion kit is compatible with your heater, it is necessary to know the type of gas valve on the heater. Refer to the unit rating plate for the complete model number of the heater. Also, refer to the manufacturer's name and number found on the gas valve. Match the model number of the valve to the one listed in the kit—if different, contact your manufacturer representative to select and verify parts required for gas conversion.

Important Safety Information

- Refer to the installation manual provided with the heater for important safety information.
- Pay attention to all dangers, warnings, cautions, and notes highlighted in this manual. Safety markings should not be ignored and are used frequently throughout to designate a degree or level of seriousness.

⚠ DANGER ⚠

- **All gas conversion must be done by a qualified service person in accordance with these instructions and in compliance with all codes and requirements. In Canada, gas conversion shall be carried out in accordance with the requirements of the Provincial Authorities having jurisdiction and in accordance with the requirements of the CAN/CGA-B149.1 and CAN/CGA-B149.2 installation code.**
- **The conversion kit is to be selected and installed by a qualified service person in accordance with these instructions and in compliance with all codes and requirements of authorities having jurisdiction. Failure to follow instructions could result in death, serious injury, and/or property damage. The qualified agency performing this work assumes responsibility for this conversion.**
- **Improper installation, adjustment, alteration, service, or maintenance can cause property damage, injury, or death. Read the installation, operation, and maintenance instructions thoroughly before installing or servicing this equipment.**
- **FOR YOUR SAFETY: Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.**
- **The gas burner in this gas-fired equipment is designed and equipped to provide safe, complete combustion. However, if the installation does not permit the burner to receive the proper supply of combustion air, complete combustion may not occur. The result is incomplete combustion, which produces carbon monoxide, a poisonous gas that can cause death.**
- **Safe operation of indirect-fired gas burning equipment requires a properly-operating vent system that vents all flue products to the outside atmosphere. FAILURE TO PROVIDE PROPER VENTING WILL RESULT IN A HEALTH HAZARD THAT COULD CAUSE SERIOUS PERSONAL INJURY OR DEATH.**
- **If installed as a separated-combustion system, install either the horizontal or vertical combustion air/vent system illustrated in the heater installation manual, using the concentric adapter supplied. All installations must comply with the combustion air requirements in the installation codes and instructions. Units installed in a confined space must be supplied with air for combustion and ventilation as required by code and in the heater installation manual. Combustion air at the burner should be regulated only by manufacturer-provided equipment. NEVER RESTRICT OR OTHERWISE ALTER THE SUPPLY OF COMBUSTION AIR TO ANY HEATER. MAINTAIN THE VENT SYSTEM IN PROPERLY-OPERATING CONDITION.**

CONVERSION KIT SELECTION

NOTES:

- Refer to [Table 1](#) for a list of natural gas (NG) to propane (LP) conversion kit components.
- Refer to [Table 2](#) for a list of propane to natural gas conversion kit components.
- Refer to [Table 3](#) for burner orifices included in the gas conversion kits (for sea-level operation only) and for replacement orifices for high-elevation (>2,000 feet) installations.
- Refer to [Table 4](#) for a list of additional components required for converting a unit equipped with a two-stage White-Rodgers (WR) gas valve. When converting a unit with a two-stage valve (option AG2), check for the valve manufacturer. If equipped with a Honeywell (HW) valve, select the kit listed in [Table 1](#) and [Table 2](#).
- All kits include the quantity of orifices required for the largest size of heater. Extra burner orifices may not be returned for credit.

