

GAS CONVERSION KIT INSTALLATION FOR GAS-FIRED LOW-INTENSITY TUBULAR RADIANT HEATERS

DISCONTINUED MODELS VCS, VCT, VPS, AND VPT

GENERAL INFORMATION

These gas conversion kits are for natural gas units installed at elevations of 0–10,000 feet (0–3,045 meters). If the unit is already manufactured for propane, the only upgrade for elevation is fan orifice plate replacement. There is no conversion kit available for unit size 200. When converting fuels, it is necessary to have the complete heater model. The identifying model number can be found on the heater rating plate. The rating plate identifies only original equipment, so also compare the label on the gas valve with the description listed.

NOTE: DO NOT convert these to propane at installation elevations >5,000 feet (>1,524 meters):

- unit size 150 of all models with S40 tube configuration
- unit size 170 of models VCS and VPS with S40 tube configuration.

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 qualified agency performing this work assumes responsibility for this conversion.
- The gas burner in this gas-fired equipment is designed 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.
- 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 or vent/combustion air system in structurally sound and proper operating condition.
- 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.

DO NOT DESTROY. PLEASE READ CAREFULLY. KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.

KIT SELECTION

Table 1. Natural Gas to Propane Conversion Kit (Option DL2) Components									
Component	Description	Unit Size						Model	
		060	080	100	125	150	170		
		Kit PN							
		1001412	1001413	1001414	1001415	1001416	1001417*		1001418**
Component PN (Quantity)***									
Grommet	12.5 × 9.5 mm	270412						All	
Washer	Retaining, M6	270459							
Flame plate	Propane	269957	269958		269959		269960		
Conversion kit	Gas valve	270374							
Burner orifice plate	Propane	269948	269949	269980	269951	269952			269953
Fan orifice plate	Propane	269924	269925	269929	269931	269933			269937
		269925	269928	269932	269932	269934			
		269928	269929	269933	269933	1011096			
		269929	269930	269934	269934				
			1011095		1011096				
Gasket	Burner assembly	270366 (2)							
Baffle plate	For vision burners	270328			—				
Baffle plate screw	#8 × 1/2, SST	270414 (2)							
Self-tapping screw	#6 × 3/8, BZP	270450 (4)					—	VPS	
Plate	Fan flange	269911							
Gasket	Fan flange plate	270365							
Label	Conversion	270653 (2)	270655 (2)	270657 (2)	270659 (2)	270661 (2)	270661 (2)	270663 (2)	VCS, VPS
		270654 (2)	270656 (2)	270658 (2)	270660 (2)	270662 (2)	—	270664 (2)	VCT, VPT
Jet carrier	Propane	—					270375		All
Gas orifice		Refer to Table 2							
*For use with size 170 model VPS and VCS generation ZZ units—converts burner to size 150 generation BB.									
**For use with size 170 model VCT and VPT generation ZZ units and all generation BB units at installation elevations of 0–2,000 feet.									
***Quantitv is one (1) unless otherwise indicated.									

*For use with size 170 model VPS and VCS generation ZZ units—converts burner to size 150 generation BB.

**For use with size 170 model VCT and VPT generation ZZ units and all generation BB units at installation elevations of 0–2,000 feet.

***Quantity is one (1) unless otherwise indicated.

Table 2. Propane Gas Orifices				
Unit Size				
060	080, 100	125	150	170
PN (Orifice Size)				
270398 (1.1 mm)	270399 (1.3 mm)	270400 (1.5 mm)	270401 (1.7 mm)	270401 (1.7 mm)*
				270403 (1.9 mm)**

*For use with size 170 model VPS and VCS generation ZZ units—converts burner to size 150 generation BB.

**For use with size 170 model VCT and VPT generation ZZ units and all generation BB units at installation elevations of 0–2,000 feet.

INSTALLATION

- Remove gas and electric supply:
 - Shut OFF gas supply ahead of union at manual shutoff valve outside cabinet.
 - Disconnect electrical power/control connections.
 - Disconnect gas supply at union outside of cabinet using two wrenches.
- For models VCS, VCT, and VPT with ducted combustion air, loosen hose clamp that secures flexible hose to fresh air inlet on side of burner cabinet and remove hose.
- Loosen setscrew on burner support casting and remove burner from emitter tube.
- Replace burner orifice plate:
 - Remove and save four screws that secure burner assembly (see [Figure 1](#), DETAIL A) and remove burner support casting and gasket (see [Figure 1](#), DETAIL B). Discard gasket.



Figure 1. Burner Assembly Removal

- b. Disconnect ignition, flame probe, and ground leads and pressure switch silicone tube (see [Figure 2](#)).



Figure 2. Burner Assembly Connections

- c. See [Figure 3](#), DETAIL A. Remove and save three screws that secure existing burner orifice plate to burner tube and remove plate and gasket. Discard gasket.
- d. Remove retaining washer that secures impulse stud to burner orifice plate and remove stud.
- e. See [Figure 3](#), DETAIL B. Orient replacement burner orifice plate with impulse stud and replacement retaining washer facing in correct direction and replacement cable grommet fitted to oblong hole in bottom of plate.
- f. Secure replacement burner orifice plate to burner tube using existing three screws.

