

2 General venting

PVC/CPVC

This product has been approved for use with the PVC/CPVC vent materials listed in Table 2D.

Installing vent and air piping

⚠ WARNING

The vent connection to the appliance must be made with the starter CPVC pipe section provided with the 286-501 models (starter piece is factory installed on the 126-201 models) if PVC/CPVC vent is to be used. The field provided vent fittings must be cemented to the CPVC pipe section using an "All Purpose Cement" suitable for PVC and CPVC pipe. Use only the vent materials, primer, and cement specified in Table 2D to make the vent connections. Failure to follow this warning could result in fire, personal injury, or death.

NOTICE

Use only cleaners, primers, and solvents that are approved for the materials which are joined together.

NOTICE

All PVC vent pipes must be glued, properly supported, and the exhaust must be pitched a minimum of a 1/4 inch per foot back to the water heater (to allow drainage of condensate).

⚠ WARNING

Insulation should not be used on PVC or CPVC venting materials. The use of insulation will cause increased vent wall temperatures, which could result in vent pipe failure.

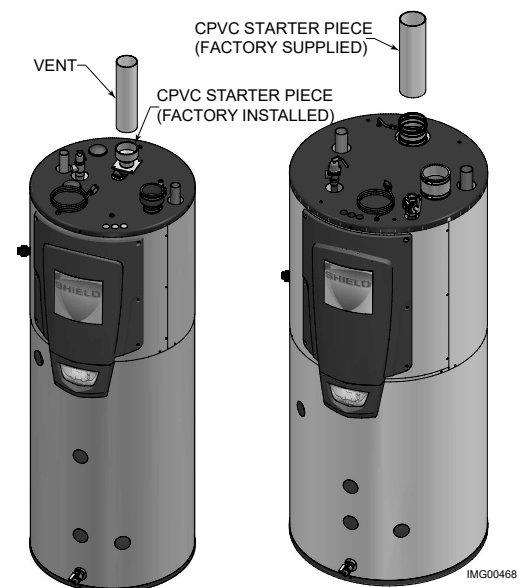
1. Work from the water heater to vent or air termination. Do not exceed the lengths given in this manual for the air or vent piping.
2. Cut pipe to the required lengths and deburr the inside and outside of the pipe ends.
3. Chamfer outside of each pipe end to ensure even cement distribution when joining.
4. Clean all pipe ends and fittings using a clean dry rag. (Moisture will retard curing and dirt or grease will prevent adhesion.)
5. Dry fit vent or air piping to ensure proper fit up before assembling any joint. The pipe should go a third to two-thirds into the fitting to ensure proper sealing after cement is applied.
6. Priming and Cementing:
 - a. Handle fittings and pipes carefully to prevent contamination of surfaces.
 - b. Apply a liberal even coat of primer to the fitting socket and to the pipe end to approximately 1/2" beyond the socket depth.
 - c. Apply a second primer coat to the fitting socket.
 - d. While primer is still wet, apply an even coat of approved cement to the pipe equal to the depth of the fitting socket along with an even coat of approved cement to the fitting socket.
 - e. Apply a second coat of cement to the pipe.
 - f. While the cement is still wet, insert the pipe into the fitting, if possible twist the pipe a 1/4 turn as you insert it. **NOTE:** If voids are present, sufficient cement was not applied and joint could be defective.
 - g. Wipe excess cement from the joint removing ring or beads as it will needlessly soften the pipe.

Table 2D PVC/CPVC Vent Pipe, and Fittings

Approved PVC/CPVC Vent Pipe and Fittings		
Item	Material	Standard
Vent pipe	PVC Schedule 40, 80	ANSI/ASTM D1785
	PVC - DWV	ANSI/ASTM D2665
	CPVC Schedule 40, 80	ANSI/ASTM F441
Vent fittings	PVC Schedule 40	ANSI/ASTM D2466
	PVC Schedule 80	ANSI/ASTM D2467
	CPVC Schedule 80	ANSI/ASTM F439
	PVC - DWV	ANSI/ASTM D2665
Pipe Cement / Primer	PVC	ANSI/ASTM D2564
	CPVC	ANSI/ASTM F493
NOTICE: DO NOT USE CELLULAR (FOAM) CORE PIPE		

NOTE: In Canada, CPVC and PVC vent pipe, fittings and cement/primer must be ULC-S636 certified.

