

## De Dietrich GT Series Boilers Venting Section Addendum

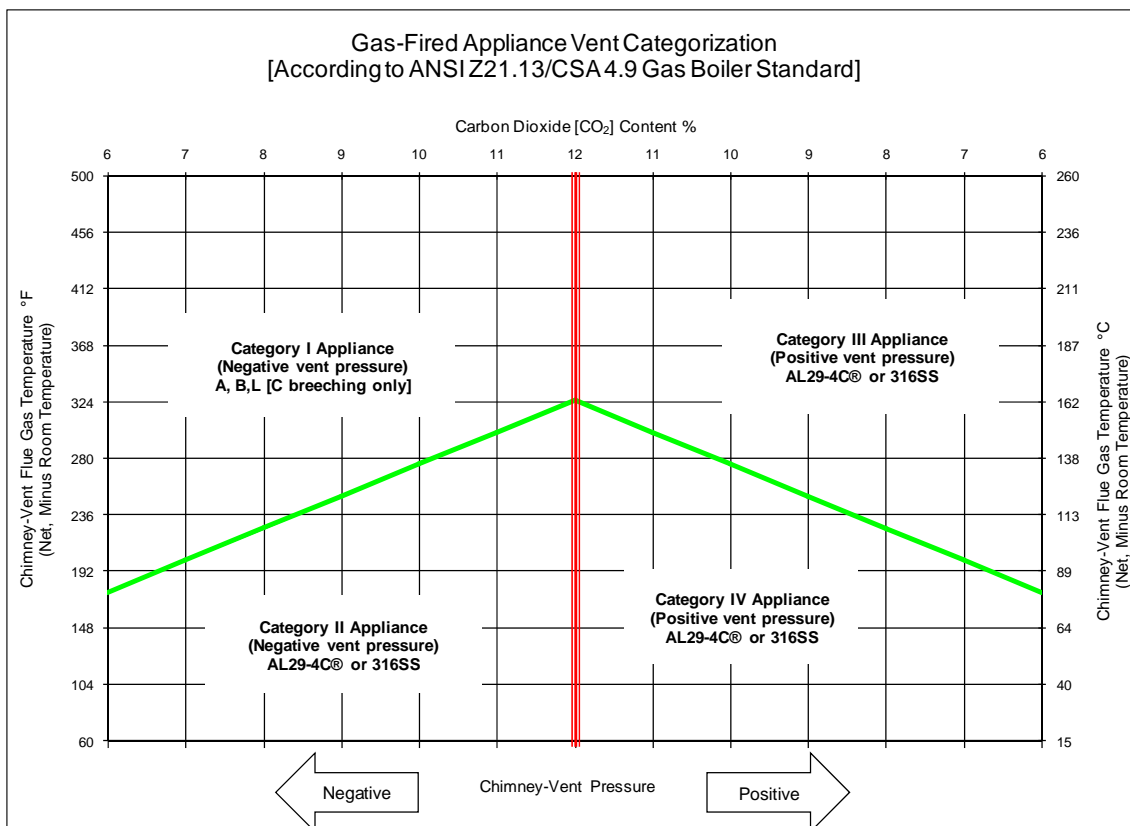
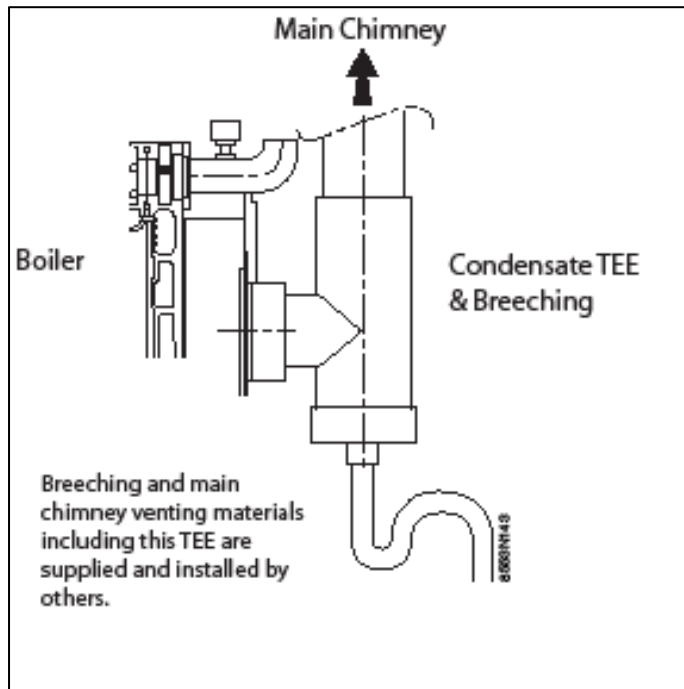
### Section 5: Boiler breaching and main chimney

