

GAS PRESSURE REQUIREMENT. Available pressure to Flame Grid must overcome pressure drops through the burner and its gas train. Table 4 shows natural gas capacities at 1" w.c. pressure drop (with standard gas port drilling).

To determine gas pressure drop across the 4950-3624 Burner selected above, apply the flow square root law:

$$1" \text{ w.c.} \times \left(\frac{8330 \text{ cfh}}{2380 \text{ cfh}} \right)^2 = 12.3" \text{ w.c. } \Delta P.$$

Supply pressure must equal this **plus** duct pressure at the burner plus pressure drops through the gas train.

Warning: Minimum gas pressure drop across the burner is 0.7" w.c. Lower drops may cause uneven gas distribution in the burner. Maximum drop with good flame stability is 3 psi.

PILOTS, FLAME SUPERVISION. Options available:

- Option 1 — raw gas pilot/flame rod
- Option 2 — raw gas pilot/UV
- Option 3 — premix pilot/flame rod
- Option 4 — premix pilot/UV

If UV is specified, an adapter nipple is furnished, but detector must be purchased separately. Flame rods are furnished when Option 1 or 3 is specified.

Raw gas pilots require combustion air from the fume stream. A spark electrode ignites gas and air as they mix. Gas pressure at the pilot inlet must exceed duct pressure by at least 3" w.c. Raw gas pilots should be ignited with normal air. After the main burner flame is ignited, the fume-laden reduced-oxygen air can be introduced into the duct.

If dirty effluent might foul the raw gas pilot igniter, a premix pilot is recommended. This pilot requires at least 4 psi combustion air from an external source (blower or compressed air reducer).

If effluent is "clean," either a flame rod or UV detector is suitable. High particulate loads may foul a flame rod. Dense smoke may blind a UV detector. Choose flame supervision based on specific conditions.

An interrupted pilot must be used. A constant pilot is a safety hazard and causes uneven heating of the burner. When spark igniting raw gas pilots, flame detection system must interrupt spark. Spark can dissociate raw gas into carbon compounds that over time could ground the spark plug.

Table 4. Natural gas capacities

Burner designation	Capacity scfh @ 1" w.c. ΔP	Burner designation	Capacity scfh @ 1" w.c. ΔP
4950-0812	270	4950-2624	1730
4950-1212	390	4950-3624	2380
4950-1412	480	4950-2648	3470
4950-2012	670	4950-3648	4760
4950-1424	940	4950-5248	6940
4950-2024	1340	4950-7248	9500

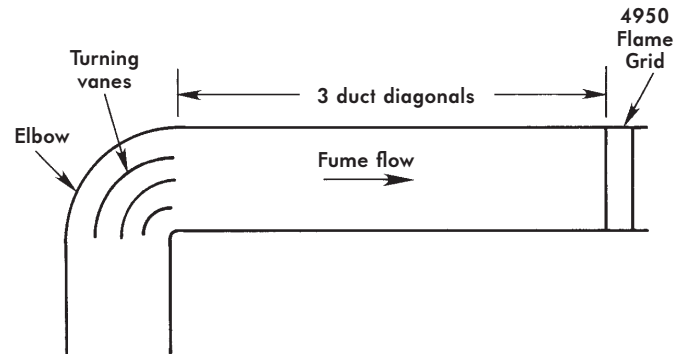
□ Inside duct dimensions for first 8-10" downstream of Flame Grid must conform to burner dimensions A and B (e.g., 14" x 12" for 4950-1412).

○ Dwell chamber cross sectional area must be at least twice nominal burner area (dimension A x dimension B).

WARNING: Situations dangerous to personnel and property may exist with the operation and maintenance of any combustion equipment. The presence of fuels, oxidants, hot and cold combustion products, hot surfaces, electrical power in control and ignition circuits, etc., are inherent with any combustion application. Components in combustion systems may exceed 160°F (71°C) surface temperatures and present hot surface contact hazard. Fives North American Combustion, Inc. suggests the use of combustion systems that are in compliance with all Safety Codes, Standards, Regulations and Directives; and care in operation.

INSTALLATION. Flame Grids are inserted through duct wall cutouts (see page 4 for cutout dimensions).

Fume flow pattern to the burner must be as uniform as possible to assure complete incineration. Therefore, locate Flame Grids at least 3 duct diagonals downstream from any elbow or fan; turning vanes are recommended in elbows.



Duct downstream of burner must be enlarged and refractory-lined. See Figure 2. Always install one or more observation ports (e.g., North American 8792) downstream of the burner for observation of the complete grid surface.

Flame Grids can be installed in horizontal or vertical ducts. If fume stream contains particulate matter, burner duct should be horizontal to prevent particulate accumulation on the grid. Excessive buildup can require frequent cleaning.

4950 Burners with "A" dimension 20" or greater have support plates near the free end of the grid. These plates should be attached to duct wall or suitable structural members to support free end.

Figure 2. Typical Flame Grid installation.

Continuous weld this mounting plate to duct, centered and square with 1/8" clearance between grid and duct wall or silhouette plate. Burner has provision for removing from mounting plate if necessary.