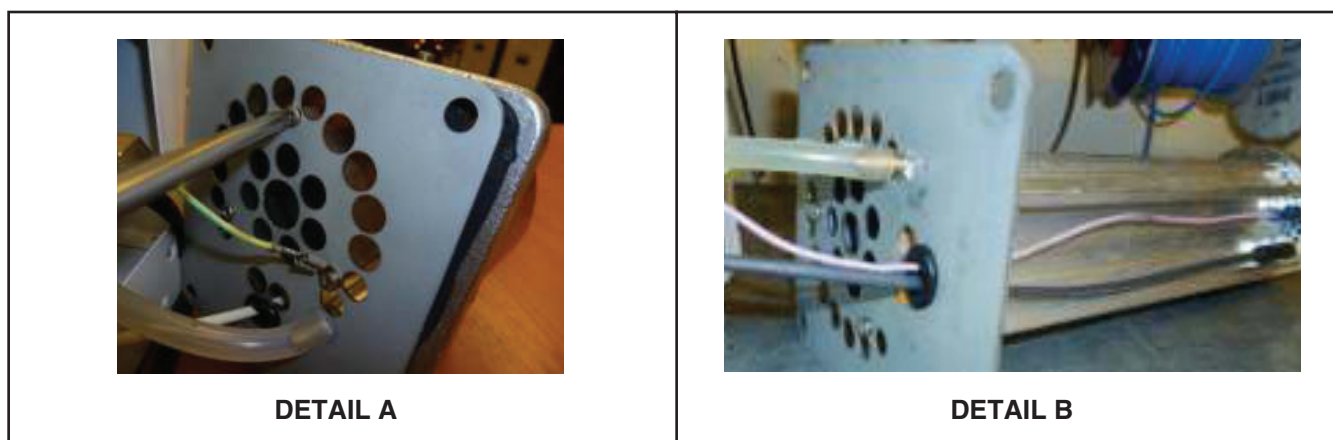


Figure 3. Burner Orifice Plate

INSTALLATION—CONTINUED

5. Replace flame plate:
 - a. Remove and save three screws (see [Figure 4](#), DETAIL A) that secure flame plate and burner head to burner tube.
 - b. Remove flame plate. **DO NOT** remove burner head.
 - c. Remove and discard anti-tip bracket shown in [Figure 4](#), DETAIL B.

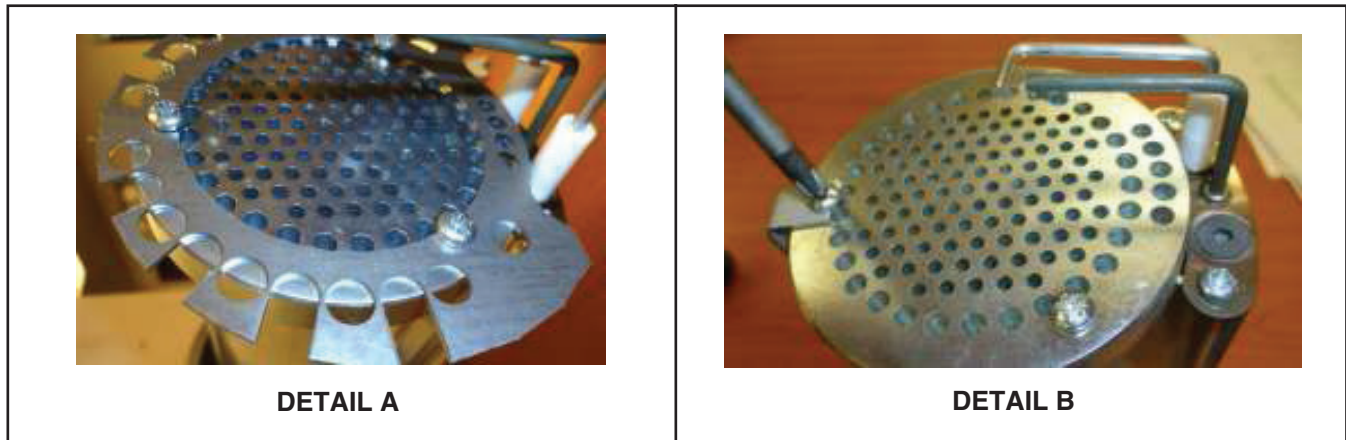


Figure 4. Flame Plate, Burner Head, and Anti-Tip Bracket

- d. Secure flame plate on top of burner head to burner tube using existing three screws. Ensure that five holes on outer ring are aligned properly as shown in [Figure 5](#).