De Dietrich GT Series boilers are a high performance boiler. The flue gas temperature can be less than 320°F [160°C]. Special attention is required for the venting of the boiler according to the specific site operating conditions.

**↓WARNING-CAUTION:**

The De Dietrich boiler can be operated at low flue gas temperatures. As a result flue gas condensation may occur and could accumulate in the breaching and main chimney. Suitable provision for flue gas condensation draining is required. A condensate TEE fitting shall be provided on the main chimney as close as possible to the boiler breaching collar (See fig 8553N143). Any horizontal portion of the breaching shall be kept to minimum.

A vent category chart has been provided to further assist the heating specialist to determine and evaluate whether the correct venting is applied for each gas vent category.



## Section 5.1 Breeching & Main Chimney Requirements:

### Gas Vent Category I - High Temperature Operation Applications:

Consult a chimney-venting specialist or professional engineer for the sizing of the breeching and main chimney in accordance to local and national gas codes CSA B149.1-05 & ANSI Z223.1 (NFPA 54) and sized accordingly to the appropriate tables or methods of chimney vent sizing as local jurisdiction will accept.

1. An approved type "B or L" vent may be used under these operating conditions.
  - a. Category I - Negative breeching pressure range from 0 to -0.09 inches water column [0 to 0.22 mbar]
  - b. Return water temperature is greater than 140°F [60°C]
  - c. The flue gas temperature is greater than 252°F [122°C] to a maximum of 473°F [245°C]
  - d. Double acting draft control device may be employed, but is not necessary for correct operation of the boiler. Consult a chimney-vent specialist for the correct usage and application.

**Application Note: If a barometric draft control is not used it is mandatory that a vent safety device, either equipped on burner or venting (gas, combustion head or vent pressure switch, WMO-1 vent safety switch or FTS-6 spill switch).**

### Gas Vent Category III - High Temperature Operation Applications:

The vent shall be sized by a chimney venting specialist or professional engineer using methods or vent calculations that are acceptable to National and local codes having jurisdiction.

2. Listed Industrial Type Factory Built Chimney system. Listed Type BH Class I/II 245C maximum, or special vent system fabricated from AL29-4C® or SS316L.
  - a. Category III – Positive breeching pressure range from 0 to +0.20 inches water column [0 to 0.50mbar]
  - b. The vent shall be sized by a chimney venting specialist or professional engineer using methods or vent calculations that are acceptable to National and local codes having jurisdiction. A maximum 16 ft. [5m] horizontal breeching length to the main chimney TEE fitting. The vent shall then extend vertically 5 ft. [1.5m] minimum to a 246 ft. [75m] maximum, through the ceiling roof.
  - c. Return water temperature is greater than 140°F [60°C]
  - d. The flue gas temperature is greater than 252°F [122°C] to a maximum of 473°F [245°C]
  - e. Do not use any barometric draft control on positive vent pressure systems as flue gas spillage will contaminate inside air quality.

**Application Note: it is mandatory that a vent safety device be employed, either equipped on burner or venting (gas, combustion head or vent pressure switch)**

### Oil or Dual Fuel Applications:

- a. Listed Industrial Type Factory Built Chimneys system or special vent system fabricated from AL29-4C® or SS316L sized in accordance to the appropriate table in the CSA B139-00 or NFPA 31.
- b. Negative breeching pressure range from 0 to -0.09 inches water column [0 to 0.22 mbar]
- c. A single acting draft control device may be employed as required, but is not necessary for correct operation of the boiler. Consult a chimney-vent specialist for the correct usage and application.