Table 1. Natural Gas to Propane Conversion Kit Components

Unit Size	Kit PN	Component*	Description	PN	Gas Valve (Model No.)
All		NG to LP spring kit	HW #393691 for single-stage valve VR8105, VR8205, or VR8305	98720	—
		Tape	Conversion	64391	
		Disk	Propane	37752	
150	269833	NG to LP spring kit	HW #396221 for single-stage valve VR8215	260605	Single-stage (HW #VR8304M2816, #VR8205M1130, or #VR8215S1263) or two-stage (HW #VR8204Q2418)
		Spring regulator kit	HW #396021 for two-stage valve	197207	
200	269834	NG to LP spring kit	HW #396221 for single-stage valve VR8215	260605	Single-stage (WR #36C68-452, #36H32-441, or HW #VR8305M4009) or two-stage (HW #VR8304Q4404)
		Spring regulator kit	HW #396021 for two-stage valve	197207	
250	170815	Spring regulator kit	WR #F920659 for single-stage WR valve	82524	Single-stage (WR #36C68-452, #36H32-441, or HW #VR8305M4009) or two-stage (HW #VR8304Q4404)
			HW #396021 for two-stage valve	197207	
275, 300	170816	Spring regulator kit	WR #F920659 for single-stage WR valve	82524	
			HW #396021 for two-stage valve	197207	
350	170817	Spring regulator kit	WR #F920659 for single-stage WR valve	82524	
			HW #396021 for two-stage valve	197207	
400	170818	Spring regulator kit	WR #F920659 for single-stage WR valve	82524	
			HW #396021 for two-stage valve	197207	

*Burner orifices are include in each kit. Refer to [Table 3](#) for orifice PN, size, and quantity.

Table 2. Propane to Natural Gas Conversion Kit Components

Unit Size	Kit PN	Component*	Description	PN	Gas Valve (Model No.)
All		LP to NG spring kit	HW #394588 for single-stage valve VR8105, VR8205, or VR8305	98721	—
		Tape	Conversion	64391	
		Disk	Natural Gas	1401	
150	269833	LP to NG spring kit	HW #396222 for single-stage valve VR8215	261651	Single-stage (HW #VR8204M1018, #VR8205M1148, or #VR8215S5215) or two-stage (HW #VR8304Q4412)
		Spring conversion kit	HW #396025 for two-stage valve	197208	
200	269834	LP to NG spring kit	HW #396222 for single-stage valve VR8215	261651	Single-stage (WR #36C68-325, #36H32-442, or HW #VR8305M4819) or two-stage (HW #VR8304Q4412)
		Spring conversion kit	HW #396025 for two-stage valve	197208	
250, 275, 300	170810	Spring conversion kit	WR #92-0656 for single-stage WR valve	82525	Single-stage (WR #36C68-325, #36H32-442, or HW #VR8305M4819) or two-stage (HW #VR8304Q4412)
			HW #396025 for two-stage valve	197208	
350	170811	Spring conversion kit	WR #92-0656 for single-stage WR valve	82525	
			HW #396025 for two-stage valve	197208	
400	170812	Spring conversion kit	WR #92-0656 for single-stage WR valve	82525	
			HW #396025 for two-stage valve	197208	

*Burner orifices are include in each kit. Refer to [Table 3](#) for orifice PN, size, and quantity.

