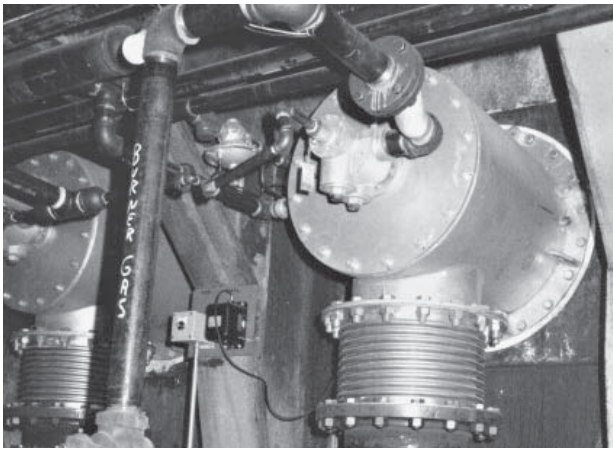


North American Hot Air ATP™ Adaptive Thermal Profile Low NO_x Burners for High Temperature Applications

For reheat furnaces, process heaters, aluminum melters, etc. from 1800 F to 2600 F.



These Low NO_x ATP Burners are firing a new hot strip mill reheat furnace.

For preheated air applications, 4472 Burners have refractory lined bodies and backplates. Internal parts include a refractory stabilizer and an investment cast A330SST nozzle. For cold air applications, refer to Bulletin 4482.

Burners use gas pressure to create a flame shape and heat pattern that is most advantageous for the furnace contour and application. A controlled flame shape is desirable in almost any application--it is essential in many to realize optimum furnace performance.

4472 ATP Burners are used with combustion air temperatures ranging from ambient to 1200 F, on a wide variety of furnaces operating up to 2600 F. Adaptive profiling principles enable these burners to vary flame configuration from approximately 750 000 Btu/hr per foot of length to 1 700 000 Btu/hr per foot. User can manually select optimum flame shape with the flame adjustment, which is an integral part of the gas connection.

OPERATION

Burners are designed for 10"wc maximum recommended air pressure. 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 10"wc.

Stoichiometric turndown is 10:1 with 10"wc main air pressure (thermal turndown is extended to 15:1).

Standard design is for 8 psig gas at the burner. To optimize performance, the temperature of preheated air should be considered when ordering. See back side for operating temperatures and ordering information.

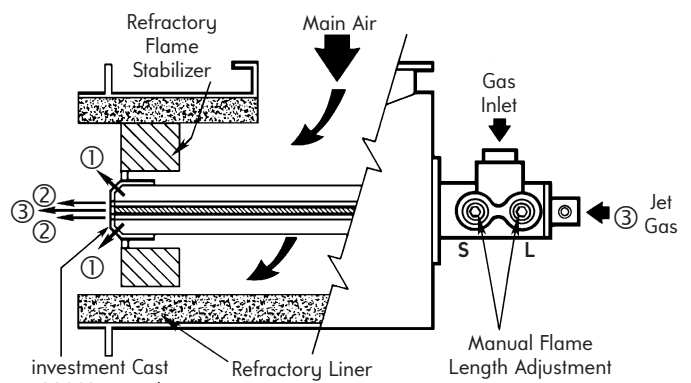
A constant gas jet at 8 psi and 5% of maximum capacity maintains flame definition as input is reduced.

A low fire start is required at 1"wc or less main air pressure.

Burners are designed to be mounted no more than 15° from horizontal. Contact Fives North American Combustion, Inc. if your application requires a greater angle.

Adaptive Thermal Profiling (ATP) distributes the heat where it's needed...

**2 to 34 million Btu/hr with hot air
(3 to 55 million Btu/hr with cold air)**



- ① Tangential gas--Increasing tangential gas flow (with flame adjustment screw S) shortens flame.
- ② Forward gas--Increasing forward gas flow (with flame adjustment screw L) lengthens flame.
- ③ Jet gas--used to maintain flame definition as input is reduced.

CONTROL

Mass flow control is recommended. Standard 4472 ATP™ Burners have a single gas connection with internal tangential/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). See Dimensions & Installation 4472 for pilot size.

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 North American for configuration guidance on multiple burner applications.

LOW NO_x

The 4472 ATP Burner is an inherently Low NO_x burner. In conjunction with other NO_x reducing features, it is capable of meeting emission limitations for new or retrofit applications in environmentally sensitive installations. Contact North American for specific applications.

BURNER TILE CONSTRUCTION

4472 Burners do not include a tile. Tunnel shapes and recommended installation shown on Dimensions & Installation 4472.

OTHER FUELS

For other gaseous fuels and oils, contact North America.

RANGE OF FLAME LENGTHS and DIAMETERS (2000 F Furnace) in feet with 8 psig gas

Air/gas ratio set for 10% excess air.

| Burner designation | SHORT FLAME (10% reduced capacity) air pressure | | LONG FLAME (full capacity) air pressure | | FLAME DIA. (full capacity) long or short |
|--------------------|---|-------|---|-------|--|
| | 6"wc | 10"wc | 6"wc | 10"wc | |
| 4472-8 | 3½ | 6 | 8 | 15 | 2.5 |
| 4472-9 | 5 | 8 | 10 | 15 | 2.5 |
| 4472-10-A | 6 | 8 | 12 | 16 | 3 |
| 4472-10-B | 7 | 9 | 15 | 18 | 3 |
| 4472-12 | 7 | 9 | 16 | 20 | 3 |
| 4472-14 | 9 | 12 | 18 | 24 | 3.5 |
| 4472-16 | 11 | 14 | 24 | 30 | 3.5 |
| 4472-18 | 14 | 18 | 28 | 34 | 4 |
| 4472-20 | 18 | 22 | 32 | 40 | 4 |
| 4472-22 | 20 | 25 | 36 | 45 | 4.5 |
| 4472-24 | 23 | 28 | 45 | 50 | 5 |