**Application Note: If a barometric draft control is not used it is mandatory that a vent safety device, either equipped on burner or venting (gas, combustion head or vent pressure switch, WMO-1 vent safety switch or FTS-6 spill switch).**

### Gas Vent Category II, III & IV - Low Temperature Operation Applications:

These vent systems shall be sized by a chimney venting specialist or professional engineer using methods or vent calculations that are acceptable to National and local codes having jurisdiction Listed Industrial Type Factory Built Chimney system.

1. Listed Type BH Class I/II 245C maximum, or special vent system fabricated from AL29-4C® or SS316L.
2. The vent shall then extend vertically 5 ft. [1.5m] minimum to a 246 ft. [75m] maximum, through the ceiling roof.
3. Condensate drain TEE fitting shall be provided on the boiler breeching as close a practical to avoid any accumulation of flue gas condensation
4. Follow the vent manufacturers recommended and supplied instructions regarding, vent connection cleaning, sealing, supporting.
5. Category II - Negative breeching pressure range from 0 to -0.09 inches water column [0 to 0.22mbar]
6. Category III & IV – Positive breeching pressure range from 0 to +0.20 inches water column [0 to 0.50mbar]
7. Do-not use a barometric draft control on positive vent pressure systems as flue gas spillage will contaminate the inside air quality.

**Application Note: it is mandatory that a vent safety device be employed, either equipped on burner or venting (gas, combustion head or vent pressure switch)**

#### ↓ **APPLICATION NOTE: (Other than Sidewall or Direct Vent, sealed combustion air applications)**

All venting systems must be sized by experienced venting specialists using available codes or by acceptable engineering methods, a final sizing sheet of the venting and calculation must show how the venting was sized and designed. A final approval by local authorities is advised. The calculation sheet shall be secured and a copy provided on site.

#### ↓ **WARNING-CAUTION: (General Venting)**

- For low temperature operating applications, it is recommended to use vent types 'BH' (AL29-4C®) or SS316L, provided the venting is listed to ULCS636-1995 or UL 1738 or as stipulated in CSA B149.1-05 or ANSI Z223.1/NFPA 54 Type 'BH' Class I/II-245C maximum. Consult a qualified venting supplier/specialist for assistance in sizing and selections of suitable venting.
- Do not puncture or drill holes in the chimney or venting unless as described by the venting manufacturer printed instructions.
- The chimney must be finished with a rain cap or finishing cone and must provide suitable protection against rain, downdrafts, birds and rodents.
- Pipe the condensate drain separately to a floor drain or condensate pump/sump.
- Use only materials that are designed and acceptable for use with condensate for the condensate piping.
- Each condensate drain must contain an (P-Trap) anti-siphon/pigtail to prevent the flue gas flow through the condensate piping.
- Consult local authorities and national codes regarding the disposal of flue gas condensate into public waste water system.
- Flue gas condensate is very aggressive and corrosive, which could lead to failure of the venting system or drains.
- Do not install any fittings in the condensation lines.
- The flue gas condensation may require a neutralization system before entering the drain. Consult a chemical treatment company for neutralizer system.
- If a flue gas condensation neutralization system has been installed, a posted routine inspection schedule shall be posted for periodic monitoring and cleaning of the condensate collection and disposal system. Routine inspections shall determine that there is no blockage in the condensate fittings or lines and that the condensate flows freely on a daily basis. Condensation neutralization materials requires replenishing, the PH level shall be maintained around 7 (neutral). Consult a water chemical specialist for application and maintenance assistance.
- Any horizontal portions of the breeching or main chimney must be sloped upwards ¼" per linear foot [21mm/m] from the boiler to the vent terminal.
- The boiler requires a vent system that will produce sufficient draft at all times to ensure safe and correct operation of the boiler. The vent system must exhaust all flue gases to the outside in a safe and effective manner.
- An improperly sealed venting system could result in carbon monoxide (CO) poisoning. Ensure adequate support and fastening of the vent system, according to the vent manufacturers recommended or supplied instructions for proper support, fastening and sealing requirements.
- Co-venting with other appliance shall conform to NFPA 54/ANSI Z223 or CSA B149.1-05 gas installation code and sized in accordance to the appropriate table in Annex C. as applicable. Any unused opening must be sealed.
- Any improper operation of the venting system shall be corrected.
- Operating the De Dietrich GT Series boiler at low return/supply temperatures will cause a reduction of the flue gas temperature, creating excessive wet-vent periods or flue gas temperatures nearing the dew point temperature. In these applications the venting material must be able to resist corrosion of flue gas condensation.