Table 3. Burner Orifices									
Installation Elevation (Feet (Meters))	Installation Location	Gas Type	Unit Size						
			150	200	250	275	300	350	400
			PN, Orifice Size (Quantity)						
0–2000 (0–610)	US or Canada	Natural	164866, 2.10 mm (8)	11833, #44 (10)	11833, #44 (13)	16590, #46 (15)	11833, #44 (15)	11835, #37 (12)	45870, #38 (14)
		Propane	97359, 1.25 mm (8)	11830, #55 (10)	97359, 1.25 mm (13)	11830, #55 (15)		9789, #53 (12)	61653, 1.55 mm (14)
2001–3000 (611–915)	US	Natural	84853, #47 (8)	38678, #45 (10)	38678, #45 (13)	84853, #47 (15)	38678, #45 (15)	45870, #38 (12)	45871, #39 (14)
		Propane	97359, 1.25 mm (8)	11830, #55 (10)	97359, 1.25 mm (13)	11830, #55 (15)		11834, #54 (12)	9789, #53 (14)
2001–4500 (611–1373)	Canada	Natural	40414, #48 (8)	38678, #45 (10)	38678, #45 (13)	38678, #45 (15)		45871, #39 (12)	11792, #41 (14)
		Propane	63003, 1.20 mm (8)	11830, #55 (10)	63003, 1.20 mm (13)	11830, #55 (15)		11834, #54 (12)	61652, 1.45 mm (14)
3001–4000 (916–1220)	US	Natural	84853, #47 (8)	38678, #45 (10)	38678, #45 (13)	84853, #47 (15)	38678, #45 (15)	45871, #39 (12)	87391, #40 (14)
		Propane	63003, 1.20 mm (8)	11830, #55 (10)	63003, 1.20 mm (13)	11830, #55 (15)		11834, #54 (12)	9789, #53 (14)
4001–5000 (1221–1525)	US	Natural	40414, #48 (8)	38678, #45 (10)	38678, #45 (13)	84853, #47 (15)	38678, #45 (15)	45871, #39 (12)	11792, #41 (14)
		Propane	63003, 1.20 mm (8)	11830, #55 (10)	63003, 1.20 mm (13)	11830, #55 (15)		11834, #54 (12)	61652, 1.45 mm (14)
5001–6000 (1526–1830)	US	Natural	40414, #48 (8)	16590, #46 (10)	16590, #46 (13)	40414, #48 (15)	16590, #46 (15)	87391, #40 (12)	11792, #41 (14)
		Propane	63003, 1.20 mm (8)	39658, #56 (10)	63003, 1.20 mm (13)	39658, #56 (15)		11834, #54 (12)	61652, 1.45 mm (14)
6001–7000 (1831–2135)	US	Natural	40414, #48 (8)	84583, #47 (10)	84583, #47 (13)	39651, #49 (15)	84583, #47 (15)	11792, #41 (12)	84437, #42 (14)
		Propane	39658, #56 (8)	39658, #56 (10)	39658, #56 (13)	39658, #56 (15)		11834, #54 (12)	61652, 1.45 mm (14)
7001–8000 (2136–2440)	US	Natural	39651, #49 (8)	84583, #47 (10)	84583, #47 (13)	39652, #50 (15)	84583, #47 (15)	84437, #42 (12)	84437, #42 (14)
		Propane	63922, 1.15 mm (8)	39658, #56 (10)	63922, 1.15 mm (13)	39658, #56 (15)		11834, #54 (12)	11834, #54 (14)
8001–9000 (2441–2745)	US	Natural	39651, #49 (8)	40414, #48 (10)	40414, #48 (13)	39652, #50 (15)	40414, #48 (15)	84437, #42 (12)	11828, #43 (14)
		Propane	63922, 1.15 mm (8)	39658, #56 (10)	63922, 1.15 mm (13)	39658, #56 (15)		11830, #55 (12)	11834, #54 (14)

CONVERSION KIT SELECTION—CONTINUED

Table 4. Components Required for Converting Unit with Two-Stage White-Rodgers Gas Valve				
Unit Size	Two-Stage Gas Valve		Brass Plug	Reducing Bushing (3/4- to 1/2-Inch)*
	Natural Gas	Propane		
150	177396	177398	107367	37385
200				
250				
275	177397			—
300				
350				
400				

*Used only for natural gas to propane conversions.

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INSTALLATION

Install the conversion kit in accordance with the following steps. Ensure that the kit (refer to [Table 1](#) or [Table 2](#)) is correct for the size of the heater being serviced. Heater component locations are shown in [Figure 1](#).