Figure 2-7 Near Water Heater PVC/CPVC Venting



MODELS: 126-065 - 201-100

MODELS: 286-125 - 501-125

2 General venting *(continued)*

Polypropylene

This product has been approved for use with polypropylene vent with the manufacturers listed in Table 2E.

All terminations must comply with listed options in this manual and be a single-wall vent offering.

For support and special connections required, see the manufacturer's instructions. All vent is to conform to standard diameter and equivalent length requirements established.

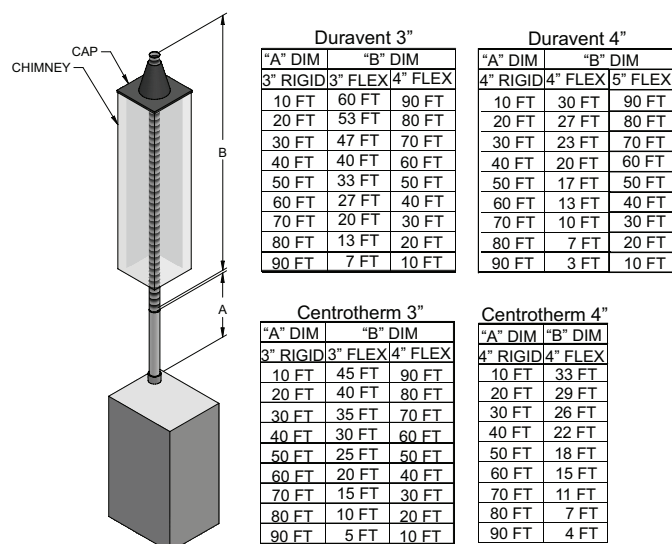
When determining equivalent combustion air and vent length for polypropylene single-wall piping:

- 1 foot of Duravent 4 inch single-wall pipe is equivalent to 1.6 feet of piping

Flexible polypropylene

For use of flex pipe, it is recommended to have the vent material in 32°F or higher ambient space before bending at installation. No bends should be made to greater than 45° and ONLY installed in vertical or near vertical installations (FIG. 2-8).

Figure 2-8 Near Boiler Flexible Polypropylene Venting



*NOTES: 1) FLEX PIPE MAY ONLY BE RUN IN A VERTICAL ORIENTATION
 2) ALL VENT LENGTHS REPRESENTED IN ABOVE CHARTS ARE EQUIVALENT LENGTHS.
 3) SECTION A IS EQUIVALENT FEET OF RIGID PIPE, WHICH MAY INCLUDE 45 AND 90° ELBOWS. PLEASE SEE SIZING SECTION FOR DETERMINING EQUIVALENT FEET.

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Table 2E Polypropylene Vent Pipe and Fittings

Approved Polypropylene Vent Manufacturers	
Make	Model
Centrotherm Eco Systems	InnoFlue SW/Flex
Duravent (M & G Group)	PolyPro Single-Wall / PolyPro Flex

Table 2F Approved Polypropylene Terminations

Model	Centrotherm InnoFlue SW				Duravent Polypro		
	Polypropylene Adapter	Joint Connector	Sidewall Retaining Bracket*	Sidewall Adapter*	Polypropylene Adapter	Joint Connector	Sidewall Kit*
126-065 -- 201-100	ISAAL0303	IAN503	IATP0303	ISTAGL0303	3PPS-ADL	3PPS-LB	3PPS-HLK
286-125 -- 501-125	ISAAL0404	IAN504	IATP0404	ISTAGL0404	4PPS-AD-M	4PPS-LB	4PPS-HLK

* These parts are only needed if the sidewall termination assembly is used (see FIG. 3-4B on page 28).

NOTICE

The installer must use a specific vent starter adapter at the flue collar connection. The adapter is supplied by the vent manufacturer to adapt to its vent system. See Table 2F for approved vent adapters. Discard CPVC starter piece.

NOTICE

All vent connections MUST be secured by the vent manufacturer's joint connector (FIG. 2-9).

WARNING

Insulation should not be used on polypropylene venting materials. The use of insulation will cause increased vent wall temperatures, which could result in vent pipe failure.

WARNING

Use only the adapters and vent system listed in Tables 2E and 2F. DO NOT mix vent systems of different types or manufacturers. Failure to comply could result in severe personal injury, death, or substantial property damage.