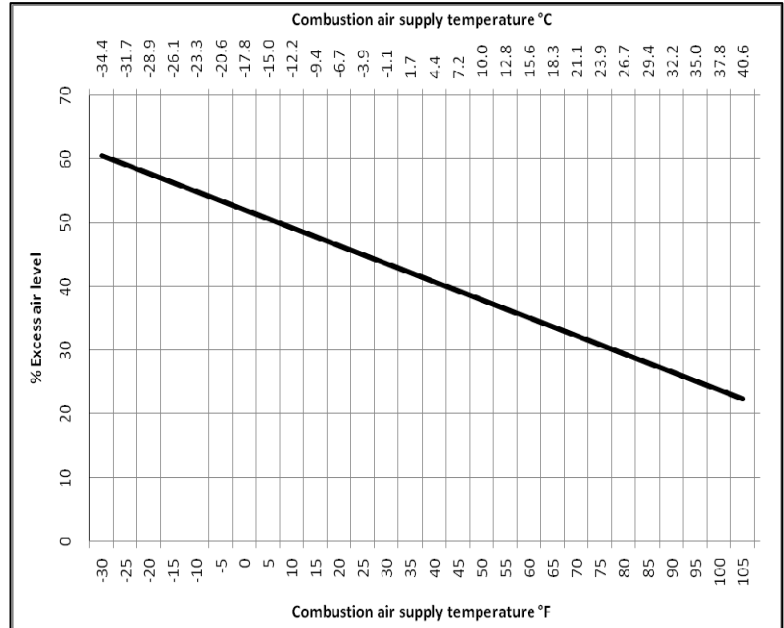
## Section 5.2 – Direct Vent (Ducted Combustion Air)

### Air intake vent materials

1. Rigid rectangle or round vent pipe of aluminum or galvanized sheet metal construction that meets CAN/ULC S-110 or UL 181 Class 1 approved type.

↓ These applications require special attention to the seasonal operating conditions, as influence of the combustion air temperature will adversely affect the boiler emissions. High levels of CO can be produced if the excess air is reduced and could cause an unsafe operating condition that may cause personal injury including loss of life or damage to the equipment.

Using the graph, determine the minimum and maximum outside combustion air temperature the boiler would operate with, using the correction factor to determine what excess air level the boiler would safely operate with during the entire heating season. Also the level or pressure of which the air is drawn from limits the maximum vent length.



### Operating excess air guideline:

1. Record combustion air temperature, calculate excess air %. Using these two pieces of information determine your maximum and minimum air combustion temperature range.
2. Use the chart to determine if the excess air level will be less than 20% @ maximum combustion air temperature, if so more excess will be needed.