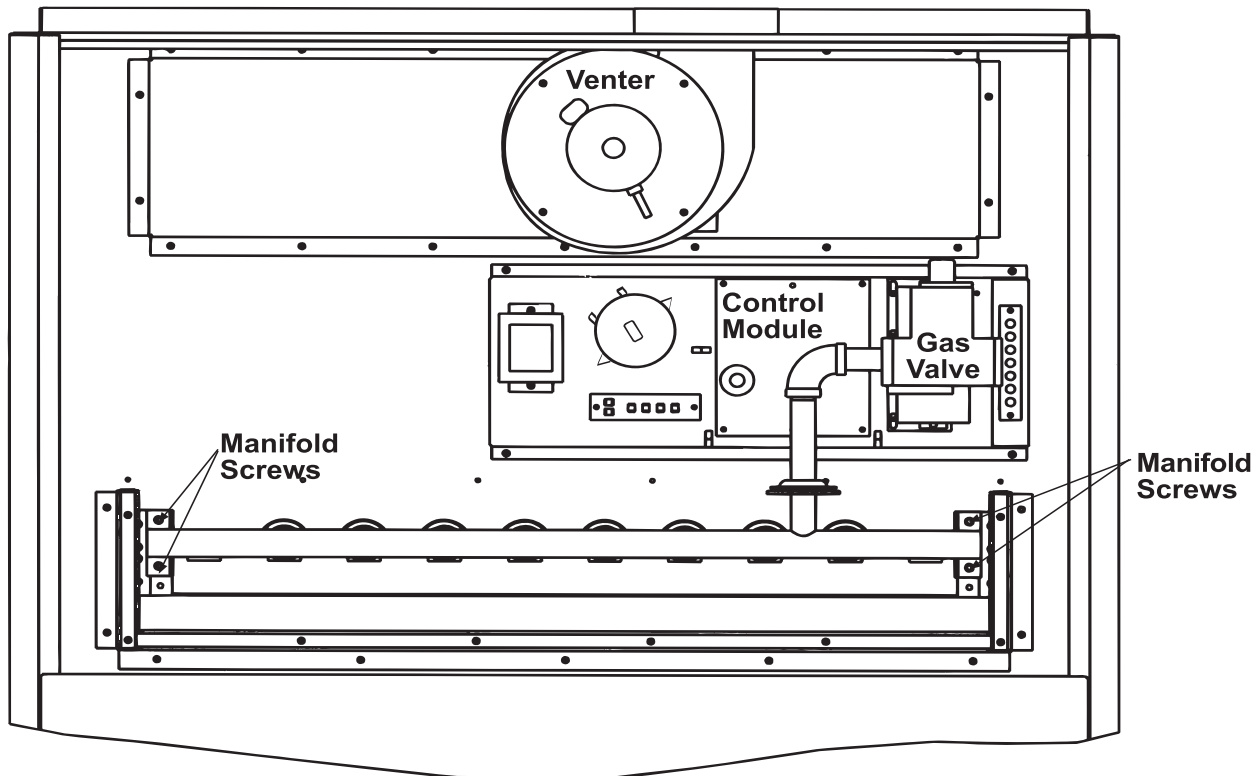


Figure 1. Heater Components

NOTE: Conversion using these kits will not alter the input rate. Refer to the rating plate on the unit for the input rate and other appropriate information.

1. Remove gas supply and electrical power:
 - a. Turn OFF gas supply at shutoff valve upstream of combination gas valve.
 - b. Turn OFF electrical power.
 - c. Open control access panel.

2. Install regulator spring kit:

WARNING

Regulator spring kits are not interchangeable. Each kit must be used only in the model and type of gas valve for which the kit is designated. Verify compatibility before installing the regulator spring kit.

- a. Select regulator spring kit that corresponds with gas valve on heater. All gas conversion kits include one or two regulator spring kits for single-stage valve and one regulator spring for two-stage valve. Other included regulator spring kits will not be used.
- b. Install regulator spring kit in accordance with gas valve manufacturer's instructions (included with regulator spring kit).

NOTE: Depending on when the unit was manufactured, there will be either two or three burner covers. If two, there will be right and left covers that extend over the front of the unit. If three, there will be right and left covers and a separate front cover.

