

Combustion Air

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Indoor Combustion Air

The total required volume shall be the sum of the required volume calculated for all appliances located within the space.

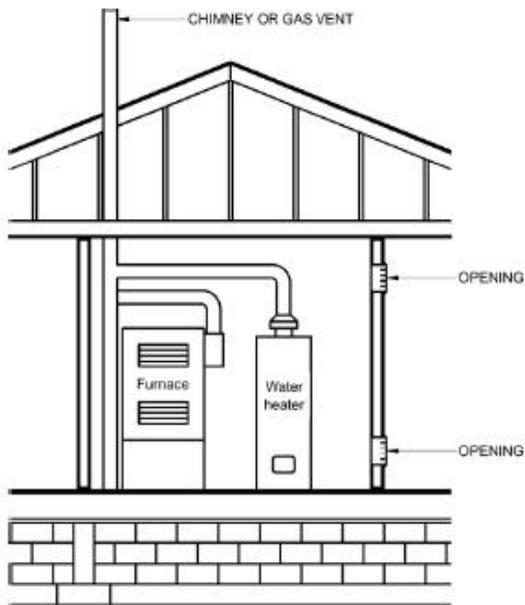
Rooms communicating directly with the space in which the appliances are installed through combustion air openings are considered to be part of the required volume.

The minimum required volume shall be 50 cubic feet per 1,000 Btu/h of the appliance input rating. ((Total BTU Input of all Appliances / 1,000) x 50 = Volume Required)

1.1 Combining spaces on the same story

Louvers and Grilles

The required size of openings for combustion, ventilation and dilution air shall be based on the net free area of each opening. Where the free area through a design of louver, grille or screen is known, it shall be used in calculating the size opening required to provide the free area specified. Where the design and free area of louvers and grilles are not known, it shall be assumed that wood louvers will have 25% free area and metal louvers and grilles will have 75% free area. Screens shall have a mesh size not smaller than. Non-motorized louvers and grilles shall be fixed in the open position. Motorized louvers shall be interlocked with the appliance so that they are proven to be in the full open position prior to main burner ignition and during main burner operation. Means shall be provided to prevent the main burner from igniting if the louvers fail to open during burner start-up and to shut down the main burner if the louvers close during operation.



Each opening shall have a minimum free area of 1 square inch per 1,000 Btu/h of the total input rating of all appliances in the space, but not less than 100 square inches. (Total BTU Input of all Appliances / 1,000 = Free Area Of Each Opening Required)

One opening shall commence within 12 inches of the top and one opening shall commence within 12 inches of the bottom of the enclosure.

The minimum dimension of air openings shall be not less than 3 inches.

For example: You cannot have an opening 2 inches x 50 inches which is not less than 100 square inches because the minimum dimension (2 inches) is less than 3 inches.

1.2 Combining spaces in different stories

The volumes of spaces in different stories shall be considered as communicating spaces where such spaces are connected by one or more openings in doors or floors having a total minimum free area of 2 square inches per 1,000 Btu/h of total input rating of all appliances. (Total BTU Input of all Appliances / 1,000 x 2 = Total Free Area Required)

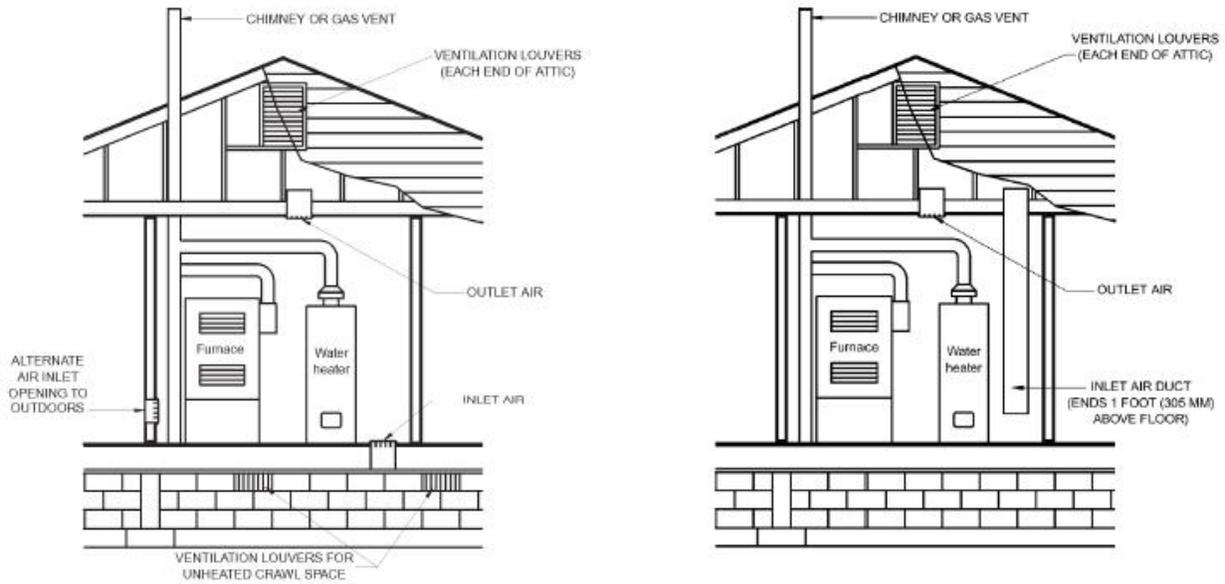
Outdoor Combustion Air

Outdoor combustion air shall be provided through opening(s) to the outdoors. The minimum dimension of air openings shall be not less than 3 inches.