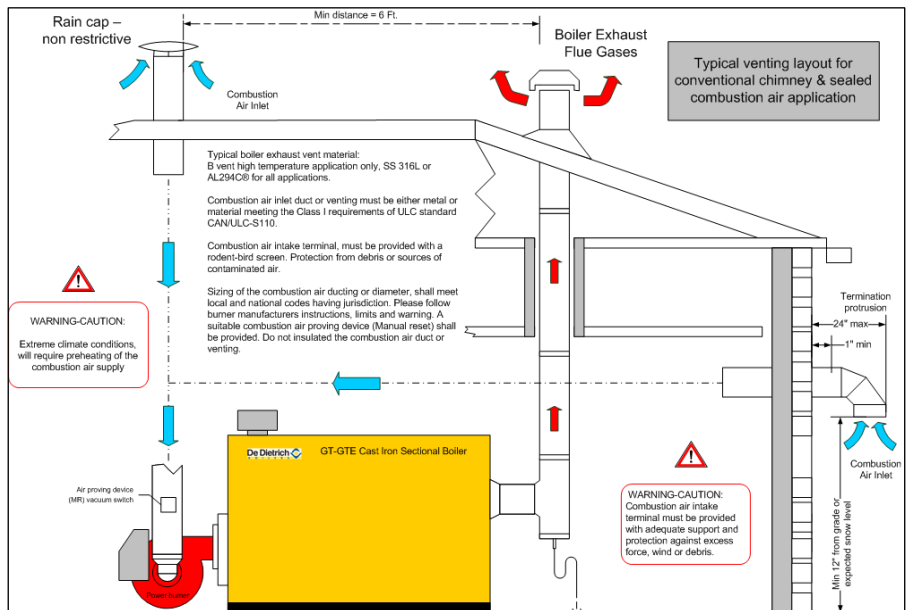
**Note:** Although the graph illustrates excess air with the changes of the combustion air temperature, the graph shall be used only as guide and does not indicate how each application will react. It is the sole responsibility of the installing contractor to ensure and confirm if the boiler/burner combination will perform safely in each extreme condition.

### Combustion air venting requirements:

1. Combustion air preheating as necessary
2. Aluminum, stainless steel or galvanized rigid round vent or square duct.
3. Burner equipped with a combustion air supply proving device (manual reset)
4. Minimum vent diameter size per table 1
5. Less than maximum vent length per table 1
6. Air inlet terminal side wall application must be either a 90° elbow or TEE w/ bird rodent protective screen.
7. For vertical application or non restrictive rain cap fitting with a bird/rodent protective screen.



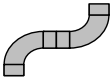
### ↓ WARNING:

- Do not use, plastic, PVC, or flexible venting materials.
- The intake air terminal must be protected against wind, rain, and debris and snow accumulation. A bird and rodent screen must be provided on the vent terminal. The screen opening must not be less than 1/4"



**Section 5.2.1 - Table 1**  
**Direct Vent (ducted combustion air) supply – sizing table.**

Table 1 Direct Vent (Ducted Combustion Air) Sizing Chart

Boiler Model	Fuel Input (Gas) MBH	Fuel Input (Oil) GPH	Round Duct ø	Eq. Length 90° Elbow 	Eq. Length 45° Elbow 	Eq. Length 180° Offset 	Max Equivalent length
<b>GT 120A Series (formerly GT110A)</b>							
GT123A	94	0.65	3 In. [75mm]	10 Ft. [3m]	5 Ft. [1.5m]	30 Ft. [9.1m]	150 ft. [46m]
GT124A	115	0.80					
GT125A	144	1.00					
GT126A	166	1.15					
<b>GT 220A Series (Formerly 210A)</b>							
GT224A (GT214A)	173	1.20	4 In. [100mm]	10 Ft. [3m]	5 Ft. [1.5m]	30 Ft. [9.1m]	150 ft. [46m]
GT225A (GT215A)	224	1.55					
GT226A (GT216A)	274	1.90					
GT227A (GT217A)	324	2.25					
GT228A (GT218A)	361	2.50					
<b>GT330A (Formerly GT300A/II)</b>							
GT334A (GT304A/II)	404	2.80	5 In. [125mm]	10 Ft. [3m]	5 Ft. [1.5m]	30 Ft. [9.1m]	150 ft. [46m]
GT335A (GT305A/II)	598	4.15					
GT336A (GT306A/II)	808	5.60	6 In. [150mm]				
GT337A (GT307A/II)	1,024	7.10					
GT338A (GT308A/II)	1,226	8.50	7 In. [180mm]				
GT339A (GT309A/II)	1,442	10.00					
<b>GT430A Series (Formerly GT400A)</b>							
GT430-8A (GT408A)	1,730	12.00	8 In. [200mm]	10 Ft. [3m]	5 Ft. [1.5m]	30 Ft. [9.1m]	150 ft. [46m]
GT430-9A (GT409A)	1,947	13.50					
GT430-10A (GT410A)	2,278	15.80	10 In. [250mm]				
GT430-11A (GT411A)	2,567	17.80					
GT430-12A (GT412A)	2,826	19.60					
GT430-13A (GT413A)	3,100	21.50					
GT430-14A (GT414A)	3,389	23.50					
<b>GT530A Series (Formerly GTE500A)</b>							
GT530-15A (GTE515A)	3,749	26.00	10 [250mm]	10 Ft. [3m]	5 Ft. [1.5m]	30 Ft. [9.1m]	150 ft. [46m]
GT530-16A (GTE516A)	3,966	27.50					
GT530-17A (GTE517A)	4,254	29.50	12 [300mm]				
GT530-18A (GTE518A)	4,470	31.00					
GT530-19A (GTE519A)	4,759	33.00					
GT530-20A (GTE520A)	4,975	34.50					
GT530-21A (GTE521A)	5,191	36.00					
GT530-22A (GTE522A)	5,480	38.00					
GT530-23A (GTE523A)	5,696	39.50					
GT530-24A (GTE524A)	5,984	41.50					
GT530-25A (GTE525A)	6,201	43.00					