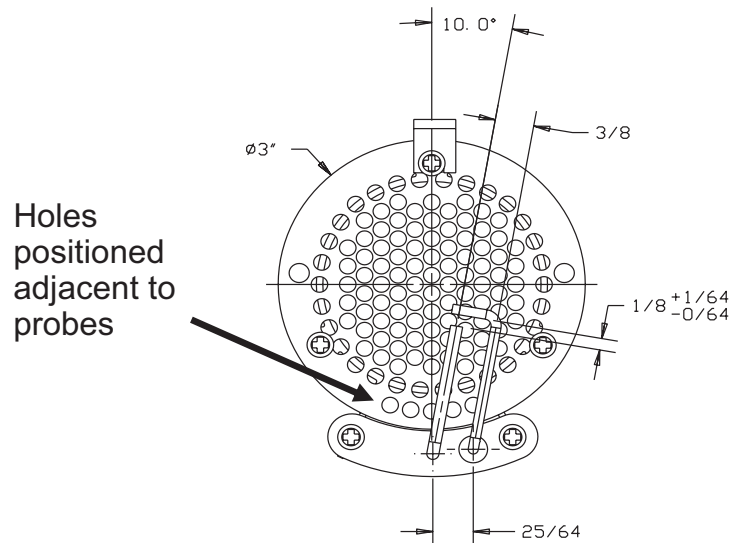


Figure 5. Flame Plate Alignment

6. Relace gas orifice:

⚠ DANGER ⚠

- All components of a gas supply system must be leak tested prior to placing equipment in service. **NEVER TEST FOR LEAKS WITH AN OPEN FLAME.** Failure to comply could result in personal injury, property damage, or death.
- Pipe joint compounds (pipe dope) shall be resistant to the action of any chemical constituents of the gas being supplied.

- a. For unit sizes 060–150 (see [Figure 6](#)):
- (1) Using wrench, unthread existing gas orifice from jet carrier.
 - (2) Using approved pipe joint compound and wrench, thread replacement gas orifice into jet carrier. **DO NOT** overtighten.

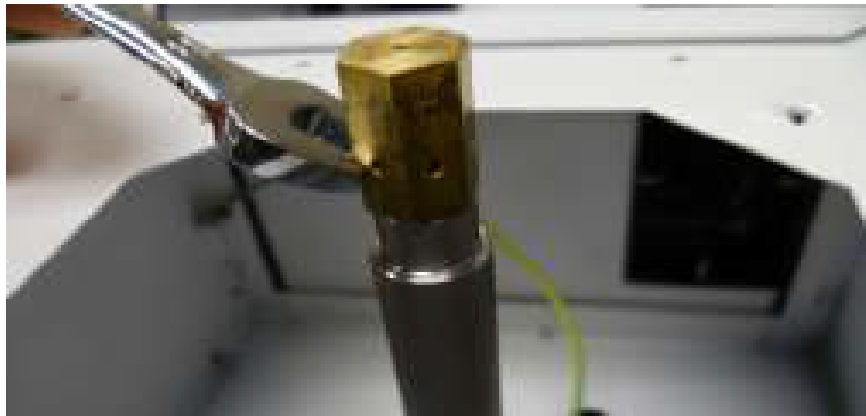


Figure 6. Gas Orifice Replacement for Unit Sizes 060–150

- b. For unit size 170 model VPS (see [Figure 7](#)):
- (1) Remove and save two screws from base of jet carrier. Note ground terminal connection.
 - (2) Remove and save four screws that secure rear burner plate to burner housing and remove plate.
 - (3) Using wrench, unthread existing jet carrier/gas orifice from gas valve.
 - (4) Thread replacement gas orifice into replacement jet carrier.
 - (5) Using approved pipe joint compound and wrench, thread replacement jet carrier/gas orifice into gas valve. **DO NOT** overtighten.
 - (6) Re-install rear burner plate to burner housing and secure plate using existing four screws.
 - (7) Re-install existing two screws in base of jet carrier. Note ground terminal connection.

