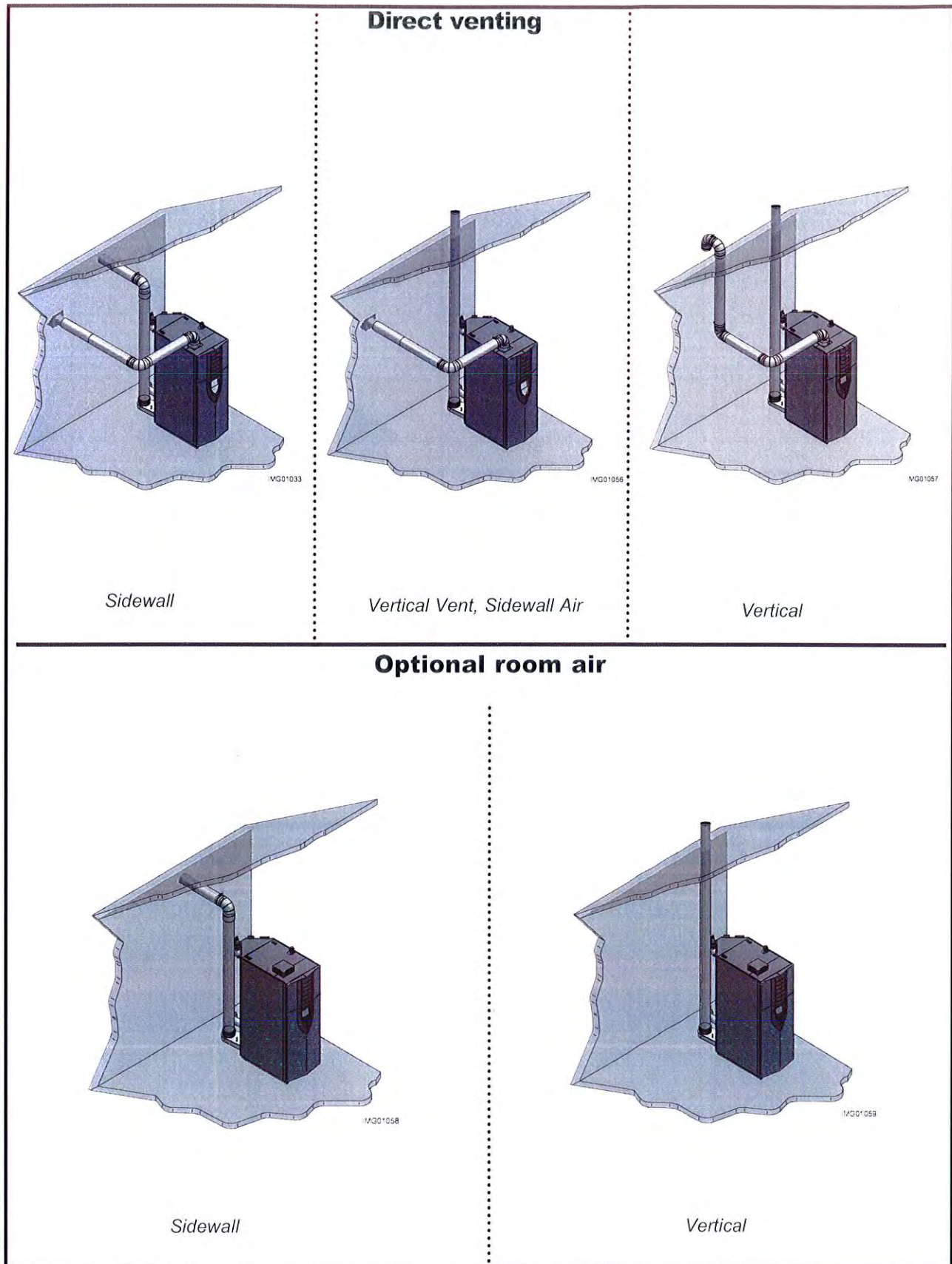


2 General venting



2 General venting *(continued)*

Install vent and combustion air piping

DANGER

The Crest must be vented and supplied with combustion and ventilation air as described in this section. Ensure the vent and air piping and the combustion air supply comply with these instructions regarding vent system, air system, and combustion air quality. See also Section 1 of this manual.

Inspect finished vent and air piping thoroughly to ensure all are airtight and comply with the instructions provided and with all requirements of applicable codes.

Failure to provide a properly installed vent and air system will cause severe personal injury or death.

Air inlet pipe materials:

The air inlet pipe(s) must be sealed. Choose acceptable combustion air inlet pipe materials from the following list:

- ABS, PVC, or CPVC
- Dryer Vent or Sealed Flexible Duct (not recommended for rooftop air inlet)
- Galvanized steel vent pipe with joints and seams sealed as specified in this section.
- Type "B" double-wall vent with joints and seams sealed as specified in this section.
- AL29-4C, stainless steel material to be sealed to specification of its manufacturer.

*Plastic pipe may require an adapter (not provided) to transition between the air inlet connection on the appliance and the plastic air inlet pipe.

WARNING

Using vent or air intake materials other than those specified, failure to properly seal all seams and joints or failure to follow vent pipe manufacturer's instructions can result in personal injury, death or property damage. Mixing of venting materials will void the warranty and certification of the appliance.

NOTICE

The use of double-wall vent or insulated material for the combustion air inlet pipe is recommended in cold climates to prevent the condensation of airborne moisture in the incoming combustion air.