### 5.3 Side-wall Vent Applications (Gas fired boilers only):

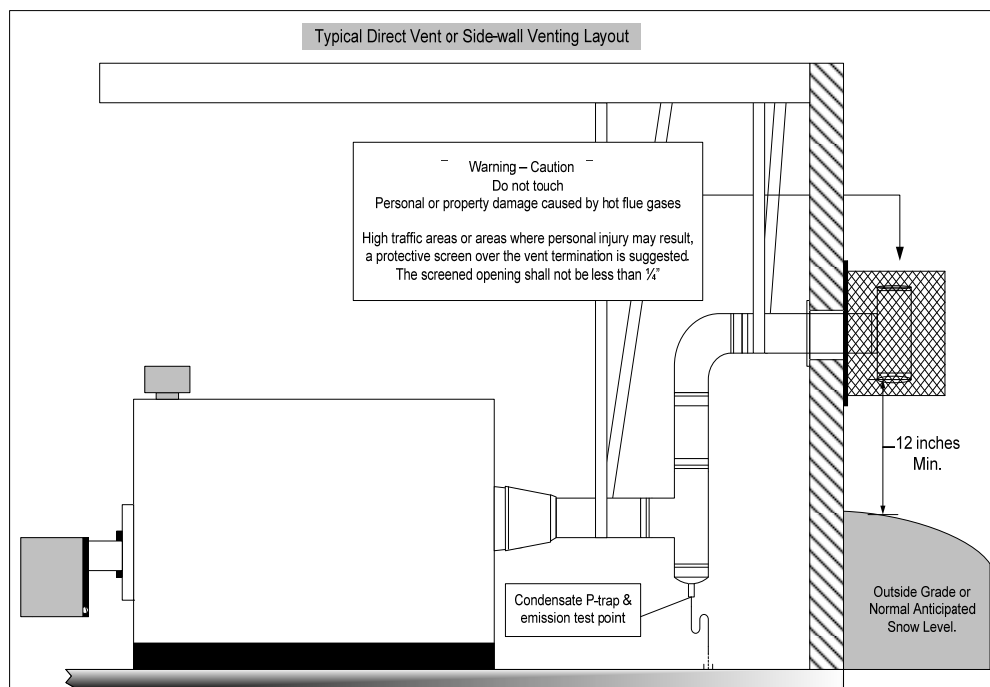
↓These systems do not fall under any of the gas vent categories, these systems are pre-engineered. The applications of these venting systems must be followed exactly for safe, efficient and trouble free operation.

#### ↓WARNING & CAUTION:

Improperly sealed venting systems could result in carbon monoxide [CO] poisoning; ensure adequate support and fastening of system. Ensure venting can safely exhaust all flue gases outside in an effective manner. These systems must operate under a positive vent pressure condition that is stable. Do not puncture or drill holes in any portion of the venting. The venting to be sealed according to the vent manufacturers recommended method.

