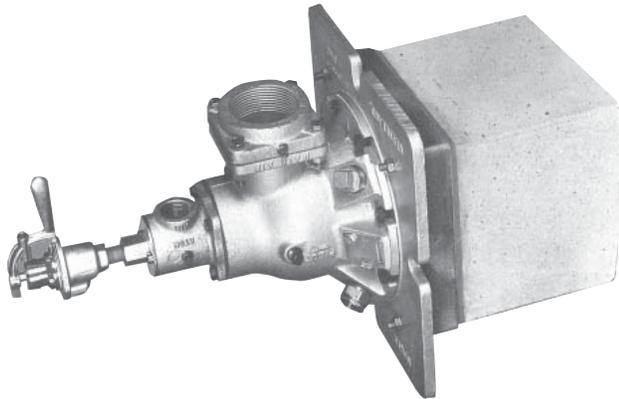


## North American Fire•All™ Oil Burners



**5422 Burner Complete shown with optional (recommended) Sensitrol Oil Valve.**

**5422 Fire•All Oil Burners** are ideal for heat treat and non-ferrous melting furnaces, kilns, ovens, air heaters, dryers, chemical process equipment, and other applications where superior temperature uniformity is required. (For higher temperature service, use the 5425 version.)

These sealed-in light oil burners are stable at correct ratio and with up to 50% excess fuel if additional air for combustion is in the furnace near the burner.

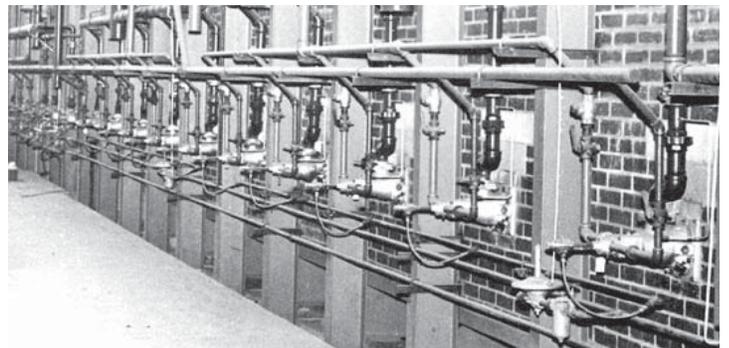
5422 Burners can also be operated with excess air (see Table 2) if lean operation is desirable for temperature uniformity or furnace versatility. Excess air can improve temperature uniformity by: (1) reducing hot mix temperatures to eliminate hot spots in front of the burners; (2) churning furnace atmosphere to reduce stratification; (3) creating positive furnace pressure to stop cold air infiltration; (4) increasing effective turndown.

### OPERATION

Burners can be lit at rich, lean, or correct oil/air ratio, then immediately turned to high fire. Required oil pressure at the burner is nearly zero, but a pressure drop of about 10 psi should be taken across the 1813 Sensitrol™ Valve. If furnace temperatures after shutdown exceed 1900 F, pass some air through the burner to prevent overheating.

### LIGHTING AND FLAME SUPERVISION

A 4011-12 pilot set is recommended for individual burner ignition. When multiple burners share a single pilot pre-mix header, a 4021-12 pilot tip per burner with an appropriately sized air/gas mixer is recommended. A manual torch can be used in some applications. Ultraviolet (UV) detector can be installed in one of three holes in the body, using an adapter listed in Bulletin 8832. UV scanners allow igniting with up to 14 psi main air. When using flame supervision, an interrupted pilot is required--do not use constant or intermittent pilots.



**Table 1.**

| Burner designation | COMBUSTION AIR CAPACITIES, scfh          |       |       |       |       |       |       | ATOMIZING AIR CAPACITIES, scfh |      |      |      |      |      |
|--------------------|--|-------|-------|-------|-------|-------|-------|--------------------------------|------|------|------|------|------|
|                    | Air pressure drop across the burner, psi |       |       |       |       |       |       |                                |      |      |      |      |      |
|                    | 0.1                                      | 1     | 5     | 6     | 8     | 12    | 16    | 14                             | 16   | 18   | 20   | 22   | 24   |
| <b>5422-2</b>      | 160                                      | 520   | 1160  | 1270  | 1470  | 1800  | 2100  | 500                            | 520  | 560  | 600  | 620  | 650  |
| <b>5422-3</b>      | 280                                      | 890   | 1980  | 2160  | 2500  | 3050  | 3550  | 500                            | 520  | 560  | 600  | 620  | 650  |
| <b>5422-4</b>      | 460                                      | 1450  | 3240  | 3540  | 4100  | 5000  | 5800  | 500                            | 520  | 560  | 600  | 620  | 650  |
| <b>5422-5</b>      | 750                                      | 2370  | 5300  | 5800  | 6700  | 8150  | 9450  | 640                            | 690  | 720  | 760  | 800  | 840  |
| <b>5422-6</b>      | 1180                                     | 3700  | 8300  | 9100  | 10500 | 12900 | 14800 | 800                            | 850  | 910  | 950  | 1000 | 1050 |
| <b>5422-7-A</b>    | 2070                                     | 6550  | 14600 | 16000 | 18500 | 22700 | 26200 | 870                            | 930  | 990  | 1040 | 1100 | 1150 |
| <b>5422-7-B</b>    | 2580                                     | 8150  | 18200 | 19900 | 23000 | 28200 | 32600 | 870                            | 930  | 990  | 1040 | 1100 | 1150 |
| <b>5422-8-A</b>    | 3320                                     | 10500 | 23500 | 25800 | 29700 | 36400 | 42000 | 2650                           | 2840 | 3000 | 3170 | 3320 | 3480 |

For total capacity, add combustion air and atomizing air. (For Btu/hr, multiply by 100.)