Sealing of Type "B" double-wall vent material or galvanized vent pipe material used for air inlet piping on a sidewall or vertical rooftop Combustion Air Supply System:

- a. Seal all joints and seams of the air inlet pipe using either Aluminum Foil Duct Tape meeting UL Standard 723 or 181A-P or a high quality UL Listed silicone sealant such as those manufactured by Dow Corning or General Electric.
- b. Do not install seams of vent pipe on the bottom of horizontal runs.
- c. Secure all joints with a minimum of three sheet metal screws or pop rivets. Apply Aluminum Foil Duct Tape or silicone sealant to all screws or rivets installed in the vent pipe.
- d. Ensure that the air inlet pipes are properly supported.

The PVC, CPVC, or ABS air inlet pipe should be cleaned and sealed with the pipe manufacturer's recommended solvents and standard commercial pipe cement for the material used. The ABS, PVC, CPVC, Dryer Vent or Flex Duct air inlet pipe should use a silicone sealant to ensure a proper seal at the appliance connection and the air inlet cap connection. Dryer vent or flex duct should use a screw type clamp to seal the vent to the appliance air inlet and the air inlet cap. Proper sealing of the air inlet pipe ensures that combustion air will be free of contaminants and supplied in proper volume.

2 General venting

When a sidewall or vertical rooftop combustion air supply system is disconnected for any reason, the air inlet pipe must be resealed to ensure that combustion air will be free of contaminants and supplied in proper volume.

DANGER Failure to properly seal all joints and seams as required in the air inlet piping may result in flue gas recirculation, spillage of flue products and carbon monoxide emissions causing severe personal injury or death.

Vent and air piping

The Crest is certified as a Category II/IV boiler. **This product has been approved for use with stainless steel vent systems.** All venting systems used with a Crest boiler must be suitable for Category IV operation except for factory approved common vent systems operating as allowed in the Common Venting Section on page 20.

WARNING Use only the materials, vent systems, and terminations listed in Table 2A-1. **DO NOT** mix vent systems of different types or manufacturers, unless listed in this manual. 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. 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.

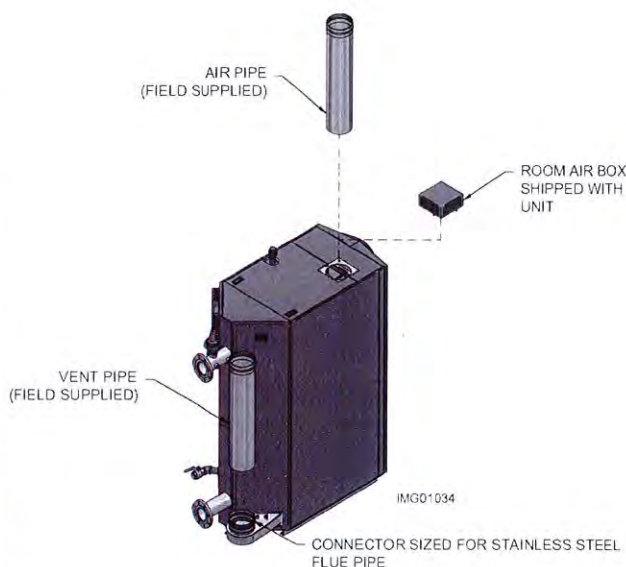
NOTICE Installation of a stainless steel vent system should adhere to the stainless steel vent manufacturer's installation instructions supplied with the vent system.

NOTICE The Crest is supplied with an integral FasNSeal vent connector (FIG. 2-1). The installer must use a specific vent starter adapter supplied by the vent manufacturer to adapt to different vent systems.

Air intake/vent connections

1. **Combustion Air Intake Connector** (FIG. 2-1) - Used to provide combustion air directly to the unit from outdoors. A fitting is provided with the unit for final connection. Combustion air piping must be supported per guidelines listed in the National Mechanical Code, Section 305, Table 305.4 or as local codes dictate.
2. **Vent Connector** (FIG. 2-1) - Used to provide a passageway for conveying combustion gases to the outside. A transition fitting is provided on the unit for final connection. Vent piping must be supported per the National Building Code, Section 305, Table 305.4 or as local codes dictate.

Figure 2-1 Combustion Air Adapter



The Crest uses model specific combustion air intake and vent piping sizes as detailed in Tables 2B and 2C on page 18.

NOTICE Increasing or decreasing combustion air or vent piping to sizes not specified in this manual is not authorized.

Table 2A-1 Approved Stainless Steel Vent Manufacturers

Approved Stainless Steel Vent Manufacturers	
Make	Model
ProTech Systems (Dura-Vent Co.)	FasNSeal Vent
Z-Flex (Nova Flex Group)	Z-Vent
Heat Fab (Selkirk Corporation)	Saf-T Vent
Metal Fab	Corr/Guard
Securities Chimneys International	Secure Seal SS
Schebler Chimney Systems	eVent
ICC	VIC
Jeremias	--