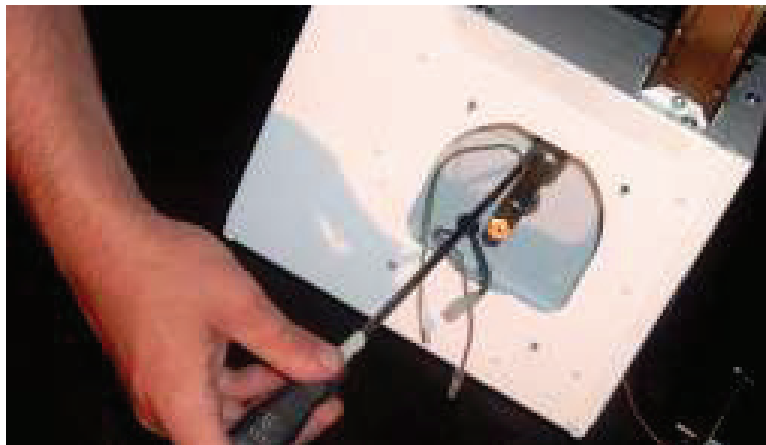


Figure 7. Gas Orifice Replacement for Unit Size 170 Model VPS

INSTALLATION—CONTINUED

- c. For unit size 170 models VCS, VCT, and VPT (see [Figure 8](#)):
- (1) Remove and save two screws from base of jet carrier. Note ground terminal connection.
 - (2) Remove and save four screws that secure base plate and remove plate.
 - (3) Mark and disconnect gas valve wiring connections.
 - (4) Remove four screws that secure gas valve inlet plate to burner housing and remove plate.
 - (5) Remove gas valve rearwards and, using wrench, unthread existing jet carrier/gas orifice from gas valve.
 - (6) Thread replacement gas orifice into replacement jet carrier.
 - (7) Using approved pipe joint compound and wrench, thread replacement jet carrier/gas orifice into gas valve.
DO NOT overtighten.
 - (8) Re-install gas valve inlet plate to burner housing and secure plate using existing four screws.
 - (9) Re-install existing two screws in base of jet carrier. Note ground terminal connection.



Figure 8. Gas Orifice Replacement for Unit Size 170 Models VCS, VCT, and VPT

7. For unit sizes 060, 080, and 100, install baffle plate:

NOTE: For model VCS and VCT units, two existing screws in the baffle plate mounting holes need to be removed.

- a. Carefully position baffle plate inside combustion chamber as shown in [Figure 9](#), DETAIL A.
- b. Align baffle plate holes with existing holes in burner cabinet and secure plate using two baffle plate screws as shown in [Figure 9](#), DETAIL B.

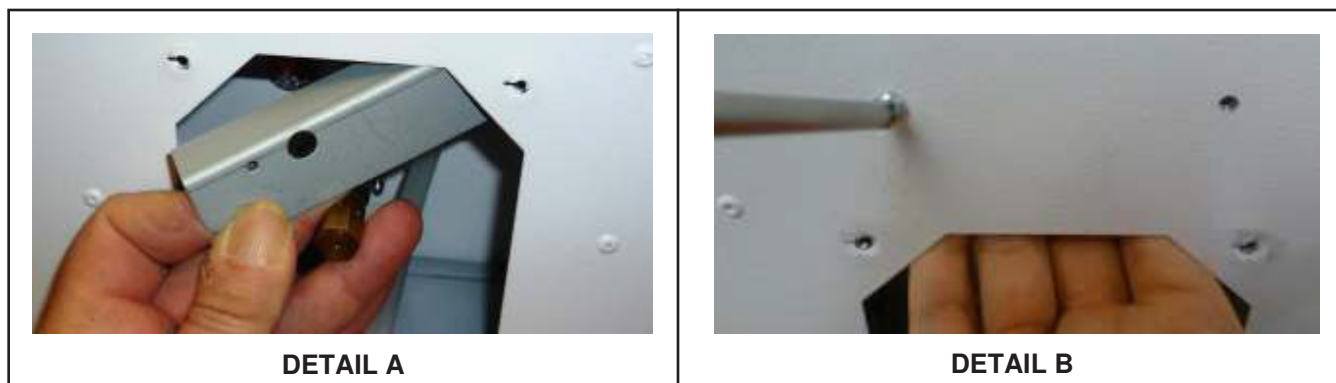


Figure 9. Baffle Plate Installation

8. Replace regulator springs in combination gas valve (see **Figure 10**):
 - a. Open access door/panel.
 - b. Remove brass cover screw(s), plastic adjustment screw(s), and existing regulator spring(s) from combination gas valve regulator sleeve.
 - c. Install replacement regulator spring(s) from gas valve conversion kit into regulator sleeve and thread adjustment screw approximately eight turns into sleeve.
 - d. Set correct gas pressure in accordance with **Table 3** by turning adjustment screw(s) IN (clockwise) to increase pressure or OUT (counterclockwise) to decrease pressure.
 - e. Re-install cover screw(s) and adhere small round LP label(s) from gas valve conversion kit to top of cover screw(s).
 - f. Close access door/panel.
 - g. Adhere warning label from gas valve conversion kit where it can easily be seen on outside of burner cabinet.