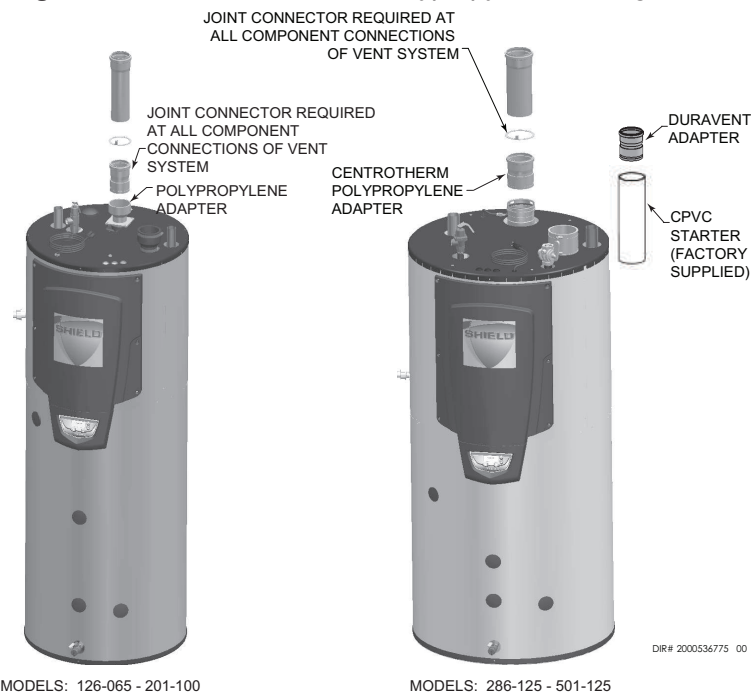
NOTICE

Installations must comply with applicable national, state, and local codes. For Canadian installation, polypropylene vent must be listed as a ULC-S636 approved system.

NOTICE

Installation of a polypropylene vent system should adhere to the vent manufacturer's installation instructions supplied with the vent system.

Figure 2-9 Near Water Heater Polypropylene Venting



2 General venting

Stainless steel vent

This product has been approved for use with stainless steel using the manufacturers listed in Table 2G. This unit requires Category IV venting.

⚠ WARNING

Use only the materials, vent systems, and terminations listed in Tables 2G and 2H. DO NOT mix vent systems of different types or manufacturers. Failure to comply could result in severe personal injury, death, or substantial property damage.

NOTICE

The installer must use a specific vent starter adapter at the flue collar connection, supplied by the vent manufacturer to adapt to its vent system. See Table 2H for approved vent adapters. Discard CPVC starter piece.

NOTICE

Installations must comply with applicable national, state, and local codes. Stainless steel vent systems must be listed as a UL-1738 approved system for the United States and a ULC-S636 approved system for Canada.

NOTICE

Installation of a stainless steel vent system should adhere to the stainless steel vent manufacturer's installation instructions supplied with the vent system.

Figure 2-10 Near Water Heater Stainless Steel Venting

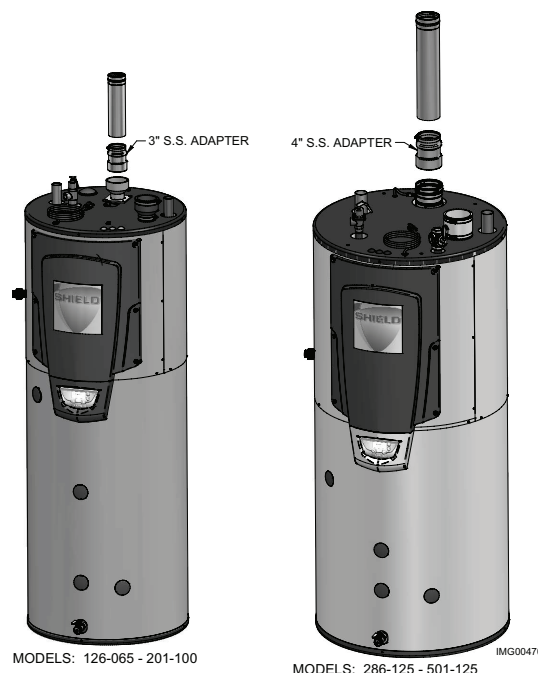


Table 2G Stainless Steel Vent Pipe and Fittings

Approved Stainless Steel Vent Manufacturers	
Make	Model
Dura Vent (M & G Group)	FasNSeal Vent / FasNSeal Flex* Vent
Z-Flex (Nova Flex Group)	Z-Vent
Heat Fab (Selkirk Corporation)	Saf-T Vent
Metal Fab	Corr/Guard
Security Chimney	Secure Seal

*Use of FasNSeal Flex smooth inner wall vent is to be used in vertical or near vertical sections only, taking precaution to ensure no sagging occurs of the vent system. Connect to the FasNSeal rigid vent using specially designed adapters and sealing method, see manufacturer's instructions.