2 General venting *(continued)*

Table 2A-2 Approved Stainless Steel Terminations and Adapters - Category IV

Model	ProTech			Z Flex			Heat Fab		
	Adapter	Intake		Adapter	Intake		Adapter	Flue	Intake
751-1001	Not Required	810003269		2SVDSA06	2SVEE0690		9601MAD	CCK06TM	9690 / 9692
1251	*See note	810003281		2SVDSA06	2SVEE0690		9801MAD	CCK08TM	9690 / 9692
1501-2001	*See note	810003357 / 810003369		2SVDSA08	2SVEE0890		9801MAD	CCK08TM	9890 / 9892
Model	Metal-Fab			Security Chimney			ICC		
	Adapter	Flue	Intake	Adapter	Flue	Intake	Adapter	Flue	Intake
751-1001	6FCGPVCA	MC 6-36"	6FCGSW90L	SS6PVCU	SS0MCU 4" - 24"	SS6ST90AU SSD0STAU 4" - 24"	HM-06CA78	HM-06SCR-F HM-06RC-F	HE-06E90-F HM-06SCR-F
1251	8FCGLCA	MC 6-36"	6FCGSW90L	SS8CRESTU	SS0MCU 4" - 24"	SS6ST90AU SSD0STAU 4" - 24"	HM-08CA78	HM-08SCR-F HM-08MC-F	HE-06E90-F HM-06SCR-F
1501-2001	8FCGLCA	MC 6-36"	8FCGSW90	SS8CRESTU	SS0MCU 4" - 24"	SSE8E90U SD0STAU 4" - 24"	HM-08CA78	HM-08SCR-F HM-08MC-F	HE-08E90-F HM-08SCR-F
Model	Jeremias			*No adapter needed when using 8" FasNSeal vent length. *Models 1251 - 1501: For installations using 6" vent, install a FasNSeal reducing adapter, available from the factory with kit #100295900. Reference the manufacturer's part number provided for Models 751 - 1001 when adapting to different vent systems.					
	Adapter	Flue	Intake						
751-1001	SWKL6-KLC	SWKL6-WRC	SWKL6-90ET						
1251	SWKL8-KLC	SWKL8-WRC	SWKL8-90ET						
1501-2001	SWKL8-KLC	SWKL8-WRC	SWKL8-90ET						
Model	ProTech			Z Flex			Heat Fab		
	Adapter	Intake		Adapter	Intake		Adapter	Flue	Intake
2501	*See note	810003397 / 810003409		2SVDSA09	2SVEE990		9901MAD	CCK09TM	9890 / 9992
3001 - 3501	*See note	810003435 / 810003447		2SVDSA10	2SVEE1090		91001MAD	CCK10TM	91090 / 91092
4001	*See note	810003476 / 810003488		2SVDSA12	2SVEE1290		91201MAD	CCK12TM	91290 / 91292
5001 - 6001	*See note	810003516 / 810003528		2SVDSA14	2SVEE1490		91401MAD	CCK14TM	91490 / 91492
Model	Metal-Fab			Security Chimney			ICC		
	Adapter	Flue	Intake	Adapter	Flue	Intake	Adapter	Flue	Intake
2501	8FCGLCA	MC 6-36"	8FCGSW90	SS9CRESTU	SS0MCU 4" - 24"	SSE9E90U SD0ST90AUK 4" - 10"	HM-09CA78	HM-09SCR-F HM-09MC-F	HE-08E90-F HM-08SCR-F
3001 - 3501	10FCGLCA	MC 6-36"	10FCGSW90	SS10CRESTU	SS0MCU 4" - 24"	SSE10E90U SD0ST90AUK 4" - 10"	HM-10CA78	HM-10SCR-F HM-10MC-F	HE-10E90-F HM-10SCR-F
4001	12FCGLCA	MC 6-36"	12FCGSW90	SS12CRESTU	SS0MCU 4" - 24"	SSE12E90U	HM-12CA78	HM-12SCR-F HM-12MC-F	HE-12E90-F HM-12SCR-F
5001 - 6001	14FCGLCA	MC 6-36"	14FCGSW90	SS14CRESTU	SS0MCU 4" - 24"	SSE14E90U	HM-14CA78	HM-14SCR-F HM-14MC-F	HE-14E90-F HM-14SCR-F
Model	Jeremias			*No adapter needed when using Standard FNS Vent Length.					
	Adapter	Flue	Intake						
2501	SWKL9-KLC	SWKL9-WRC	SWKL9-90ET						
3001 - 3501	SWKL10-KLC	SWKL10-WRC	SWKL10-90ET						
4001	SWKL12-KLC	SWKL12-WRC	SWKL12-90ET						
5001 - 6001	SWKL14-KLC	SWKL14-WRC	SWKL14-90ET						

2 General venting

Table 2B Direct Vent Minimum / Maximum Allowable Air / Vent Lengths

Model	AIR INLET			VENT			Input De-Rate per 25 feet of Vent
	Air Intake Diameter	Air Intake Min. Length	Air Intake Max. Length	Vent Diameter	Vent Min. Length	Vent Max. Length	
0751-1001	6"	12'	100'	6"	18'	100'	0%
1251*	6"	12'	75'	6"	18'	75'	1%
1251	6"	12'	100'	8"	18'	100'	0%
1501*	8"	12'	75'	6"	18'	75'	1%
1501	8"	12'	100'	8"	18'	100'	0%
1751-2001	8"	12'	100'	8"	18'	100'	0%
2501	8"	12'	100'	9"	18'	100'	0%
2501*	8"	12'	100'	10"	18'	100'	0%
3001	10"	12'	100'	10"	18'	100'	0%
3501	10"	12'	100'	10"	18'	100'	0%
4001	12"	12'	100'	12"	18'	100'	0%
5001/6001	14"	12'	100'	14"	18'	100'	0%

*FB 1251 - 1501 models using 6" vent require the installation of a field supplied reducing adapter (see Table 2A-2 on page 17).

