DUAL FUEL BURNERS

SERIES 6172

SAIFEE

COMBUSTION EQUIPMENT

6172 DUAL-FUEL BURNERS are widely used on 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 temperatures, use 6175 burners.)

These sealed-in, nozzle-mix burners for gas and/or distillate oil are stable on stoichiometric ratio with large amounts of excess air, or with up to 50% excess fuel (provided additional air for combustion is in the furnace near the burner).

OPERATION

Burners can be lit at rich, lean, or correct air/fuel ratio, then immediately turned to high fire. Required gas pressures are 1 osi at the burner for coke oven gas, less for natural gas. Required oil pressure at the burner is nearly zero, but a pressure drop of about 10 psi should be taken across the Sensitrol valve.

The most common ratio control system for 6172 burners uses a cross-connected regulator and Ratiotrol. Depending on application, flow balancing systems or fuel-only control are also very satisfactory.

If furnace temperature after shutdown rises above 1000°C, pass air through the burner to prevent over-heating. During gas operation, use at least 4 osi atomizing air to cool the atomizer.

LIGHTING/FLAME SUPERVISION

A Pilot Set is normally used to light 6172 burners. With gas, direct spark ignition of burners is possible. A manual torch can be used in some applications.

TABLE I. TOTAL AIR CAPACITIES* scfh (for BTU/hour multiply by 100)

MODEL	16 osi air at burner	Sensitrol oil valve
6172-2	2 600	1813-02A
6172-3	4 100	1813-02A
6172-4	6 300	1813-02A
6172-5	10 300	1813-02A
6172-6	15 700	1813-02B
6172-7A	27 000	1813-02C
6172-7B	33 500	1813-02C
6172-8A	44 800	1813-02C

* Includes combustion and atomizing air.

6172 burners accept ultraviolet scanners or flame rods for monitoring pilot or main flame. When using flame supervision, an interrupted pilot is required — do not use constant or intermittent pilots. If using direct spark ignition, turn off spark after burner is lit.

STANDARD CONSTRUCTION

Burner bodies are heat resistant cast iron with Inconel air tubes. Mounting plate and tile assembly can be separated from the burner body for installation. Air and gas connection orientation can be rotated in 90° intervals. Air and gas pipes should be brought in from the top or side to prevent oil dripping into them.

Burner is complete with cast iron mounting plate and 9" long 1750°C castable burner tile which must be supported and sealed in a hard refractory furnace wall. When the furnace wall is thicker than the tile length, the tunnel beyond the end of the burner tile should be flared at a 30° or greater included angle, starting at the OD of the tile. Extension tiles are not recommended.

TILE SUPPORT JACKETS

6172 burners with standard 9" long square tiles are also available with support jackets for applications such as air heaters where frequently the tile is not supported by refractory. They also can be mounted in furnaces when desired.

The burners have carbon steel jackets around the tile for applications where there is no furnace refractory to support the tile and where temperature surrounding the jacket does not exceed 400°C. AISI-304 or AISI-309 stainless steel jackets are also available for higher temperatures.

EXCESS AIR can improve temperature uniformity by avoiding hot spots in front of burners, by churning furnace atmosphere to reduce stratification, and by creating positive furnace pressure to eliminate cold air infiltration.