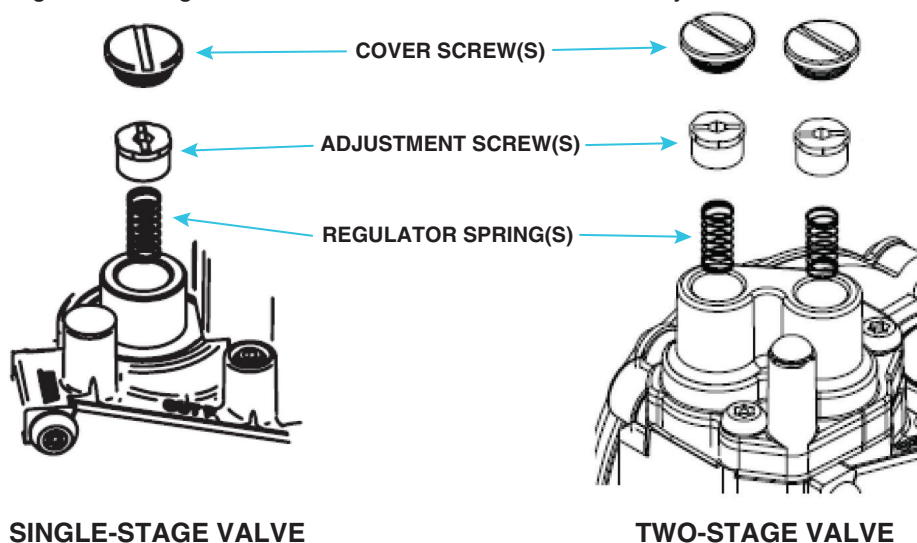


Figure 10. Combination Gas Valve Regulator Spring Replacement

Table 3. Gas Manifold Pressure for Propane Units										
Installation Location	Elevation (Feet (Meters))	Model	Burner Setting	Unit Size						170*
				060	080	100	125	150	170	
				Gas Manifold Pressure (IN WC)						
US	0–2000 (0–610)	VCS, VPS	—	5.5	5.2	8.0	7.6	7.0	6.1	7.0
		VCT, VPT	Low	3.5	2.9	4.4	4.6	3.3	3.6	—
			High	5.5	5.2	8.0	7.6	7.0	6.1	
	2001–5000 (611–1525)	VCS, VPS	—	5.5	5.2	8.0	7.6	7.0	—	7.0
		VCT, VPT	Low	3.5	2.9	4.4	4.6	3.3	—	
			High	5.5	5.2	8.0	7.6	7.0		
	5001–10,000 (1526–3045)	VCS, VPS	—	5.5	5.2	8.0	7.6	6.4	—	6.4
		VCT, VPT	Low	3.5	2.9	4.4	4.6	3.3	—	
			High	5.5	5.2	8.0	7.6	6.4		
Canada	0–2000 (0–610)	VCS, VPS	—	5.5	5.2	8.0	7.6	7.0	6.1	7.0
		VCT, VPT	Low	3.5	2.9	4.4	4.6	3.3	3.6	—
			High	5.5	5.2	8.0	7.6	7.0	6.1	
	2001–4500 (611–1373)	VCS, VPS	—	5.4	5.0	7.8	7.4	6.8	—	6.8
		VCT, VPT	Low	3.4	2.8	4.2	4.4	3.1	—	
			High	5.4	5.0	7.8	7.4	6.8		
*Generation ZZ units.										

*Generation ZZ units.

⚠ CAUTION ⚠

Burner inserts are NOT required for correct heater operation using propane.

INSTALLATION—CONTINUED

NOTE: A 5-foot (1,524-mm) burner insert (PN 270489) is used in unit sizes 060, 080, and 100. A 3-foot (914-mm) burner insert (PN 1005500) is used in unit size 125. The burner insert is installed in the first emitter tube where it is joined to the second emitter tube.

9. If heater has burner insert(s), remove insert(s) (see [Figure 11](#)).

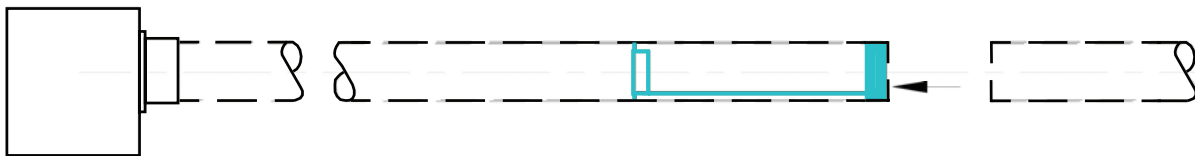


Figure 11. Burner Insert

NOTE: The following units require additional turbulator strip(s) (PN 116019): unit size 100 with S30 tube configuration requires one (1) additional and unit size 170 with S50 tube configuration requires two (2) additional. Furthermore, all turbulator strips **MUST BE REMOVED** for the following models at installation elevations >5,000 feet (>1,524 meters): unit size 150 of all models with U40 tube configuration and unit size 170 of models VCS and VPS with U40 tube configuration.

10. Install turbulator strip(s) as required:

- a. Interlock turbulator strip sections as shown in [Figure 12](#), DETAIL A.
- b. Slide connected sections into emitter tube(s) as shown in [Figure 12](#), DETAIL B. Add further strips to form required length.