*FB 1251 - 1501 LP models using 6" diameter vent will de-rate 2.5% per 25 feet of vent.

*FB 2501 models using 10" vent diameter option must use appropriate increase adapters as needed.

Table 2C Room Air Minimum / Maximum Allowable Air / Vent Lengths

Model	Vent Diameter	Vent Min. Length	Vent Max. Length	Input De-Rate per 25 feet of Vent
0751-1001	6"	18'	100'	0%
1251-1501*	6"	18'	100'	0%
1251-1501	8"	18'	100'	0%
1751-2001	8"	18'	100'	0%
2501	9"	18'	150'	0%
2501*	10"	18'	150'	0%
3001	10"	18'	150'	0%
3501	10"	18'	150'	0%
4001	12"	18'	150'	0%
5001/6001	14"	18'	150'	0%

*FB 1251 - 1501 models using 6" vent require the installation of a field supplied reducing adapter (see Table 2A-2 on page 17).

*FB 1251 - 1501 LP models using 6" diameter vent will de-rate 2.5% per 25 feet of vent.

*FB 2501 models using 10" vent diameter option must use appropriate increase adapters as needed.

2 General venting *(continued)*

When determining equivalent combustion air and vent length, add 5 feet (1.5m) for each 90° elbow and 3 feet (.9 m) for each 45° elbow.

EXAMPLE: 20 feet (6 m) of pipe + (4) 90° elbows + (3) 45° elbows = 49 equivalent feet (15 m) of piping.

Removing from existing vent

Follow the instructions in Section 1, page 10 of this manual when removing a boiler from an existing vent system.

Vent and air piping

Vent and air system:

NOTICE

Installation must comply with local requirements and with the National Fuel Gas Code, NFPA 54 / ANSI Z223.1 for U.S. installations or CSA B149.1 for Canadian installations.

You must also install air piping from outside to the boiler air intake adapter. The resultant installation is direct vent (sealed combustion).

You may use any of the vent/air piping methods covered in this manual. Do not attempt to install the Crest using any other means.

WARNING

DO NOT mix components from different systems. The vent system could fail, causing leakage of flue products into the living space. Use only approved stainless steel pipe and fittings.

NOTICE

When installing outdoor models OF(N,L), reference the Outdoor Crest Supplemental Manual for further information.

Vent, air piping and termination:

The Crest vent and air piping can be installed through the roof or through a sidewall. Follow the procedures in this manual for the method chosen. Refer to the information in this manual to determine acceptable vent and air piping length.

Air contamination

Pool and laundry products and common household and hobby products often contain fluorine or chlorine compounds. When these chemicals pass through the boiler, they can form strong acids. The acid can eat through the boiler wall, causing serious damage and presenting a possible threat of flue gas spillage or boiler water leakage into the building.

Please read the information given in Table 1A, page 9, listing contaminants and areas likely to contain them. If contaminating chemicals will be present near the location of the boiler combustion air inlet, have your installer pipe the boiler combustion air and vent to another location, per this manual.

WARNING

If the boiler combustion air inlet is located in a laundry room or pool facility, for example, these areas will always contain hazardous contaminants.

WARNING

To prevent the potential of severe personal injury or death, check for areas and products listed in Table 1A, page 9 before installing the boiler or air inlet piping.

If contaminants are found, you **MUST**:

- Remove products permanently.
- OR—
- Relocate air inlet and vent terminations to other areas.

2 General venting

Common venting

Crest boilers may be common vented; however, the following criteria **MUST BE** followed:

1. Only Crest boilers may be connected to common flue applications. **DO NOT** mix other manufacturer's appliances or other Lochinvar models. Common air intake is not allowed.
2. Crest boilers connected to the common vent must all be of the same size.
3. Each Crest boiler must have a Lochinvar supplied flue damper installed (see Table 2D).
4. A condensate drain must be installed above the flue damper.
5. Only vertical direct vent, positive pressure, Category IV or vertical/chimney vent, negative pressure, Category II may be used when common venting Crest boilers. Sidewall venting is not allowed.
6. Crest boilers in a common vent must be connected and controlled with the integral Crest SMART TOUCH Cascade.
 - a. The Leader may be controlled through the Crest SMART TOUCH control through BMS (external 0 - 10V signal), ModBus or its own internally calculated set point.
 - b. The Cascade (Members) must be controlled by the Crest Leader boiler using the Lead/Lag Cascade option.

For approved common vent sizing, contact the factory.

WARNING When Crest boilers are common vented, the criteria above **MUST BE** followed. Failure to follow all these requirements will result in severe personal injury, death, or substantial property damage.

NOTICE When Crest boilers are common vented, hot water generators **MUST BE** piped to the primary heating loop and tank thermostats must not be connected to the Crest.

NOTICE A field supplied inline condensate collection section **MUST BE** installed directly above the backflow preventer.

NOTICE When using polypropylene common vent on Models 751 - 3501, a field supplied polypropylene to stainless steel adapter **MUST BE** installed between the backflow preventer and the unit connection.