Table 2H Approved Stainless Steel (S.S.) Terminations and Adapters

Model	ProTech			Heat Fab			Z Flex		
	FasNSeal			Saf-T Vent			Z-Vent		
	S.S. Adapter	Flue Termination	Intake Air Termination	S.S. Adapter	Flue Termination	Intake Air Termination	S.S. Adapter	Flue Termination	Intake Air Termination
126-065 -- 201-125	300715	FSBS3 FSRC3(R.C)	303889	9301PVC	9392 5300CI	9314TERM	2SVSLA03	2SVSTP03 2SVSRCX03	2SVSTEX0390
286-125 -- 501-125	F303759	FSBS4 FSRC4(R.C.)	FSAIH04 303888	9401PVC	9492 5400CI	9414TERM	2SVSLA04	2SVSTP04 2SVSRCX04	2SVSTEX0490
Metal Fab				Security Chimney					
Corr/Guard				Secure Seal					
126-065 -- 201-125	3CGIA	3CGSWHT 3CGSWC	3CGSW90LT	--	--	--			
286-125 -- 501-125	4CGIA	4CGSWHT 4CGSWC	4CGSW90LT	SS4PVCU	SS4STU SS4RCBU	SS4ST90AU			

3 Sidewall direct venting

Vent/air termination – sidewall

⚠ WARNING Follow instructions below when determining vent location to avoid possibility of severe personal injury, death, or substantial property damage.

⚠ WARNING A gas vent extending through an exterior wall shall not terminate adjacent to a wall or below building extensions such as eaves, parapets, balconies, or decks. Failure to comply could result in severe personal injury, death, or substantial property damage.

Determine location

Locate the vent/air terminations using the following guidelines:

- The total length of piping for vent or air must not exceed the limits given in the General Venting Section on page 17 of this manual.
- You must consider the surroundings when terminating the vent and air:
 - Position the vent termination where vapors will not damage nearby shrubs, plants or air conditioning equipment or be objectionable.
 - The flue products will form a noticeable plume as they condense in cold air. Avoid areas where the plume could obstruct window views.
 - Prevailing winds could cause freezing of condensate and water/ice buildup where flue products impinge on building surfaces or plants.
 - Avoid possibility of accidental contact of flue products with people or pets.
 - Do not locate the terminations where wind eddies could affect performance or cause recirculation, such as inside building corners, near adjacent buildings or surfaces, window wells, stairwells, alcoves, courtyards, or other recessed areas.

⚠ WARNING Sidewall vent and air inlet terminations must terminate in the same pressure zone.

- Do not terminate above any door or window. Condensate can freeze, causing ice formations.
- Locate or guard vent to prevent condensate damage to exterior finishes.
- Do not locate the terminations over public walkways.
- Do not locate the terminations near soffit vents, crawl space vents, or other areas where condensate or vapor could create a nuisance, hazard, or cause property damage.
- Do not locate the terminations where condensate vapor could cause damage or could be detrimental to the operation of regulators, relief valves, or other equipment.

