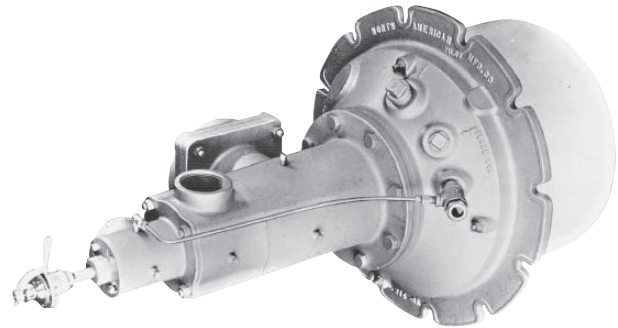


North American Fire•All™ Dual-Fuel™ Burners

Bulletin 6514

- Dual Fuel Burner - gas or oil (light or heavy grade oil)
- Conventional forward flame pattern
- 1.8 to 30 million Btu/hr
- Chambers up to 2400F (with alloy nose)
- Includes low pressure fuel oil atomizer



6514 Burner Complete shown with optional (recommended) Sensitrol™ Oil Valve.

6514 FIRE•ALL Dual-Fuel Burners are nozzle mix, sealed-in burners for gas, light oil, or heavy oil. Capable of efficient operation throughout a wide temperature range, these burners are equally at home on low temperature ovens and high temperature forge and melting furnaces.

Ruggedly built for sustained, maintenance-free operation, 6514 Burners also provide for quick change of fuels without disturbing process operations.

Sealed mountings help maintain furnace pressure, controlled atmosphere, and closer air/fuel ratio control--all contributing to better product quality.

Fire•All Burners are a proven workhorse on all types of furnaces.

COMBUSTION CHARACTERISTICS

Oil. Oil viscosity at the burners must not exceed 100 SSU. Oil pressure at air/fuel Ratiotrol™ should be between 25 and 30 psi. Oil pressure at rated capacity is 10 to 15psi at Sensitrol™ and less than 2 psi at burner. Minimum atomizing air pressure at the burners is 14 osi for light oil, 22 osi for heavy oil.

Gas. Atomizing air (4 osi minimum) should be left on to protect the atomizer. Maximum required natural gas pressure at the burner for stoichiometric ratio is less than 4osi.

Air/Fuel Ratio. 6514 Dual-Fuel Burners are stable throughout a wide range from excess fuel to excess air. They can operate with excess fuel without forming carbon, but additional air for complete combustion must be available in the furnace near the burner.

For limits in a specific case, either rich or lean, consult North American.

Turndown. Fire•All Burners can be turned down to atomizing air only (with fuel to match) except when burning residual oils in a cold, tight furnace.

**Total air capacities
(including main and atomizing air)**

Burner designation	16 osi air pressure drop across the burner				24 osi air pressure drop across the burner				Approx. flame lengths with 16 osi main air (in open furnace)
	Air ^① scfh	Light oil ^② gph	Heavy oil ^③ gph	Gas ^④ scfh	Air scfh	Light oil gph	Heavy oil gph	Gas scfh	
6514-6	17 900	13	12	1 790	21 900	16	15	2 190	4' - 5'
6514-7	28 400	21	19	2 840	34 800	26	23	3 480	5' - 6'
6514-8-A	48 900	36	33	4 890	60 000	44	40	6 000	8' - 9'
6514-8-B	81 500	60	54	8 150	100 000	74	67	10 000	9' - 12'
6514-9	165 000	122	110	16 500	202 000	150	135	20 200	15' - 18'
6514-10	247 000	183	165	24 700	303 000	224	202	30 300	20'

① For Btu/hr, multiply by 100

② Light oil at 135 000 Btu/gal.

③ Heavy oil at 150 000 Btu/gal.

④ Natural gas at 1000 Btu/cf.

