

# 2009 IRC Q&A: Plumbing, Mechanical and Fuel Gas Provisions

**G2407.6 (304.6) Outdoor combustion air.** Outdoor combustion air shall be provided through opening(s) to the outdoors in accordance with Section G2407.6.1 or G2407.6.2. The minimum dimension of air openings shall be not less than 3 inches.

**G2407.6.1 (304.6.1) Two-permanent-openings method.**

Two permanent openings, one commencing within 12 inches of the top and one commencing within 12 inches of the bottom of the enclosure, shall be provided. The openings shall communicate directly, or by ducts, with the outdoors or spaces that freely communicate with the outdoors.

Where directly communicating with the outdoors, or where communicating with the outdoors through vertical ducts, each opening shall have a minimum free area of 1 square inch per 4,000 Btu/h of total input rating of all appliances in the enclosure [see Figures G2407.6.1(1) and G2407.6.1(2)].

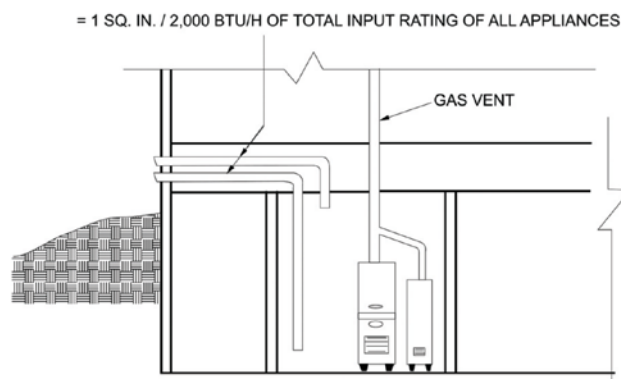
Where communicating with the outdoors through horizontal ducts, each opening shall have a minimum free area of not less than 1 square inch per 2,000 Btu/h of total input rating of all appliances in the enclosure [see Figure G2407.6.1(3)].

**Q:** How do I determine whether a pipe serving a combustion air system is horizontal or vertical for calculating the appropriate size of outdoor combustion air ducts? For example, if the horizontal duct enters the building through the wall or rim joist but elbows down and continues vertically to the appliance enclosure, what is the proper method for sizing the ducts?

**A:** Section G2407.6.1 prescribes the method for providing outdoor combustion air through two

openings—one high and one low—within the space containing the appliances. In this section, the code considers that greater air movement occurs with either a direct connection or a vertical connection to the outdoor air when compared to combustion air provided through horizontal ducts. For this reason, horizontal ducts require an opening with twice the free area of vertical ducts serving the same appliances. For the installation in your example using the prescriptive provisions of this section, the more conservative rate of 1 square inch per 2,000 Btu/h input rating is appropriate and provides adequate combustion air. In other words, if any portion of the combustion air duct is horizontal, the entire duct must be treated as a horizontal duct. The code provides no prescriptive method to account for ducts that have both vertical and horizontal components.

Of course, an engineered design in accordance with Section G2407.8 is an alternative and may result in combustion air ducts with smaller openings. See Figure 24-8. [24-8]



**HORIZONTAL DUCTS FOR COMBUSTION AIR  
FIGURE 24-8**