2.1 Two-permanent-openings method

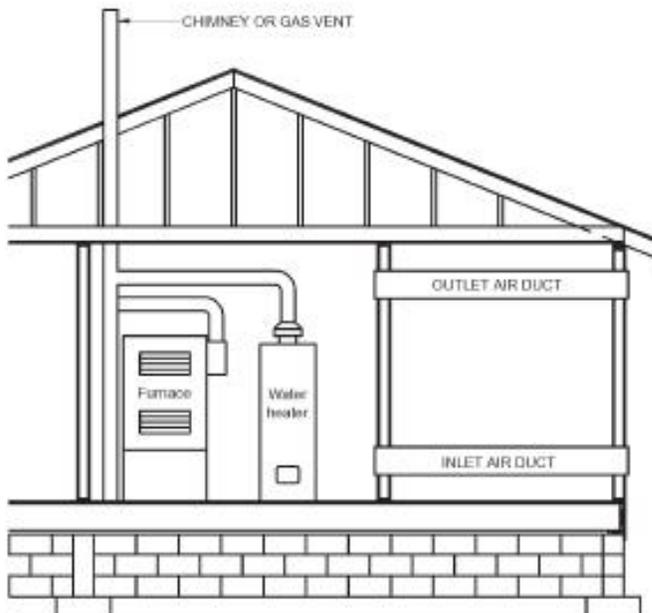
Two permanent openings, one commencing within 12 inches of the top and one commencing within 12 inches of the bottom of the enclosure, shall be provided. The openings shall communicate directly, or by ducts, with the outdoors or spaces that freely communicate with the outdoors.

2.1.1 Vertical Ducts



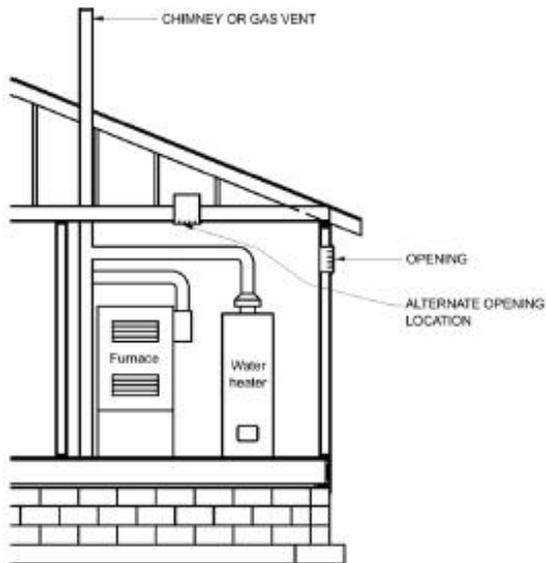
Where directly communicating with the outdoors, or where communicating with the outdoors through vertical ducts, each opening shall have a minimum free area of 1 square inch per 4,000 Btu/h of total input rating of all appliances in the enclosure. (Total BTU Input of all Appliances / 4,000 = Total Free Area Required)

2.1.2 Horizontal Ducts



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. (Total BTU Input of all Appliances / 2,000 = Total Free Area Required)

2.2 One-permanent-opening method



One permanent opening, commencing within 12 inches of the top of the enclosure, shall be provided. The appliance shall have clearances of at least 1 inch from the sides and back and 6 inches from the front of the appliance. The opening shall directly communicate with the outdoors or through a vertical or horizontal duct to the outdoors, or spaces that freely communicate with the outdoors and shall have a minimum free area of 1 square inch per 3,000 Btu/h of the total input rating of all appliances located in the enclosure and not less than the sum of the areas of all vent connectors in the space.

(Total BTU Input of all Appliances / 3,000 = Total Free Area Required)

Combination Indoor & Outdoor Combustion Air

Where used, openings connecting the interior spaces shall comply with the indoor combustion air section. The size of the openings communicating with the indoor space is based on the total input rating of all appliances in the space, regardless of additional air supplied from the outdoors.

Outdoor opening(s) shall be located in accordance with the outdoor combustion air section.

The outdoor opening(s) size shall be calculated in accordance with the following:

1. The ratio of interior spaces shall be the available volume of all communicating spaces divided by the required volume. (available volume/required volume)
2. The outdoor size reduction factor shall be one minus the ratio of interior spaces. (1 - available volume/required volume)
3. The minimum size of outdoor opening(s) shall be the full size of outdoor opening(s) calculated in accordance with the outdoor combustion section, multiplied by the reduction factor. The minimum dimension of air openings shall be not less than 3 inches.

reduced free area based on combination method = calculated total free area based on outdoor combustion air section x (1 - available volume/required volume)