Table 2D Flue Damper Kits

Flue Damper Kits		
Model	Damper Size	Kit Number
FB0751	6"	100056142
FB1001	6"	100056142
FB1251	8"	100141561
FB1501	8"	100141561
FB1751	8"	100141561
FB2001	8"	100141561
FB2501	9"	100141562
FB3001	10"	100141563
FB3501	10"	100141563
FB4001	12"	100141564
FB5001/6001	14"	100141565

PVC/CPVC (Models 751 - 4001 only)

This product has been approved for use with the PVC/CPVC vent materials listed in Table 2E on page 21.

NOTICE Factory installed vent connections are sized for stainless steel venting.

Installing vent and air piping

WARNING The vent connection to the appliance must be made with a minimum of 10 equivalent feet of CPVC pipe (field provided). 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 2E 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 boiler (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.

NOTICE CPVC vent or stainless steel pipe and vent fittings must be used in closet and alcove installations.

2 General venting *(continued)*

Table 2E PVC/CPVC Vent Pipe and Fittings

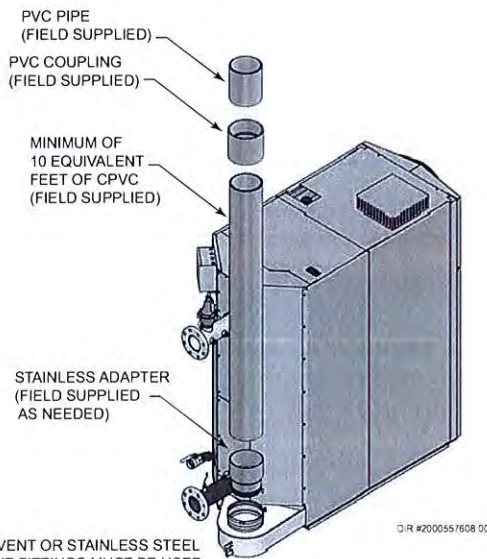
Approved PVC/CPVC Vent Pipe and Fittings		
Item	Material	Standard
Vent pipe	PVC Schedule 40, 80	ANSI/ASTM D1785
	PVC - DWV	ANSI/ASTM D2665
	CPVC Schedule 40, 80	ANSI/ASTM F441
Vent fittings	PVC Schedule 40	ANSI/ASTM D2466
	PVC Schedule 80	ANSI/ASTM D2467
	CPVC Schedule 80	ANSI/ASTM F439
	PVC - DWV	ANSI/ASTM 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.

1. Work from the boiler 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.)

Figure 2-2 Near Boiler PVC/CPVC Venting (Flue connections from the factory are sized for stainless steel venting.)



NOTE: CPVC VENT OR STAINLESS STEEL PIPE AND VENT FITTINGS MUST BE USED IN CLOSET AND ALCOVE INSTALLATIONS.

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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 2F PVC Adapter Kits

PVC Adapter Kits		
Model	Vent Size	Kit Number
751-1001	6"	100289537
1251	6"	100289537
1251	8"	100267012
1501	6"	100289537
1501	8"	100267012
1751-2001	8"	100267012
2501*	10"	100316610
3001	10"	100314852
3501	10"	100314852
4001	12"	Field Supplied

*Adapts 9" SS to 10" CPVC/PVC
NOTICE: A MINIMUM OF 10 EQUIVALENT FEET OF CPVC (FIELD SUPPLIED) MUST BE INSTALLED DIRECTLY AFTER ADAPTER IN ALL APPLICATIONS

2 General venting

Polypropylene (Models 751 - 4001 only)

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

NOTICE Factory installed vent connections are sized for stainless steel venting.

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 contact the manufacturer.

WARNING

Use only the adapters and vent system 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

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.

Table 2G 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

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 2G for approved vent adapters.

NOTICE All vent connections MUST be secured by the vent manufacturer's joint connector (FIG. 2-3).

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.