**Table 2. Maximum Excess Air Rates, %**

| Combustion Air Pressure at Burner | 5422-2 | 5422-3 | 5422-4 | 5422-5 | 5422-6 | 5422-7-A | 5422-7-B | 5422-8-A |
|-----------------------------------|--------|--------|--------|--------|--------|----------|----------|----------|
| 1 osi                             | 280    | 200    | 500    | 250    | 150    | 150      | 150      | 200      |
| 8 osi                             | 400    | 500    | 800    | 400    | 400    | 300      | 700      | 280      |
| 14 osi                            | 500    | 650    | 900    | 600    | 550    | 450      | 800      | 350      |

Above excess air rates with 9" long tile, with 14-22 osi atomizing air at the burner, and without pilot.

**CONSTRUCTION FEATURES**

Mounting plates are cast iron. Standard tiles are 9" long.† In furnace walls thicker than the tile length, tunnel beyond end of tile should be flared at least 30° included angle, starting at the tile OD.

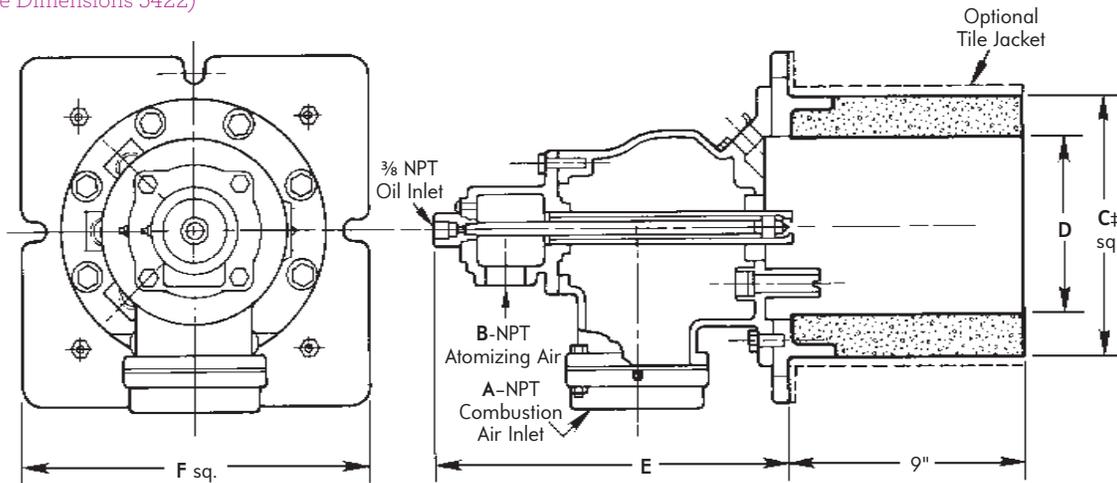
Jacketed Tiles. 5422- LC Burners have a carbon steel jacket around the tile for furnace walls with no refractory to support the tiles--maximum combustion chamber temperature: 800 F. For higher temperatures, specify -L4 for 304 or -L9 for 309 SST jackets.

Air inlets can be rotated in 90° increments, but air pipes should be brought in from top or side to prevent oil dripping into them.

An observation port is furnished with all burners.

The 5422 oil atomizer can be easily withdrawn to allow for inspection and/or cleaning of the oil nozzle.

**CLEARANCE DIMENSIONS, inches**  
(for details, see Dimensions 5422)



| Burner designation | A  | B  | C± | D | E        | F   | Approx. flame lengths with 16 osi Main Air (in open furnace) |
|--------------------|----|----|----|---|----------|-----|--|
| 5422-2             | 1¼ | ¾  | 8½ | 5 | 10 11/16 | 12  | 2'   |
| 5422-3             | 1½ | ¾  | 8½ | 5 | 10 11/16 | 12  | 2'   |
| 5422-4             | 2  | ¾  | 8½ | 5 | 10 11/16 | 12  | 2½'  |
| 5422-5             | 2½ | 1  | 8½ | 5 | 10 11/16 | 12  | 2½'  |
| 5422-6             | 3  | 1  | 8½ | 5 | 10 11/16 | 12  | 4'   |
| 5422-7-A           | 4  | 1¼ | 10 | 7 | 13 5/8   | 13½ | 6'   |
| 5422-7-B           | 4  | 1¼ | 10 | 7 | 13 5/8   | 13½ | 6'   |
| 5422-8-A           | 6  | 2  | 10 | 7 | 13 5/8   | 13½ | 6'   |

† See Dimensions 6422 for ceramic fiber wall installation recommendations.  
‡ 5422- LC metal jackets add about 1" to tile OD--see Dimensions 5422.

**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.



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