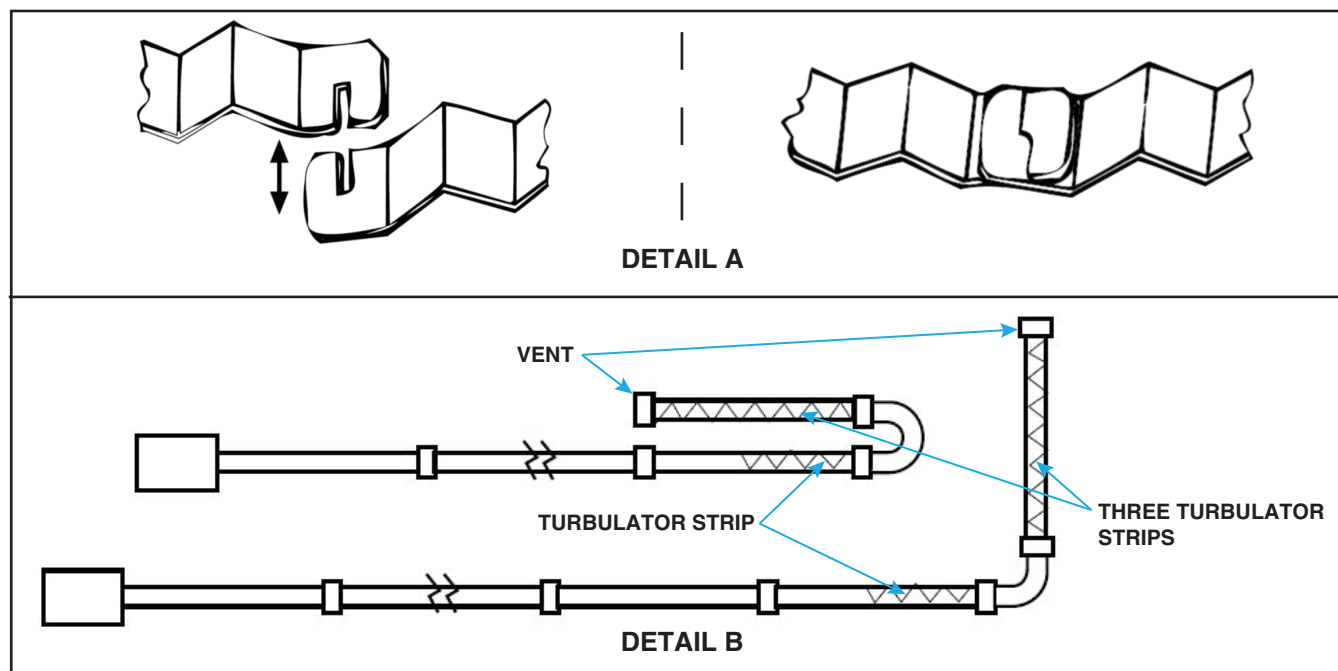


Figure 12. Turbulator Strip Installation

11. Reinstall burner assembly and burner support casting (see [Figure 1](#)):

- a. Run ignition, flame probe, and ground leads and pressure switch silicone tube through replacement gasket and reconnect leads and tube.
- b. Position burner support casting with replacement gasket and burner assembly so that wiring leads are not pinched and secure burner support casting to burner cabinet using four screws removed in step 4a.
- c. Re-install burner in emitter tube and tighten setscrew on burner support casting.