Figure 2-3 Near Boiler Polypropylene Venting

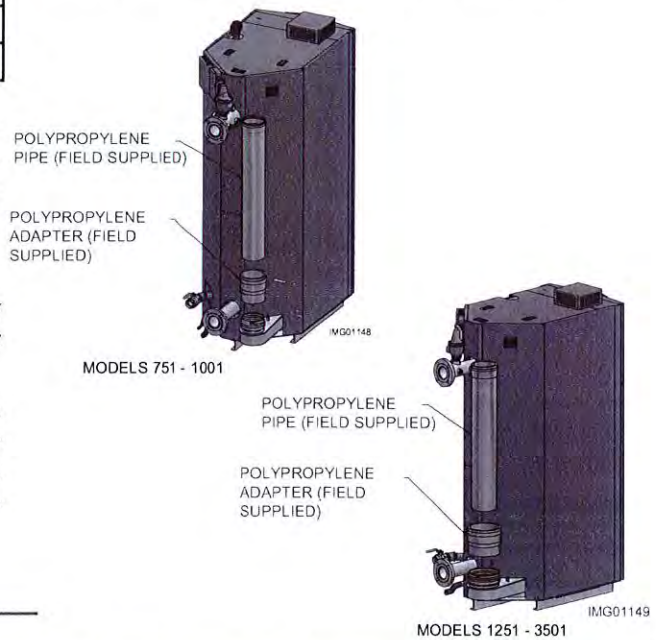


Table 2H Approved Polypropylene Terminations

Model	Manufacturer	Vent Model	Vent Type	Adapter Number	Joint Connector	Sidewall Kit*	Retaining Bracket / Adapter*
751-1001	Centrotherm Eco Systems	Innoflue	Single-Wall Flex	ISSA0606	--	--	IATP0606 / ISTAGL0606
	DuraVent (M & G)	PolyPro	Single-Wall Flex	FSA-06M-6PPF	--	6PPS-HLKL	--
1251-2001	Centrotherm Eco Systems	Innoflue	Single-Wall	ISSA0808	--	--	--
	DuraVent (M & G)	PolyPro	Single-Wall	FSA-08M-8PPF	--	8PPS-HSTL	--
2501	Centrotherm	Innoflue	Single-Wall	ISSA0910	--	--	--
3001-3501	Centrotherm Eco Systems	Innoflue	Single-Wall	ISSA1010	--	--	--
4001	Centrotherm	Innoflue	Single-Wall	ISSA1212	N/A	N/A	N/A
5001-6001	N/A	N/A	N/A	N/A	N/A	N/A	N/A

* These parts are only needed if the sidewall termination assembly is used (see FIG. 4-1C on page 26).

4 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.

WARNING Do not connect any other appliance to the vent pipe or multiple boilers to a common vent pipe except as noted in Section 2 on page 20. Failure to comply could result in severe personal injury, death, or substantial property damage.

CAUTION Sidewall venting commercial products will result in large exhaust plumes in cold climates. Consideration should be taken when locating in proximity to windows, doors, walkways, etc.

NOTICE Installation must comply with local requirements and with the National Fuel Gas Code, NFPA 54 / ANSI Z223.1 for U.S. installations or CSA B149.1 for Canadian installations.

Determine location

Locate the vent/air terminations using the following guidelines:

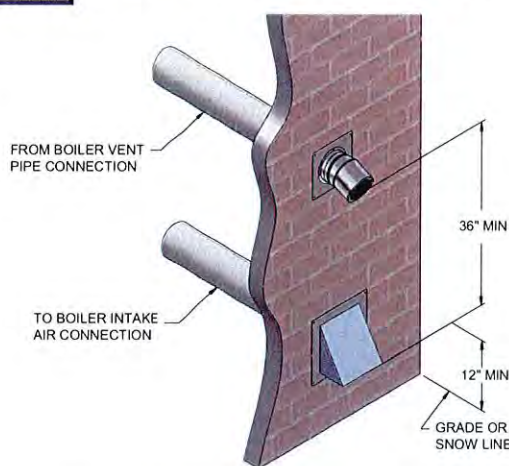
1. The total length of piping for vent or air must not exceed the limits given in the General Venting Section on page 18 of this manual.
2. You must consider the surroundings when terminating the vent and air:
 - a. Position the vent termination where vapors will not damage nearby shrubs, plants or air conditioning equipment or be objectionable.
 - b. The flue products will form a noticeable plume as they condense in cold air. Avoid areas where the plume could obstruct window views.
 - c. Prevailing winds could cause freezing of condensate and water/ice buildup where flue products impinge on building surfaces or plants.
 - d. Avoid possibility of accidental contact of flue products with people or pets.
 - e. 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.

- f. Do not terminate above any door or above or below any window. Condensate can freeze, causing ice formations.
- g. Locate or guard vent to prevent condensate damage to exterior finishes.
- h. Position the vent/air terminations on the same wall where wind blowing from any direction will not create a difference in pressure between the terminations.

Figure 4-1A Sidewall Termination of Air and Vent

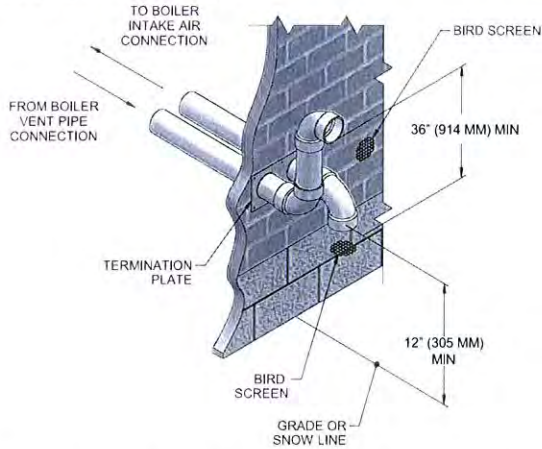
NOTICE PVC/CPVC or ABS is acceptable air inlet pipe material.



3. Maintain clearances as shown in FIG.'s 4-1A thru 4-4, pages 25 thru 27. The vent termination should not be located in traffic areas such as walkways, adjacent buildings, operable windows, or doors. Also maintain the following:
 - a. Vent must terminate:
 - At least 6 feet (1.8 m) from adjacent walls.
 - Not less than 7 feet (2.1 m) above grade where located adjacent to public walkways.
 - No closer than 12 inches (305 mm) below roof overhang.
 - At least 3 feet (.9 m) above any forced air intake within 10 feet (3 m).
 - No closer than 4 feet (1.2 m) horizontally from any door or window or any other gravity air inlet.
 - b. Air inlet must terminate at least 12 inches (305 m) above grade or snow line; at least 36 inches (914 mm) below the vent termination.
 - c. Do not terminate closer than 4 feet (1.2 m) horizontally from any electric meter, gas meter, regulator, relief valve, or other equipment. Never terminate above or below any of these within 4 feet (1.2 m) horizontally.
4. 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.

