

Features of the *National Fuel Gas Code Handbook*, 2018 Edition

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Chapter 12 • Venting of Appliances

12.9.2 A mechanical draft venting system of other than direct vent type shall terminate at least 4 ft (1.2 m) below, 4 ft (1.2 m) horizontally from, or 1 ft (300 mm) above any door, operable window, or gravity air inlet into any building. The bottom of the vent terminal shall be located at least 12 in. (300 mm) above finished ground level.

FAQ Do the separation requirements of 12.9.2 for exit terminals apply to windows that do not open?

Note that the requirement refers to operable windows — it is clear that the distances in the requirement are not applicable to windows that cannot be opened.


Subsections 12.9.1 and 12.9.2 are concerned with preventing appliance combustion products from being drawn into a building through fresh air inlets, including operable windows.

12.9.3 The clearances for through-the-wall direct vent terminals shall be in accordance with Table 12.9.3. The bottom of the vent terminal and the air intake shall be located not less than 12 in. (300 mm) above finished ground level.

TABLE 12.9.3 Through-the-Wall Direct Vent Termination Clearances.

Direct Vent Appliance Input Rating:	Through the Wall Vent Terminal Clearance from any Air Opening into a Building:
10,000 Btu/hr (3kW) and less	6 in. (150 mm)
Greater than 10,000 Btu/hr (3kW) and not exceeding 50,000 Btu/h (14.7kW)	9 in. (230 mm)
Greater than 50,000 Btu/hr (14.7kW) and not exceeding 150,000 Btu/h (29.4kW)	12 in. (300 mm)
> 150,000 Btu/hr (29.4kW)	In accordance with the appliance manufacturer's instructions and in no case less than the clearances specified in 12.9.2

EXHIBIT 12.17



Outside termination of direct-

Table 12.9.3 was originally developed for residential-type appliances installed in dwellings. These direct vent appliances had relatively low Btu (kW) inputs limited in accordance with their product standards. Previous code editions specified a minimum of 12 in. (300 mm) clearance for an appliance with an input above 50,000 Btu/hr (14.7 kW).

Direct vent appliances with much higher Btu (kW) input, such as commercial boilers and water heaters, are available and have become more commonplace. Direct vent boilers with inputs in the hundreds and even millions of Btu/hr are available. **Table 12.9.3** was revised for the 2018 edition to address high input commercial and residential appliances. The minimum clearance for appliances with an input above 150,000 Btu/hr (29.4 kW) is the same required for sidewall mechanical draft appliances (see 12.9.2), unless the appliance manufacturer requires greater clearances.

FAQ Why are vent terminals for direct-vent appliances allowed to be closer to building openings than exit terminals for other types of appliances?

See **Exhibit 12.17** for an example of correct vent termination placement. Vent gases from direct-vent appliances disperse rapidly upon leaving the vent terminal, even when the terminal is located under an open window. However, a window is unlikely to be open when heat is needed. **Subsection 12.9.3** also specifies the location of the exit terminal of direct-vent appliances.

T-2

NFPA 54 Summary of Technical Changes: 2018

2018 Section	Comments	FR/SR Reference
5.6.2.2	Revised to change the minimum pipe size from schedule 40 to schedule 10. Previously, the schedule 40 restriction was in place to safely accommodate threading of pipe. Allowing schedule 10 acknowledges different pipe joining methods. Revised to clarify that the pipe needs to comply with dimensional specifications as well as chemical composition and manufacturing specifications. Added standard specification for stainless steel.	FR 13, SR 20, SR 30
5.6.3.1	Revised to remove the list of metallic tubing types and to clarify that it applies to all metallic tubing and not just the types previously listed.	FR 97
5.6.3.3	Added standard specifications for stainless steel tubing to align with the allowed usage of stainless steel tubing products.	FR 14
5.6.4.1.2	Revised to reflect the standard specification document, ASTM F2945, which covers polyamide pipe, tubing, and fittings.	SR 29
5.6.7.1	Revised to allow press connected joints and to specify joining methods for pipe lighter than schedule 40, since schedule 10 pipe is now permitted.	FR 20, SR 21
5.6.7.2	Revised to specifically apply to copper tubing, as stainless steel tubing has been added as a separate section.	FR 15
5.6.7.3	Added to recognize the use of stainless steel tubing products.	FR 16
5.6.7.5	Revised to include stainless steel as a pipe material.	FR 17
5.8.1, 5.8.2	Revised to remove "gas appliance pressure regulator" because appliance regulators do not fall under the scope of the code, and to add a 2 psi threshold.	FR 21, SR 7

Summary of Technical Changes section provides an overview of major code changes to the 2018 edition.



Flip to the inside back cover for the
National Fuel Gas Code **Structure At-a-Glance**

Sample calculation worksheets
are provided throughout the
handbook.

Blank versions of these worksheets
are provided in **Supplement 3**.

WORKSHEET 53.3

CALCULATION WORKSHEET: COMBUSTION AIR, STANDARD METHOD

Step 1: • Calculate the room volume.

Room volume: Room length: _____
Room width: _____
Room height: _____
Room volume: = Length × width × height
= _____

Table 1 Appliances Table

Appliance	Input rating (Btu/hr)
Furnace	
Water heater	
Space heater	
Range	
Other	
Total	
Total/1000	

Required volume:

Additional air needed? (Check one) Yes ☐ No ☐

CALCULATION METHOD

Room volume = _____ (from Step 1 above)

Maximum
appliance input: = Room volume × 20
= _____ × 20
= _____

Total appliance
input: = _____

Additional air needed? (Check one) Yes ☐ No ☐

Prepared by: _____ Date: _____

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WORKSHEET 9.1

CALCULATION WORKSHEET: COMBUSTION AIR, STANDARD METHOD

Step 1: • Calculate the room volume.

Room volume: Room length: 38 ft
Room width: 28 ft
Room height: 8 ft
Room volume: = Length × width × height
= 8512 ft³

Step 2: • Calculate the total input of all appliances in the room.
• Enter the input rating of all appliances in Table 1. (Per 9.3.1.1, Exception 2, dryers are not included.)
• Total the column.
• Divide the total by 1000 (of Btu/hr).

Table 1 Appliances Table

Appliance	Input rating (Btu/hr)
Furnace	<u>100,000</u>
Water heater	<u>45,000</u>
Space heater	
Range	
Other	
Total	<u>145,000</u>
Total/1000	<u>145</u>

Step 3: • Calculate the required volume. Divide room volume (Step 1) by total/1000 (Step 2).
• If less than 50, additional air is needed.
• If greater than or equal to 50, no additional air is needed.

Required volume: = 8512 ft³
= 145
= 58.7
Additional air needed? (Check one) Yes ☐ No ☒

ALTERNATE CALCULATION METHOD

Step 1: • Calculate the room volume.

Room volume = 8512 ft³ (from Step 1 above)

Step 2: • Calculate the maximum appliance input.

Maximum
appliance input: = Room volume × 20
= 8512 × 20
= 170,240 Btu/hr

Step 3: • Determine if additional air is needed.
• If less than max., no additional air is needed.
• If greater than or equal to max., additional air is needed.

Total appliance
input: = 145,000 Btu/hr
Additional air needed? (Check one) Yes ☐ No ☒

Job: 25 Main Street Prepared by: TL Date: 1/1/18

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Sample calculation for determining combustion air using the standard method.



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worksheets are also available as
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National Fuel Gas Code Handbook

TENTH EDITION

Edited by

Laura E. Moreno
NFPA

With the complete text of the 2018 edition of NFPA® 54, *National Fuel Gas Code*



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