COMBUSTION AIR CAPACITIES, scfh 1000 F at 10"wc ΔP long flame mode

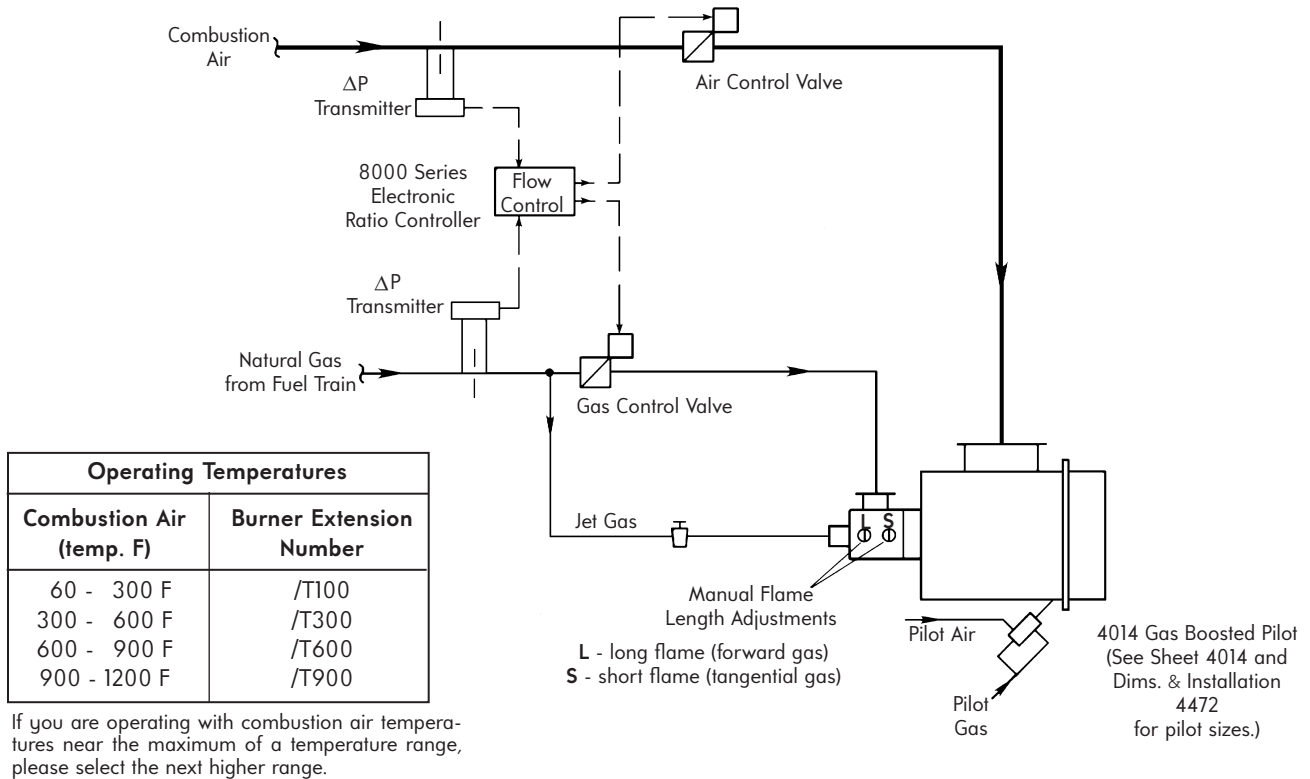
Capacities are reduced up to 10% in short flame mode.

| Burner designation | air pressure | | |
|--------------------|--------------|---------|---------|
| | 0.1"wc* | 6"wc | 10"wc† |
| 4472-8 | 2 470 | 19 200 | 24 700 |
| 4472-9 | 4 350 | 33 600 | 43 500 |
| 4472-10-A | 5 410 | 42 000 | 54 200 |
| 4472-10-B | 6 870 | 53 300 | 68 700 |
| 4472-12 | 9 730 | 75 400 | 97 300 |
| 4472-14 | 12 200 | 94 300 | 121 600 |
| 4472-16 | 15 800 | 124 700 | 160 500 |
| 4472-18 | 20 100 | 158 700 | 204 900 |
| 4472-20 | 25 500 | 197 000 | 254 800 |
| 4472-22 | 31 000 | 219 500 | 309 500 |
| 4472-24 | 37 100 | 286 400 | 369 700 |

*min. air rate

†max. recommended press.

Typical Single Burner ATP 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. Using the (S) and (L) flame adjustment screws, make the desired flame length adjustments. If high fire gas flow cannot be reached, open the (S) and (L) flame length adjustment screws equally until the proper gas flow is obtained. Correct air/fuel ratio as required.
5. Drive the system to low fire. Set air/fuel ratio. If used, adjust jet gas valve to improve the low fire flame definition.
6. Drive the system to high fire and verify flame length and air/fuel ratio.

To order, specify: 4472-(code for pipe size)-(A, if applicable)/(TX00 model) Burner Complete (specify Arrangement Designators-- see Dimensions & Installation 4472).

Examples: 4472-10-A/T600 10" Burner Complete, 600-900 F, with arrangement 3a1
4472-12/T100 12" Burner Complete, 60-300 F, with arrangement 1c3

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. Parts of this product may exceed 160F 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.