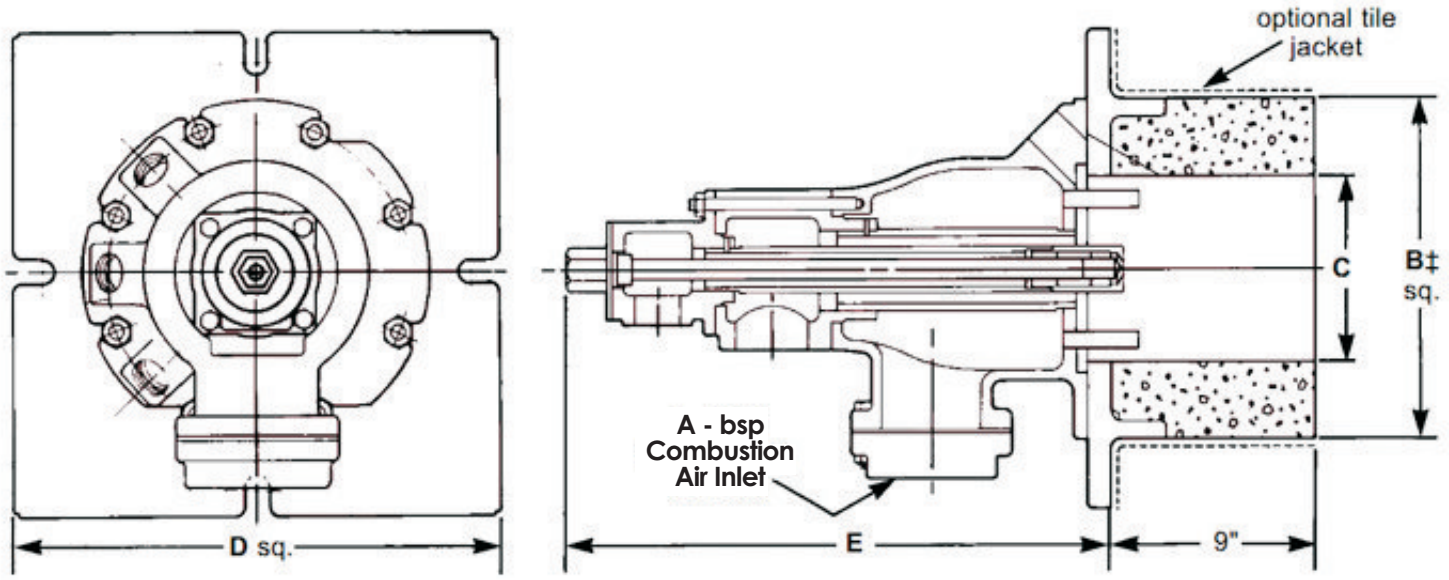
Excess air can give very high effective burner turndown. Thus a furnace used for high temperature work (such as heat treating at 1000°C) with burners firing on stoichiometric air/fuel ratio can also be used for low temperature jobs (such as drying at 300°C) with burners firing on lean ratio.

TABLE II. ATOMIZING AIR CAPACITIES in scfh

MODEL	air pressure drop across burner in osi					
	14	16	18	20	22	24
6172-2, 3, 4	500	520	560	600	620	650
6172-5	640	690	720	760	800	840
6172-6	800	850	910	950	1000	1050
6172-7A, 7B	870	930	990	1040	1100	1150
6172-8A	2650	2840	3000	3170	3320	3480

TABLE III. COMBUSTION AIR CAPACITIES in scfh (not including atomizing air)

MODEL	0.1	1	5	6	8	12	16	approx. flame lengths with 16 osi Main Air gas	oil
6172-2	160	520	1160	1270	1470	1800	2100	½'	1½'
6172-3	280	890	1980	2160	2500	3050	3550	1½'	2'
6172-4	460	1450	3240	3540	4100	5000	5800	2'	2½'
6172-5	750	2370	5300	5800	6500	8150	9450	2½'	2½'
6172-6	1180	3700	8300	9100	10500	12900	14800	3'	4'
6172-7A	2070	6550	14600	16000	18500	22700	26200	6'	6'
6172-7B	2580	8150	18200	19900	23000	28200	32600	6'	5'
6172-8A	3320	10500	23500	25800	29700	36400	42000	7'	6'



NOTE: For 6172-8, air and gas connections cannot be piped in the same plane because the "flower pot" type air connection flange would interfere with the 2½" gas line.

TABLE IV. CLEARANCE DIMENSIONS

MODEL	dimensions in inches A	B	C	D	E
6172-2	1¼	8½	5	12	13⅝
6172-3	1½	8½	5	12	13⅝
6172-4	2	8½	5	12	13⅝
6172-5	2½	8½	5	12	13⅝
6172-6	3	8½	5	12	13⅝
6172-7A	4	10	7	13½	17⅞
6172-7B	4	10	7	13½	17⅞
6172-8A	6	10	7	13½	17⅞

TABLE V. MAXIMUM EXCESS AIR RATES IN % (WITHOUT PILOT)

Burner Designation	Combustion Air Pressure (Gas) 1 osi	8 osi	14 osi	Combustion Air Pressure (Oil) 1 osi	8 osi	14 osi
6172-2	-	380	500	_	380	500
6172-3	330	1000	1300	210	480	670
6172-4	560	1560	1560	480	800	900
6172-5	1070	1440	1150	50	250	400
6172-6	380	1000	1400	140	560	610
6172-7A	3200	4900	1000	160	330	450
6172-7B	900	1450	1600	150	700	830
6172-8A	460	660	400	200	280	350

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