**Total air capacities
(including main and atomizing air)**

Burner designation	Main air capacities in scfh						Atomizing air capacities in scfh					
	Air pressure drop across the burner in osi						Air pressure drop across the burner in osi					
	1	5	6	8	12	16	14	16	18	20	22	24
6514-6	3 710	8 300	9 100	10 500	12 900	14 900	2 800	3 000	3 180	3 360	3 510	3 660
6514-7	6 100	13 600	15 000	17 200	21 000	24 400	3 770	4 030	4 270	4 500	4 720	4 900
6514-8-A	10 600	23 700	26 000	30 000	36 700	42 400	6 050	6 500	7 000	7 300	7 600	7 850
6514-8-B	17 600	39 200	43 000	49 600	60 500	70 000	10 600	11 300	12 000	12 700	13 200	13 800
6514-9	36 600	82 000	89 500	104 000	127 000	146 000	17 200	18 400	19 600	20 700	21 600	22 500
6514-10	54 500	122 000	135 000	154 000	189 000	218 000	27 200	29 100	30 900	32 600	34 100	35 500

Flame Supervision. An ultraviolet cell† will monitor pilot or main flame on gas or oil. For maximum safety, Fives urges **interrupted** pilots when flame safeguards are used--pilots should be on only for a preset ignition period (usually 15 seconds), after which flame supervision detects main fire only. Adapters for mounting flame detection devices on 6514 Burners are tabulated on Bulletin 8832.

Tile/Installation. Burner tiles are cast refractory rated for 2800F furnace temperature. They should be supported securely in the furnace wall by castable refractory (not insulation) at least 9" thick all around the tile, extending back to the furnace shell and securely anchored to it. (See Supplement DF-M1.)

Tiles are replaceable in the field except for the 6514-10, whose mounting must be returned to the factory for tile replacement (or purchase a spare mounting plate with a tile cast onto it).

Complete burners include tile, mounting plate, and an observation port into which a small quantity of atomizing air is introduced to keep the glass clear. Order pilot tips and Sensitrol™ Oil Valve separately. See 6514 Dimension Sheet for recommended Sensitrol™ oil valve and premix pilot tip.

Jacketed Tile options are available for applications where the tile is not supported by furnace refractory. Jackets are available in three different metals and have maximum temperature ratings for each. They must be protected with sufficient insulation so as not to exceed rated temperature. The maximum temperature rating depends upon frequency of heat-up/cool-down cycles. As an example, batch annealing furnaces that are heated and cooled every day should use the "intermittent exposure" ratings. Continuous annealing furnaces that remain at the same temperature for months at a time, can use the higher "continuous" rating.

Designation	Jacket Metal	Continuous max.temp.	Intermittent exposure
6514- -LC	carbon steel	700 F	700 F
6514- -L4	304 stainless	1600 F	1500 F
6514- -L9	309 stainless	1900 F	1800 F

† Cleaning air must be introduced into the port downstream of the sensor to keep oil and poc's off the lens.

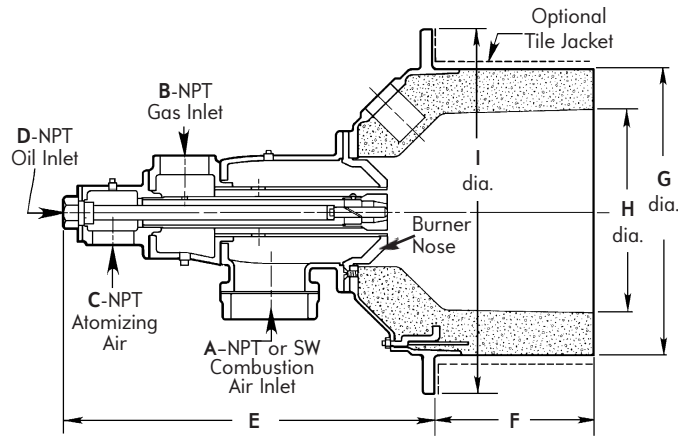
Burner Nose options are available for sizes shown below and can be specified in the product number. The burner nose establishes main combustion air flow and influences flame propagation. Nose material is either cast iron that is suitable for cold air applications up to 1800F, or cast stainless alloy for preheated air (maximum 700F) applications up to 2400F.