NOTE: When converting a unit with a two-stage White-Rodgers gas valve the spring kits in the conversion kit will not be used and the gas valve requires replacing.

3. For units with White-Rodgers two-stage gas valve, replace valve:

- a. Disconnect gas valve wires from existing valve. Label wires for correct reconnection.
- b. Disconnect existing gas valve from gas supply line and remove valve.

NOTE: Because the unit does not have a pilot, the pilot port on the replacement two-stage White-Rodgers gas valve needs to be plugged using a brass plug.

- c. Using brass plug listed in [Table 4](#), plug port labeled "pilot" on replacement valve listed in [Table 4](#).

WARNING

The operating gas valve is the primary safety shutoff. The gas supply line must be free of dirt or scale before connecting the valve.

- d. Connect inlet side of replacement gas valve to gas supply line. Do not connect valve to manifold.
- e. Connect gas valve wires labelled in step 3b to valve.
- f. Ensure that all gas valve connections are in accordance with unit wiring diagram and valve manufacturer's instructions.

4. Replace burner orifices:

- a. Remove all burner covers and disconnect manifold from valve.
- b. Remove screws that secure manifold assembly and remove manifold assembly from heater.
- c. Carefully remove existing burner orifices.
- d. For all conversions, select replacement burner orifices in accordance with [Table 3](#).

WARNING

Do not attempt to drill burner orifice. Use factory-supplied orifice only.

- e. Install replacement burner orifices.

CAUTION

Ensure that the manifold is positioned properly with relation to the burner rack.

- f. Install manifold assembly in heater and secure using screws removed in step 4b.
- g. Attach conversion disk to heater near gas valve.

INSTALLATION—CONTINUED

- h. Connect manifold to valve. For natural gas to propane conversion of unit size 150 or 200 with White-Rodgers two-stage gas valve, use reducing bushing listed in [Table 4](#) to connect valve.
- i. Install burner cover removed in step 4a.

5. Perform leak test:

- a. Turn ON gas supply at shutoff valve upstream of combination gas valve.
- b. Check between shutoff valve and combination gas valve for gas leaks using commercial leak-detecting fluid or rich soap and water solution. Leaks are indicated by presence of bubbles.
- c. If leak is detected, tighten connection. If leak cannot be stopped by tightening connection, replace part(s).
- d. When no leaks are detected, turn OFF gas supply at shutoff valve upstream of combination gas valve.

6. Restore electrical power and gas supply:

- a. Turn ON electrical power.
- b. Turn ON gas supply and relight heater in accordance with instructions on heater.
- c. Recheck all manifold connections for gas leaks in accordance with step 5.

7. Measure and adjust manifold (outlet) pressure:

⚠ WARNING ⚠

Manifold gas pressure must never exceed 3.5 IN WC for natural gas or 10 IN WC for propane. Incorrect inlet pressure could cause excessive manifold gas pressure.

- a. Ensure that inlet (supply) pressure is in accordance with [Table 5](#) and determine correct manifold (outlet) pressure (refer to [Table 5](#)).

Table 5. Gas Pressure Requirements

Natural Gas		Propane	
Minimum	Maximum	Minimum	Maximum
Inlet (Supply) Pressure (IN WC)			
5.0*	14.0	11.0*	14.0
Single-Stage and Two-Stage High-Fire		Two-Stage Low-Fire	
Natural Gas	Propane	Natural Gas	Propane
Manifold (Outlet) Pressure (IN WC)			
3.5	10.0	1.8	5.0

*Or as stated on the unit rating plate.

- b. Turn knob or switch on top of valve to OFF to prevent flow to gas valve.