12. Replace fan orifice plate (plates are stamped with PN, refer to [Table 4](#) for applicability):

Table 4. Fan Orifice Plate Applicability for Propane Units							
Installation Location	Elevation (Feet (Meters))	Unit Size	Model				
			VCS, VPS		VCT, VPT		
			Heater Tube Configuration (Fan Orifice Plate PN)				
US	0–2000 (0–610)	060	S20–40, U20–40 (269924)		S20–40, U20–40 (269924)		
		080	S30–40, U20–40 (269925)		S30–40, U40 (269925)		
		100	S30–50, U40 (269929)		S30–40, U40 (269929)		
		125	S30–60, U40–60 (269931)		S30–50, U40 (269931)		
		150	S40–70, U40–60 (269933)		S40–60, U40–60 (269933)		
		170*	S50–80, U60–80 (269933)		—		
		170	S50–80, U60–80 (269937)		S50–70, U60 (269937)		
	2001–5000 (611–1525)	060	S20, U20 (269925)	S30–40, U40 (269924)	S20, U20 (269925)	S30–40, U40 (269924)	
		080	S30, U20 (269928)	S40, U40 (269925)	S30 (269928)	S40, U40 (269925)	
		100	S30 (1011095)	S40–50, U40 (269929)	S30 (1011095)	S40, U40 (269929)	
		125	S30–40 (269932)	S50–60, U40–60 (269931)	S30–40 (269932)	S50, U40 (269931)	
		150	S40, U40 (269934)	S50–70, U60 (269933)	S40, U40 (269934)	S50–60, U60 (269933)	
		170*	S40, U40 (269934)	S50–70, U60 (269933)	—		
	5001–8000 (1526–2440)	060	S20, U20 (269928)	S30–40, U40 (269925)	S20, U20 (269928)	S30–40, U40 (269925)	
		080	S30, U20 (269930)	S40, U40 (269928)	S30 (269930)	S40, U40 (269928)	
		100	S30 (269933)	S40–50, U40 (269932)	S30 (269933)	S40, U40 (269932)	
		125	S30–40 (269934)	S50–60, U40–60 (269933)	S30–40 (269934)	S50, U40 (269933)	
		150	S50–70, U40, U60 (1011096)		S50–60, U40, U60 (1011096)		
	170*	S50–70, U40, U60 (1011096)		—			
	8001–10,000 (2441–3045)	060	S20, U20 (269929)	S30–40, U40 (269928)	S20, U20 (269929)	S30–40, U40 (269928)	
		080	S30, U20 (1011095)	S40, U40 (269929)	S30 (1011095)	S40, U40 (269929)	
		100	S30 (269934)	S40–50, U40 (269933)	S30 (269934)	S40, U40 (269933)	
		125	S30–40 (1011096)	S50–60, U40–60 (269934)	S30–40 (1011096)	S50, U40 (269934)	
		150	S50–70, U40, U60 (1011096)		S40, U40, U60 (1011096)		
		170*	S50–70, U40, U60 (1011096)		—		
Canada	0–2000 (0–610)	060	S20–40, U20–40 (269924)		S20–40, U20–40 (269924)		
		080	S30–40, U20–40 (269925)		S30–40, U40 (269925)		
		100	S30–50, U40 (269929)		S30–40, U40 (269929)		
		125	S30–60, U40–60 (269931)		S30–50, U40 (269931)		
		150	S40–70, U40–60 (269933)		S40–60, U40–60 (269933)		
		170*	S50–80, U60–80 (269933)		S50–70, U60 (269937)		
		170	S60–80, U60–80 (269937)		—		
	2001–4500 (611–1373)	060	S20, U20 (269925)	S30–40, U40 (269924)	S20, U20 (269925)	S30–40, U40 (269924)	
		080	S30, U20 (269928)	S40, U40 (269925)	S30 (269928)	S40, U40 (269925)	
		100	S30 (1011095)	S40–50, U40 (269929)	S30 (1011095)	S40, U40 (269929)	
		125	S30–40 (269932)	S50–60, U40–60 (269931)	S30–40 (269932)	S50, U40 (269931)	
		150	S40, U40 (269934)	S50–70, U60 (269933)	S40, U40 (269934)	S50–60, U60 (269933)	
		170*	S40, U40 (269934)	S50–70, U60 (269933)	—		
		170					
*Generation ZZ units.							

*Generation ZZ units.

NOTE: If the tube configuration includes 5-foot tubes, the required fan orifice plate is for the next size downward (e.g., S35 requires an S30 plate, S55 requires an S50 plate, etc.).

- a. For model VCS, VCT, and VPT units:
 - (1) Remove and save four screws that secure top burner housing cover and remove cover to expose fan assembly.
 - (2) Remove and save four screws that secure fan assembly and remove fan assembly to access fan.
- b. For all models:
 - (1) For unit sizes 060–170, remove and save three nuts from fan studs (see [Figure 13](#), DETAIL A). For unit size 200, remove and save four screws that secure existing fan orifice plate (see [Figure 13](#), DETAIL B).
 - (2) Remove existing fan orifice plate and install replacement plate. Secure using existing fasteners. Take care not to cross-thread fasteners.

INSTALLATION—CONTINUED



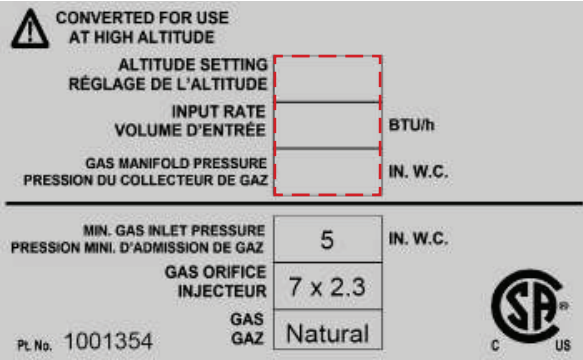
Figure 13. Fan Orifice Plate

- c. For model VPS generation ZZ units, replace fan flange plate:
 - (1) Remove four screws that secure fan outlet and unplug from burner box.
 - (2) Remove and save two screws that secure fan flange plate with fan support bracket to burner housing and remove fan and bracket assembly.
 - (3) Remove and save remaining two screws and remove existing fan flange plate.
 - (4) Install self-adhesive fan flange plate gasket on underside of replacement fan flange plate.
 - (5) Position replacement fan flange plate onto burner housing and secure using existing screws.
 - (6) Position fan with fan support bracket on top of fan flange plate, ensuring that fan outlet is placed OUTSIDE flange, and secure using existing screws.
 - (7) Secure fan outlet to housing using four self-tapping screws from kit.
- d. For model VCS, VCT, and VPT units, re-install fan assembly and top burner housing cover using existing fasteners.

