**OPERATION**

Burners are designed for a nominal 6"wc air pressure. Stoichiometric firing at this nominal capacity will result in a fuel pressure requirement of 8 psig at the burner. Operation is quiet and the burner is stable over a wide range of air/gas ratios ranging from 30% fuel rich to 1000% excess air at 6"wc. Stoichiometric turndown is 10:1 with 6"wc main air pressure. In installations with high excess air rates, FGR, or preheated air, select burner size based upon heat input. Air pressure can then exceed 6"wc, but not beyond 10"wc. For multiple burner installations requiring high turndown capability, air inlet orifices should be considered to ensure adequate header pressure for uniform air distribution at low inputs.

Standard design is for 8 psig gas pressure at the burner; however a 2 psig option is available in sizes up to -20 if gas pressure is limited. Be sure to specify the LO option when ordering the 2 psig model.

A constant gas jet at 8 psi and 5% of maximum capacity maintains flame definition as input is reduced.

A low fire start is required at 1"wc or less main air pressure.
CONTROL
Mass flow control is recommended. Standard 4384 Fuel Directed® Burners have a single gas connection with internal radial/forward gas adjustment for flame shaping.

Main and center jet gas should be supplied to the burner at the same time. See flow control schematic.

PILOT and FLAME SUPERVISION
Burners are ignited with a gas-boosted pilot. Pilot air pressure must be at least 10"wc, and pilot regulator must be cross-connected to the pilot air line (see Sheet 4014).

If flame supervision is used, pilot must be of the interrupted type. UV flame detection is recommended (using an 883_-D adapter). It is possible for a UV scanner mounted on this burner to sight flame(s) of other burners in the same firing chamber. Consult Fives North American for configuration guidance on multiple burner applications.

Typical Single Burner Fuel Directed Flow Control Schematic

BURNER ADJUSTMENTS
1. The flame length adjusters are located on the side of the gas inlet connection. Initially set both the short (S) and the long (L) flame adjustment screws equally open. (Fully close both adjusters by turning them clockwise, then open 2 turns.)

2. Establish pilot flame. See Sheet 4014 for instructions.

3. Establish main flame. If main flame cannot be established, open (S) and (L) flame adjustment screws equally until a flame is established.

4. With an established flame, drive the system to high fire. Set air/fuel ratio.

To order, specify: 4384-(code for pipe size)-(A, if applicable) / (LO for 2 psig model) Burner Complete (specify Arrangement Designators--see Dimensions & Installation 4384).

Examples: 4384-10-A 10" Burner Complete with arrangement 3a1
4384-12/LO 12" Low Gas Pressure Burner Complete with arrangement 1c3

LOW NOx
The 4384 Fuel Directed Burner is an inherently Low NOx burner. In conjunction with other NOx reducing features, it is capable of meeting emission limitations for new or retrofit applications in environmentally sensitive installations. Contact your Fives North American Sales Engineer for specific applications.

BURNER TILE CONSTRUCTION
4384 Burners do not include a tile. Tunnel shapes and recommended installation is shown on Dimensions & Installation 4384.

OTHER FUELS
For other gaseous fuels and oils, contact your Fives North American Sales Engineer.

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, heat surfaces, electrical power in control and ignition circuits, etc., are inherent with any combustion application. Parts of this product may exceed 160°F in operation and present a contact hazard. Fives North American Combustion, Inc. urges compliance with National Safety Standards and Insurance Underwriters recommendations, and care in operation.

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