4 Sidewall direct venting Vent/air termination – sidewall

Figure 4-1B PVC/CPVC/ Polypropylene Sidewall Termination of Air and Vent w/Field Supplied Fittings (Models 751 - 3501 only)



3. The air piping must terminate in a down-turned elbow as shown in FIG. 4-1B. This arrangement avoids recirculation of flue products into the combustion air stream.
4. The vent piping must terminate in an elbow pointed outward or away from the air inlet, as shown in FIG. 4-1B.

WARNING Do not exceed the maximum lengths of the outside vent piping shown in FIG. 4-1C. Excessive length exposed to the outside could cause freezing of condensate in the vent pipe, resulting in potential boiler shutdown.

Figure 4-1C PVC/CPVC/Polypropylene Sidewall Termination of Air and Vent (Models 751 - 1001 only)

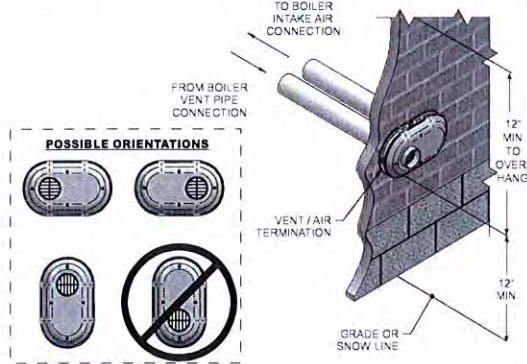


Table 4A Sidewall Vent Kits

Model	Kit #	Air	Vent	Centerline Width
751 - 1001	100157612	6" (152 mm)	6" (152 mm)	7 3/4" (197 mm)

Figure 4-2A PVC/CPVC/ Polypropylene Sidewall Termination w/Field Supplied Fittings (Models 751 - 3501 only)

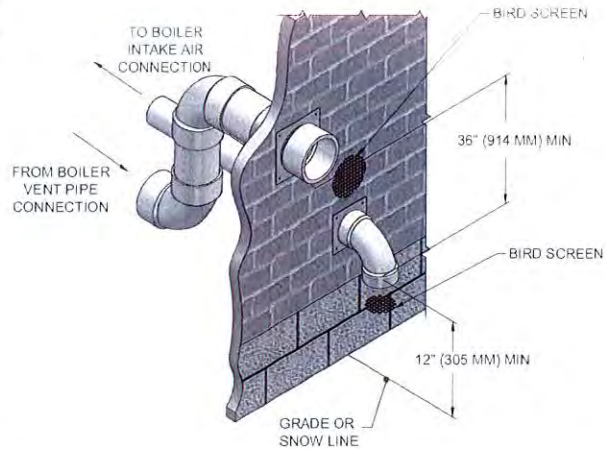
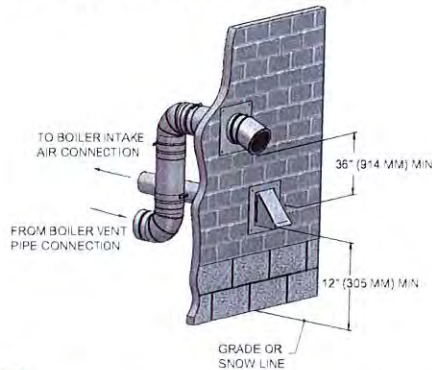


Figure 4-2B Stainless Steel Sidewall Termination w/Field Supplied Fittings (Models 751 - 6001 only)



NOTICE PVC/CPVC or ABS is acceptable air inlet pipe material.

5. Maintain clearances as shown in FIG.'s 4-1A thru 4-4, pages 25 thru 27. Also maintain the following:
 - a. Vent must terminate:
 - At least 6 feet (1.8 m) from adjacent walls.
 - No closer than 12 inches (305 mm) below roof overhang.
 - At least 7 feet (2.1 m) above any public walkway.
 - At least 3 feet (.9 m) above any forced air intake within 10 feet (3 m).
 - No closer than 4 feet (1.2 m) below or horizontally from any door or window or any other gravity air inlet.
 - b. Air inlet must terminate at least 12 inches (305 mm) above grade or snow line; at least 3 feet (.9 m) below the vent termination (FIG. 4-1B); and the vent pipe must not extend more than 24 inches (610 mm) vertically outside the building.
 - c. Do not terminate closer than 4 feet (1.2 m) horizontally from any electric meter, gas meter, regulator, relief valve, or other equipment. Never terminate above or below any of these within 4 feet (1.2 m) 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.