Mat'l	Cap'y	-6	-7	-8A	-8B	-9	-10
Cast iron	1.0	√	√	√	√	√	√
Cast Alloy	1.0	√	√	√	√	√	√
Cast iron	1.1		√	√	√	√	√
Cast Alloy	1.1		√	√	√	√	√
Cast iron	1.2			√	√	√	√
Cast Alloy	1.2			√	√	√	√
Cast iron	1.3			√	√	√	√
Cast Alloy	1.3			√	√	√	√

The product designation 1.0 represents standard main air capacity shown on page 1. Use of an extra capacity burner nose will result in either more air at 16 osi or standard air flow at lower pressure. Extending the capacity of the burner by increasing air pressure beyond 16 osi, or using the extra capacity nose, is acceptable for most gas and light oil applications. Specific applications involving either low Btu fuels or heavy oil and extra capacity should be reviewed with North American.

Also, when firing extra capacity, the combustion air flow velocity within the supply piping, and associated pressure loss, can be excessive for some burners. The -8B, -9 and -10 products when operated at 1.2 or 1.3 capacity will develop high pipe velocity based on the burner's air connection size. As an alternative to increasing blower pressure, an oversized air inlet can be purchased separately for these size burners. The connections are SW-type (slip-on sleeve or welded construction) and are one pipe size larger than the standard supply. Nose and oversize air connection part numbers can be found in supplement literature (see Parts List and Burner Options documents).

Options are available for the 6514 burner but require consultation with North American sales for application and ordering information. See Sheet 6514-3 for an overview of burner options.



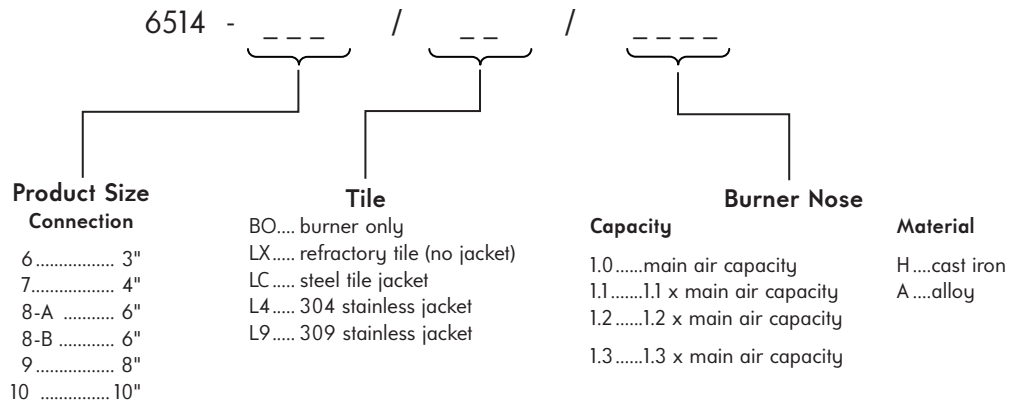
CLEARANCE DIMENSIONS (for details, see Dimensions 6514)

Burner designation	dimensions in inches									Wt. lbs.
	A†	B	C	D	E	F	G	H	I	
6514-6	3	2	1½	¾	18¾	9	15	10¾	19½	195
6514-7-	4	2½	2	¾	20 ¹³ / ₁₆	8 ⁷ / ₈	16	11¾	20½	225
6514-8-A	6	2½	2½	¾	27 ⁷ / ₁₆	10	17¾	12¾	22¾	335
6514-8-B	6	3	3	¾	31¼	12 ⁷ / ₈	19	13½	24	450
6514-9	8	4	4	½	38 ⁵ / ₈	13 ⁷ / ₁₆	23	16	28	795
6514-10	10	6	6	½	45 ⁵ / ₈	13 ³ / ₈	27½	20½	32½	1035

† SW connection standard for -9 and -10 only.

DIMENSIONS SHOWN ARE SUBJECT TO CHANGE. PLEASE OBTAIN CERTIFIED PRINTS FROM FIVES NORTH AMERICAN COMBUSTION, INC. IF SPACE LIMITATIONS OR OTHER CONSIDERATIONS MAKE EXACT DIMENSION(S) CRITICAL.

ORDERING INFORMATION



Example 1 6514-8-A/LC/1.2A Fireall gas burner complete with carbon steel jacketed tile and 1.2 capacity alloy nose

Example 2 6514-6/BO/1.0H Fireall gas burner only with standard capacity iron nose

Example 3 6514-9/LX/1.2H Fireall gas burner complete with refractory tile and 1.2 capacity iron nose

Note: See Supplement 6514-6 for cross referencing old product numbers.

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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