Figure 3-1A PVC/CPVC/Polypropylene Sidewall Termination of Air and Vent

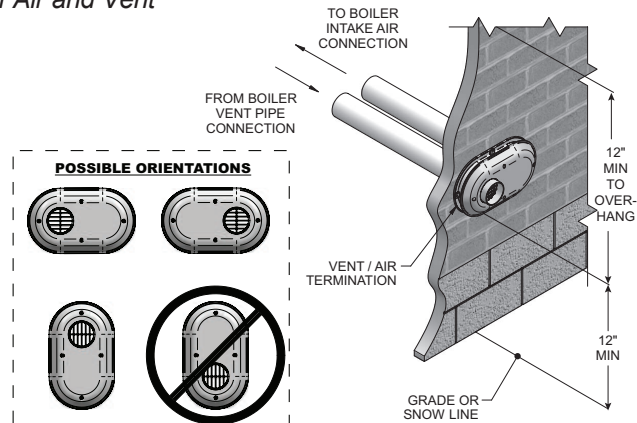


Table 3A Sidewall Vent Kits

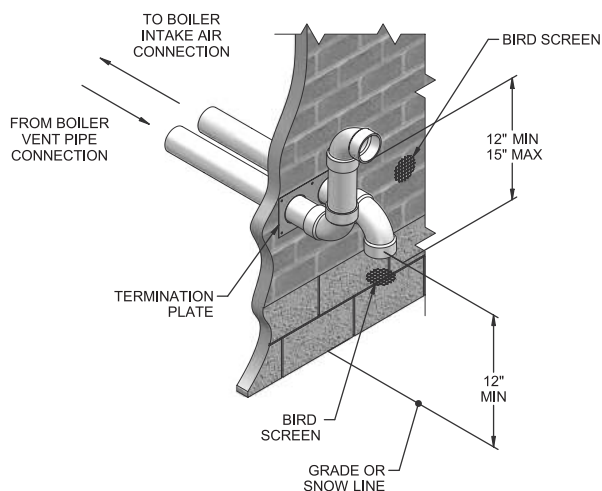
Model	Kit Number	Vent Size
126-065 -- 201-100	100157610	3 inch vent
286-125 -- 501-125	100157611	4 inch vent

If using the alternate sidewall termination:

- The air piping must terminate in a down-turned elbow as shown in FIG. 3-1B. This arrangement avoids recirculation of flue products into the combustion air stream.
- The vent piping must terminate in an elbow pointed outward or away from the air inlet, as shown in FIG. 3-1B.

⚠ WARNING Do not exceed the maximum lengths of the outside vent piping shown in FIG. 3-1B. Excessive length exposed to the outside could cause freezing of condensate in the vent pipe, resulting in potential water heater shutdown.

Figure 3-1B Alternate PVC/CPVC/Polypropylene Sidewall Termination of Air and Vent w/Field Supplied Fittings



3 Sidewall direct venting

Vent/air termination – sidewall

Figure 3-1C Alternate PVC/CPVC/SS/ Polypropylene Venting Arrangement (if Space Allows) w/Field Supplied Fittings

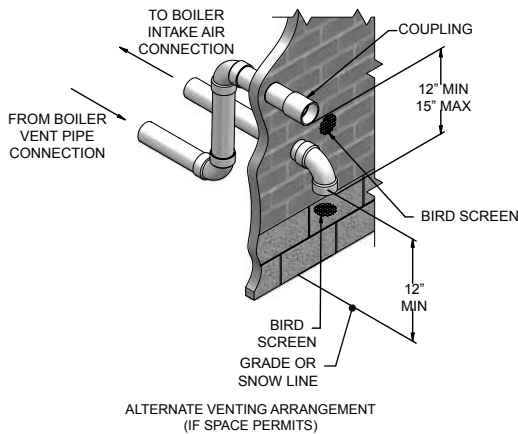
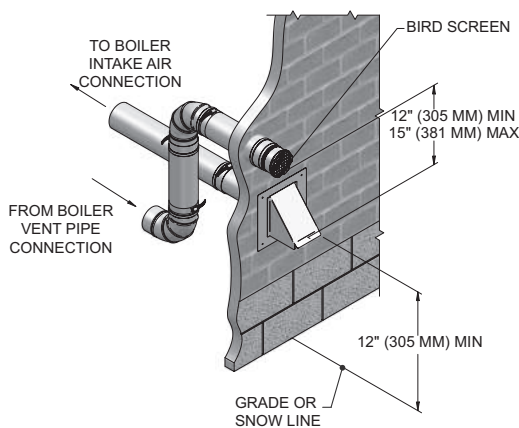


Figure 3-1D Alternate SS Venting Arrangement - Typical Stainless Steel Sidewall Termination of Air and Vent w/Field Supplied Fittings, Utilizing a Hood Intake



5. Maintain clearances as shown in FIG.'s 3-1A thru 3-3B, pages 23 - 27. Also maintain the following:
 - a. Vent must terminate:
 - At least 6 feet from adjacent walls.
 - No closer than 12 inches below roof overhang.
 - b. Air inlet must terminate at least 12 inches above grade or snow line; at least 12 inches below the vent termination; and the vent pipe must not extend more than 24 inches vertically outside the building as shown in FIG. 3-1B. Condensate could freeze and block vent pipe.
 - c. Do not terminate closer than 4 feet horizontally from any electric meter, gas meter, regulator, relief valve, or other equipment. Never terminate above or below any of these within 4 feet horizontally.