4 Sidewall direct venting *(continued)*

Vent/air termination – sidewall

Figure 4-3 Clearance to Doors and Windows

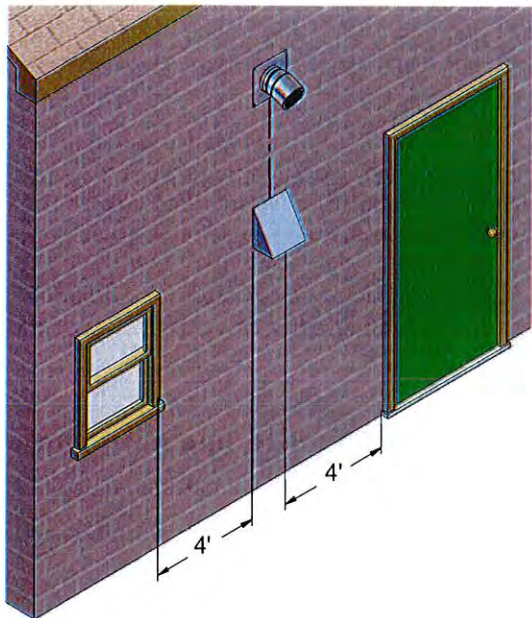
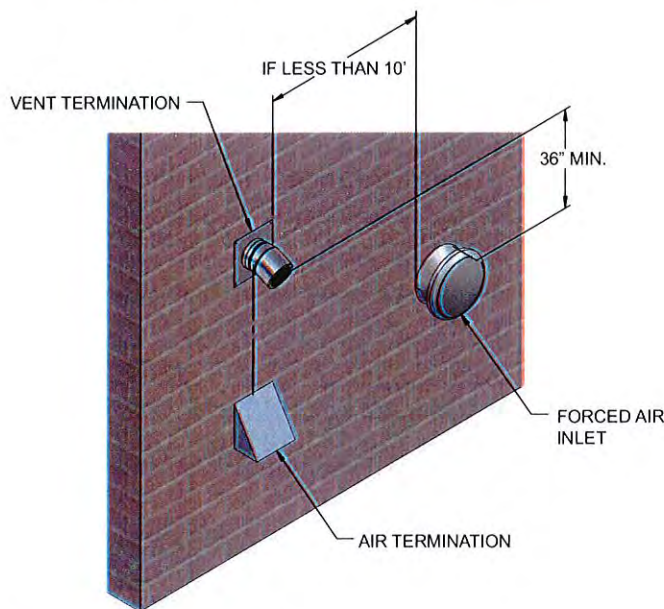


Figure 4-4 Clearance to Forced Air Inlets



CAUTION Sidewall venting commercial products will result in large exhaust plumes in cold climates. Consideration should be taken when locating in proximity to windows, doors, walkways, etc.

Prepare wall penetrations

1. Air pipe penetration:
 - a. Cut a hole for the air pipe. Size the air pipe hole as close as desired to the air pipe outside diameter.

Vent pipe penetration:

- a. Cut a hole for the vent pipe. For either combustible or noncombustible construction, size the vent pipe hole per the vent manufacturer's instructions.
2. Install the vent and air intake piping. Seal all gaps between the pipes and wall with RTV silicone sealant.
 3. Seal all wall cavities.

Termination and fittings

1. The air termination must be oriented at least 12 inches above grade or snow line as shown in FIG. 4-1A, page 25.
2. Maintain the required dimensions of the finished termination piping as shown in FIG. 4-1A, page 25.
3. Do not extend exposed vent pipe outside of the building more than what is shown in this document. Condensate could freeze and block vent pipe.
4. Stainless steel terminations are designed to penetrate walls with a thickness up to 9.25 inches of standard construction.

Multiple vent/air terminations

1. When terminating multiple Crest boilers terminate each vent/air connection as described in this manual (FIG. 4-5).

WARNING All vent pipes and air inlets must terminate at the same height to avoid possibility of severe personal injury, death, or substantial property damage.

4 Sidewall direct venting

- Place wall penetrations to obtain minimum clearance of 36 inches (914 mm) between vent pipe and adjacent air inlet, as shown in FIG. 4-5 for U.S. installations. For Canadian installations, provide clearances required by CSA B149.1 Installation Code.
- The air inlet of a Crest is part of a direct vent connection. It is not classified as a forced air intake with regard to spacing from adjacent boiler vents.

Figure 4-5 Multiple Vent Terminations (must also comply with Figure 4-1A)

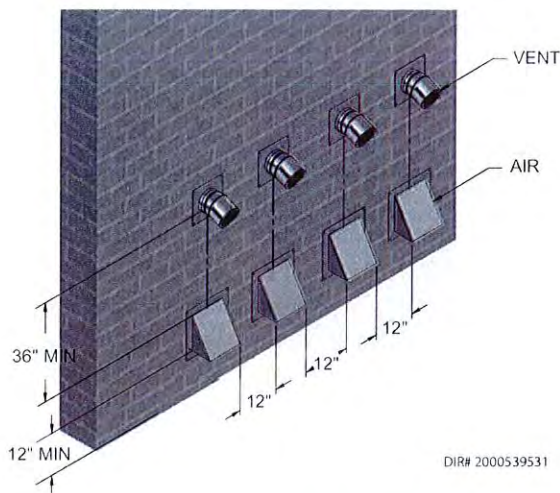


Figure 4-6 Direct Vent Terminations




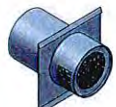



DIRECT VENT TERMINATIONS			
Air Inlet		Vent Termination	
Dryer Inlet		Straight	
90° Elbow		Mitered	
		23° Elbow	

Figure 4-7 Room Air (Direct Exhaust Terminations)

ROOM AIR (DIRECT EXHAUST TERMINATIONS)	
Vent Termination	
23° Elbow	
45° Elbow	

Room air

The Crest boiler may be installed with a single pipe carrying the flue products to the outside while using combustion air from the equipment room.

Follow the requirements in the General Venting, Sidewall Direct Venting, and Vertical Direct Venting sections for vent material specifications, vent length requirements, and vent termination requirements.

Install the air inlet cover (shipped loose with the boiler) per FIG. 4-8. Combustion and ventilation air must be supplied to the equipment room per the requirements on pages 12 and 13 of this manual for proper operation of the Crest boiler when utilizing the single pipe method.

Figure 4-8 Room Air Installation