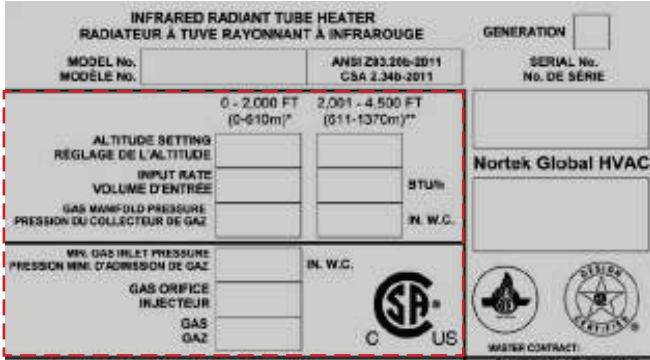
13. Install conversion label:

- a. Using permanent marker, fill in data on conversion label (see [Figure 14](#), DETAIL A) for installation elevation, heat input (refer to [Table 5](#)), and gas manifold pressure (refer to [Table 3](#)).
- b. Adhere label to existing data label on unit as shown in [Figure 14](#), DETAIL B).

NOTE: When a generation ZZ burner is converted to propane, it becomes a generation BB burner. The burner label needs to be modified in permanent ink to indicate this.



DETAIL A



DETAIL B

Figure 14. Typical Conversion Label

Table 5. Heat Input for Propane Units

Installation Location	Elevation (Feet (Meters))	Model	Burner Setting	Unit Size						
				060	080	100	125	150	170	170*
				BTUh						
US	0–2000 (0–610)	VCS, VPS	—	60,000	80,000	100,000	125,000	150,000	169,000	150,000
		VCT, VPT	Low	48,000	60,000	75,000	95,000	100,000	125,000	—
			High	60,000	80,000	100,000	123,500	150,000	169,000	
	2001–3000 (611–915)	VCS, VPS	—	56,400	75,200	94,000	117,500	141,000	—	141,000
		VCT, VPT	Low	45,120	56,400	70,500	89,300	94,000	—	
			High	56,400	75,200	94,000	116,090	141,000		
	3001–4000 (916–1220)	VCS, VPS	—	55,200	73,600	92,000	115,000	138,000	—	138,000
		VCT, VPT	Low	44,160	55,200	69,000	87,400	92,000	—	
			High	55,200	73,600	92,000	113,620	138,000		
	4001–5000 (1221–1525)	VCS, VPS	—	54,000	72,000	90,000	112,500	135,000	—	135,000
		VCT, VPT	Low	43,200	54,000	67,500	85,500	90,000	—	
			High	54,000	72,000	90,000	111,150	135,000		
	5001–6000 (1526–1830)	VCS, VPS	—	52,800	70,400	88,000	110,000	132,000	—	132,000
		VCT, VPT	Low	42,240	52,800	66,000	83,600	88,000	—	
			High	52,800	70,400	88,000	108,680	132,000		
	6001–7000 (1831–2135)	VCS, VPS	—	51,600	68,800	86,000	107,500	129,000	—	129,000
		VCT, VPT	Low	41,280	51,600	64,500	81,700	86,000	—	
			High	51,600	68,800	86,000	106,210	129,000		
	7001–8000 (2136–2440)	VCS, VPS	—	50,400	67,200	84,000	105,000	126,000	—	126,000
		VCT, VPT	Low	40,320	50,400	63,000	79,800	84,000	—	
			High	50,400	67,200	84,000	103,740	126,000		
	8001–9000 (2441–2745)	VCS, VPS	—	49,200	65,600	82,000	102,500	123,000	—	123,000
		VCT, VPT	Low	39,360	49,200	61,500	71,250	82,000	—	
			High	49,200	65,600	82,000	96,950	123,000		
	9001–10,000 (2746–3045)	VCS, VPS	—	48,000	64,000	80,000	100,000	120,000	—	120,000
		VCT, VPT	Low	38,400	48,000	60,000	69,350	80,000	—	
			High	48,000	64,000	80,000	94,480	120,000		
Canada	0–2000 (0–610)	VCS, VPS	—	60,000	80,000	100,000	125,000	150,000	169,000	150,000
		VCT, VPT	Low	48,000	60,000	75,000	95,000	100,000	125,000	—
			High	60,000	80,000	100,000	123,500	150,000	169,000	
	2001–4500 (611–1373)	VCS, VPS	—	54,000	72,000	90,000	112,500	135,000	—	135,000
		VCT, VPT	Low	43,200	54,000	67,500	85,500	90,000	—	
			High	54,000	72,000	90,000	112,500	135,000		
*Generation ZZ units.										

*Generation ZZ units.

14. For models VCS, VCT, and VPT with ducted combustion air, connect flexible hose to fresh air inlet on side of burner cabinet and secure using hose clamp.
15. Reconnect gas supply at union outside of cabinet and leak test connection using leak detecting solution. If leak is detected, tighten connection. If leak cannot be stopped by tightening connection, replace part(s).
16. Turn ON electric and gas.
17. Check for proper operation.