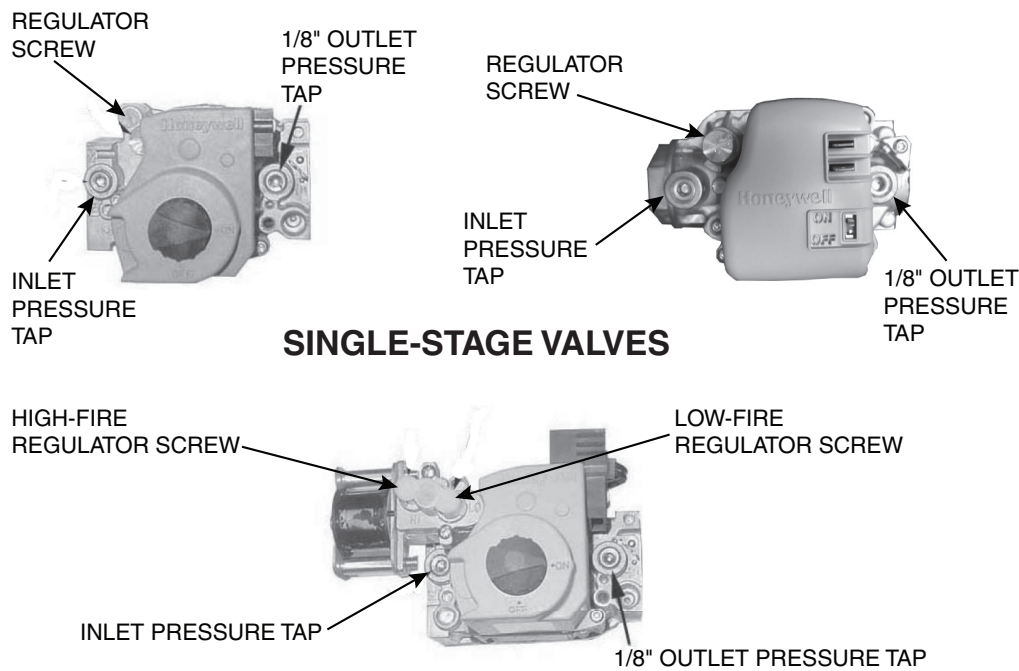
NOTE: A manometer (fluid-filled gauge) is recommended rather than a spring-type gauge due to the difficulty of maintaining the calibration of a spring-type gauge. Use a water column manometer that is readable to the nearest tenth of an inch.

- c. Connect manometer to 1/8-inch output pressure tap on valve (see [Figure 2](#)).

⚠ CAUTION ⚠

DO NOT bottom out the gas valve regulator screw. This can result in excessive overfire and heat exchanger failure due to unregulated manifold pressure.

- d. To measure/adjust high fire pressure on single-stage or two-stage valve:
 - (1) Turn knob or switch on top of valve to ON.
 - (2) If pressure is out-of-range, remove cap from regulator screw (see [Figure 2](#)) and adjust pressure in accordance with [Table 5](#) by turning regulator screw IN (clockwise) to increase pressure or OUT (counterclockwise) to decrease pressure.



TWO-STAGE VALVE

Figure 2. Gas Valves

- e. To measure/adjust low fire pressure on two-stage valve:
 - (1) Disconnect wire from HI terminal on gas valve.
 - (2) Remove cap from low-fire regulator screw (see [Figure 2](#)) and adjust pressure in accordance with [Table 5](#) by turning regulator screw IN (clockwise) to increase pressure or OUT (counterclockwise) to decrease pressure.
 - (3) Reconnect wire to Hi terminal on gas valve.

⚠ WARNING ⚠

In the event of improper ignition, wait at least 5 minutes before attempting to relight the heater.

- f. Turn up thermostat and cycle burner once or twice to properly seat adjustment spring in valve.
- g. Recheck outlet pressure. When pressure corresponds to [Table 5](#), disconnect manometer and install cap on regulator screw.
- h. Check for leakage at 1/8-inch outlet pressure tap fitting. Correct as necessary.
- 8. Operate heater for at least one complete cycle to check for proper operation. Observe main burners for complete flame carryover.**
- 9. Fill out conversion tape and adhere to clean, dry surface near unit rating plate.**
- 10. Close control access panel.**