6. Locate terminations so they are not likely to be damaged by foreign objects, such as stones or balls, or subject to buildup of leaves or sediment.

Figure 3-2A Clearance to Gravity Air Inlets

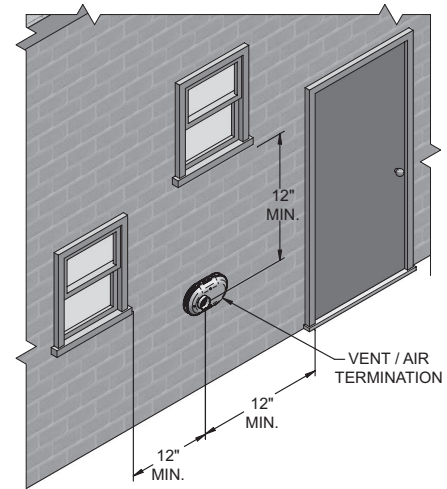
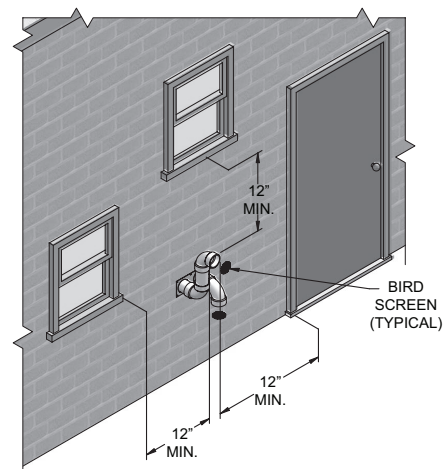