#### System Requirements:

1. Venting diameter (depending upon model) can be reduced up to 2 nominal vent pipe sizes only at the boiler vent collar.
  2. Use vent Type "BH" [AL294C®] material only
  3. Condensate TEE fitting supplied on the boiler breeching as close as possible and be orientated to avoid accumulation of flue gas condensation in the boiler or venting is also used for determining flue gas emissions.
  4. Vent termination TEE
  5. Vent safety device, equipped on burner or venting, must be a manual reset type. The device shall be accurately calibrated on site to disconnect the fuel supply or power to the burner in the event of partial blockage of the venting system or if the vent pressure exceeds 0.20 inches water column [0.50 mbar]
- All venting must be calculated to equivalent lengths and be between 5 ft. [1.5m] Minimum & 30 ft. [9m] maximum.
  - Equivalent vent lengths; 90°Elbow = 10 ft [3m] & 45° elbow = 5 ft.[1.5m]
  - Vent [breeching] pressure shall not exceed 0.20 inches water column [0.50 mbar] positive vent pressure.
  - Vent termination must be an offset TEE type, follow vent terminal location and installation precautions. Do not include the termination TEE length in the vent length calculation.
  - The boiler vent collar condensate TEE is an extension of the boiler venting collar and is not included in the vent length calculation.
  - Venting to be sloped at least ¼" per linear foot [6mm per 30cm] away from the boiler to avoid any accumulation of condensation in the venting or boiler.
  - Optional function of power burners which can employ a post purge function to exhaust flue gases after heat demand has been satisfied, consult burner manufacture for information.
  - Burner employing a standby air damper closed position, the closed position should be slightly opened to allow hot flue gases to escape upward through venting and not be entrapped within the burner assembly.
  - Any vent riser portions of the vent system is not included in the overall equivalent lengths, unless the rise height exceeds 10 ft.
  - The vent diameter  $\varnothing$  can be reduced only at the boiler vent collar, up to 2 nominal pipe diameters.



## 5.4 All Side-wall and direct Vent termination locations installation precautions:

### ↓WARNING/CAUTION:

In all cases avoid potential vent termination locations where excess debris or snow could accumulate and block the vent termination to any degree. The venting and terminations require routine inspection and maintenance, appropriate clearances shall be provided.

- Minimum clearance of 4 ft. [1.22m] horizontally from, and in no case above or below, unless a 4 foot [1.22m] horizontal distance is maintained, from electric meters, gas meters, regulators & relief equipment.
- Do Not Co-Vent Any Sidewall Venting System

It is strongly suggested, prior to initiating these installations, a consultation with the local authorities have jurisdiction be consulted to review the installation and areas of concern.

**According to Gas Installation Code NFPA 54 /ANSI Z223.1 A – Oil Installation Code NFPA 31 – US Installation  
According to Gas Installation Code CSA B149.1 & Oil Installation Code CSA B139**

### A vent shall not terminate...

- ... Less than 3 ft. of any combustion air inlet source located within 10 ft.
- ... Less than 6 ft. around of any combustion air inlet to any building
- ... Less than 6 ft. from any combustion air inlet
- ... Less than 1 ft. from any obstruction
- ... Directly above a paved sidewalk or driveway that service 2 buildings
- ... Less than 1 ft. above grade or normal anticipated snow level for the area
- ... Underneath a veranda, deck or porch unless:
  - a) The veranda, deck or porch is fully open on a minimum of 2 sides
  - b) The distance between the top of the vent terminal and underside of the veranda, deck or porch is greater than 1 ft.
- ... Over public walkway, driveways or other area where condensate or vapor could create nuisance or hazard or could be detrimental to the operation of regulators, reliefs, valves or other equipment.
- ... Less than 7 ft below any paved sidewalk or driveway
- ... Less than 4 ft. above a meter/regulator assembly (horizontal) of the vertical center line of the regulator vent outlet to a maximum vertical distance of 15 ft.
- ... Less than 5 ft. from vent outlet of the supply tank
- ... Less than 1 ft. from the roof or soffit
- ... Less than 6 ft. from any window, door or mechanical or non mechanical combustion air supply to any building.
- ... Less than 4 ft. from an oil tank vent or oil tank fill inlet
- ... Within 6 ft. of any property line
- ... Less than 3 ft. from any building corner or L shape in the building structure
- ... Where flue gases may be directed towards the building exterior causing damage

### ↓WARNING-CAUTION:

Consult Local Codes & Authorities for other Requirements not mentioned or addendums