Figure 3-2B Alternate Clearance to Gravity Air Inlets w/ Field Supplied Fittings



3 Sidewall direct venting *(continued)*

Figure 3-3A Direct Vent Terminal Clearances

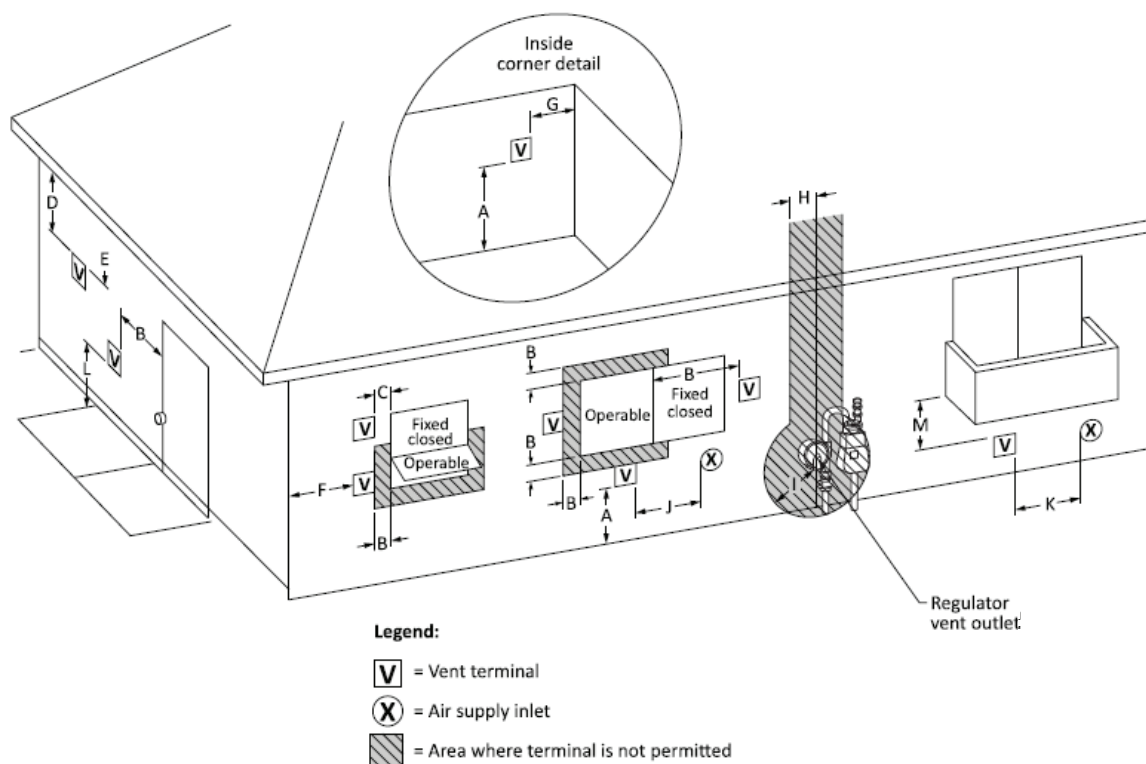


Table 3B Direct Vent Terminal Clearances

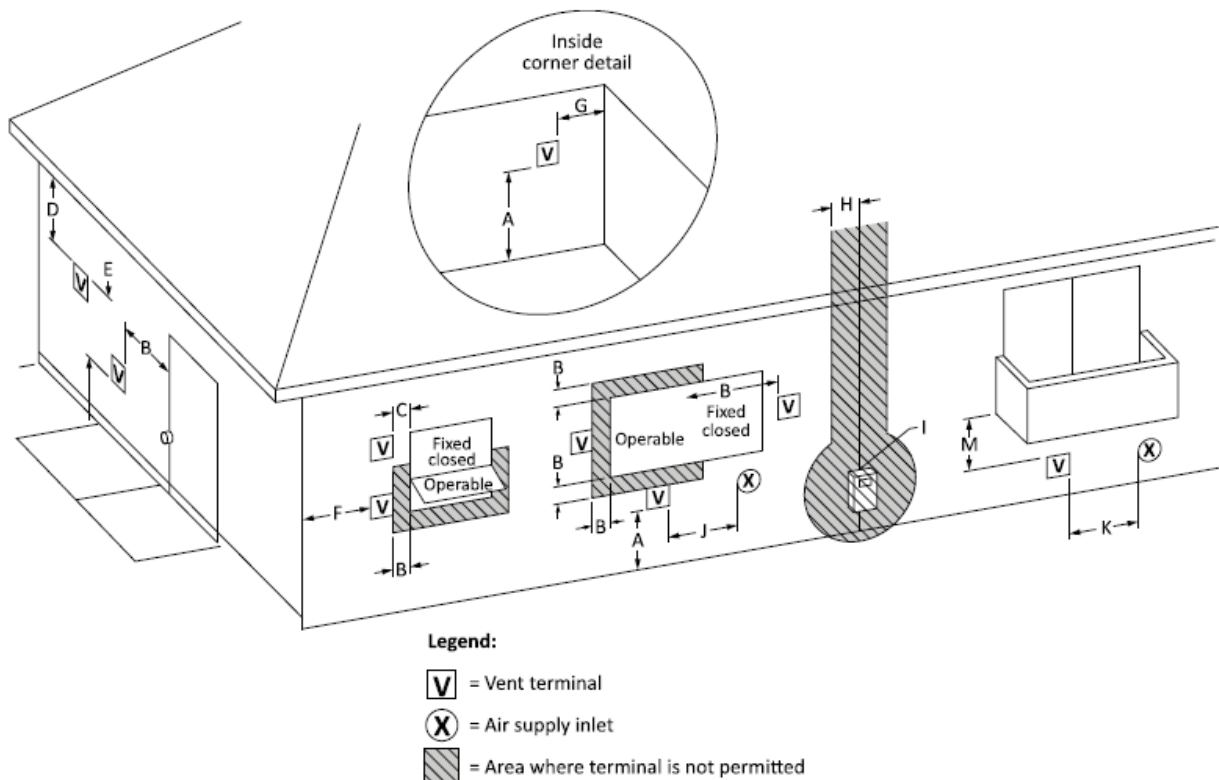
		Canadian Installations ¹	US Installations ²
A =	Clearance above grade, veranda, porch, deck, or balcony	12 in (30 cm)	12 in (30 cm)
B =	Clearance to window or door that may be opened	6 in (15 cm) for appliances ≤ 10,000 Btuh (3 kW), 12 in (30 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 100,000 Btuh (30 kW), 36 in (91 cm) for appliances > 100,000 Btuh (30 kW)	6 in (15 cm) for appliances ≤ 10,000 Btuh (3 kW), 9 in (23 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 50,000 Btuh (15 kW), 12 in (30 cm) for appliances > 50,000 Btuh (15 kW)
C =	Clearance to permanently closed window	*	*
D =	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 ft (61 cm) from the center line of the terminal.	*	*
E =	Clearance to unventilated soffit	*	*
F =	Clearance to outside corner	*	*
G =	Clearance to inside corner	*	*
H =	Clearance to each side of center line extended above meter / regulator assembly	*	*
I =	Clearance to service regulator vent outlet	Above a regulator within 3 ft (91 cm) horizontally of the vertical center line of the regulator vent outlet to a maximum vertical distance of 15 ft (4.5 m)	*

3 Sidewall direct venting

Table 3B Direct Vent Terminal Clearances (continued)

J =	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	6 in (15 cm) for appliances $\leq 10,000$ Btuh (3kW), 12 in (30 cm) for appliances $> 10,000$ Btuh (3 kW) and $\leq 100,000$ Btuh (30 kW), 36 in (91 cm) for appliances $> 100,000$ Btuh (30 kW)	6 in (15 cm) for appliances $\leq 10,000$ Btuh (3kW), 9 in (23 cm) for appliances $> 10,000$ Btuh (3 kW) and $\leq 50,000$ Btuh (15 kW), 12 in (30 cm) for appliances $> 50,000$ Btuh (15 kW)
K =	Clearance to a mechanical air supply inlet	6 ft (1.83 m)	3 ft (91 cm) above if within 10 ft (3 m) horizontally
L =	Clearance above paved sidewalk or paved driveway located on public property	7 ft (2.13 m)†	*
M =	Clearance under veranda, porch, deck, or balcony	12 in (30 cm)‡	*
* Clearance in accordance with local installation codes and the requirements of the gas supplier. † A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings. ‡ Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor. NOTES: 1) In accordance with the current CSA B149.1, Natural Gas and Propane Installation Code 2) In accordance with the current ANSI Z223.1/NFPA 54, National Fuel Gas Code			

Figure 3-3B Other than Direct Vent Terminal Clearances



3 Sidewall direct venting *(continued)*

Table 3C Other than Direct Vent Terminal Clearances

		Canadian Installations¹	US Installations²
A =	Clearance above grade, veranda, porch, deck, or balcony	12 in (30 cm)	12 in (30 cm)
B =	Clearance to window or door that may be opened	6 in (15 cm) for appliances ≤ 10,000 Btuh (3 kW), 12 in (30 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 100,000 Btuh (30 kW), 36 in (91 cm) for appliances > 100,000 Btuh (30 kW)	4 ft (1.2 m) below or to side of opening; 1 ft (300 mm) above opening
C =	Clearance to permanently closed window	*	*
D =	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 2 ft (61 cm) from the center line of the terminal.	*	*
E =	Clearance to unventilated soffit	*	*
F =	Clearance to outside corner	*	*
G =	Clearance to inside corner	*	*
H =	Clearance to each side of center line extended above meter / regulator assembly	*	*
I =	Clearance to service regulator vent outlet	Above a regulator within 3 ft (91 cm) horizontally of the vertical center line of the regulator vent outlet to a maximum vertical distance of 15 ft (4.5 m)	*
J =	Clearance to nonmechanical air supply inlet to building or the combustion air inlet to any other appliance	6 in (15 cm) for appliances ≤ 10,000 Btuh (3kW), 12 in (30 cm) for appliances > 10,000 Btuh (3 kW) and ≤ 100,000 Btuh (30 kW), 36 in (91 cm) for appliances > 100,000 Btuh (30 kW)	4 ft (1.2 m) below or to side of opening; 1 ft (300 mm) above opening
K =	Clearance to a mechanical air supply inlet	6 ft (1.83 m)	3 ft (91 cm) above if within 10 ft (3 m) horizontally
L =	Clearance above paved sidewalk or paved driveway located on public property	7 ft (2.13 m)†	7 ft (2.13 m)
M =	Clearance under veranda, porch, deck, or balcony	12 in (30 cm)‡	*

* Clearance in accordance with local installation codes and the requirements of the gas supplier.

† A vent shall not terminate directly above a sidewalk or paved driveway that is located between two single family dwellings and serves both dwellings.

‡ Permitted only if veranda, porch, deck, or balcony is fully open on a minimum of two sides beneath the floor.

NOTES:

1) In accordance with the current CSA B149.1, Natural Gas and Propane Installation Code

2) In accordance with the current ANSI Z223.1/NFPA 54, National Fuel Gas Code