

North American Fire•All™ Dual-Fuel™ Burners

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



6514 Fire•All™ Dual-Fuel™ Burners

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

Product Overview | 6514 Fire•All™

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)

flame lengths Burner designation	16 osi air pressure drop across the burner				24 osi air pressure drop across the burner				Approx. 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

Product Overview | 6514 Fire•All™

Flame Supervision. An ultraviolet cell‡ will monitor pilot or main flame on gas or oil. For maximum safety, North American 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 2800°F 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 1800°F, or cast stainless alloy for preheated air (maximum 700°F) applications up to 2400°F.

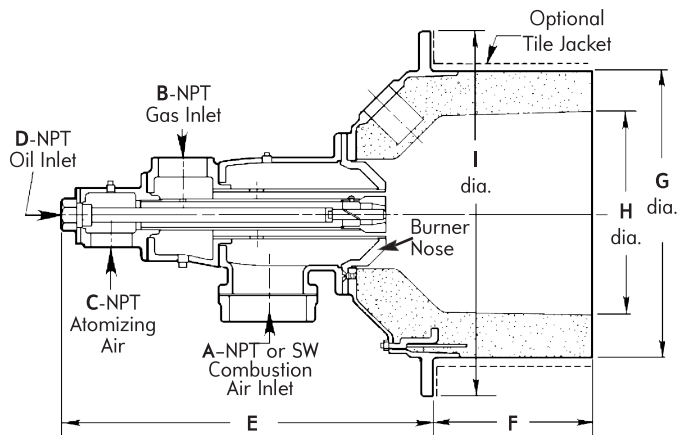
Mat'l	Cap'y	-6	-7	-8A	-8B	-9	-10
Cast iron	1.0	✓	✓	✓	✓	✓	✓
Cast Alloy	1.0	✓	✓	✓	✓	✓	✓
Cast iron	1.1		✓	✓	✓	✓	✓
Cast Alloy	1.1		✓	✓	✓	✓	✓
Cast iron	1.2			✓	✓	✓	✓
Cast Alloy	1.2			✓	✓	✓	✓
Cast iron	1.3			✓	✓	✓	✓
Cast Alloy	1.3			✓	✓	✓	✓

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.

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. Components in combustion systems may exceed 160°F (71°C) surface temperatures and present hot surface contact hazard. Fives North American Combustion, Inc. suggests the use of combustion systems that are in compliance with all Safety Codes, Standards, Regulations and Directives; and care in operation.



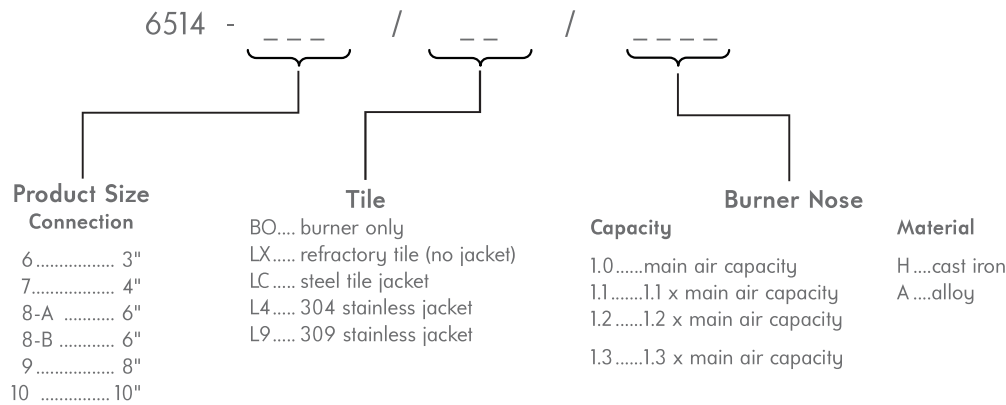
CLEARANCE DIMENSIONS (for details, see Dimensions 6514)

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	20⅓	8⅞	16	11¾	20½	225
6514-8-A	6	2½	2½	¾	27⅞	10	17¾	12¾	22¾	335
6514-8-B	6	3	3	¾	31¼	12⅞	19	13½	24	450
6514-9	8	4	4	½	38⅞	13⅞	23	16	28	795
6514-10	10	6	6	½	45⅞	13¾	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.

CONTACT

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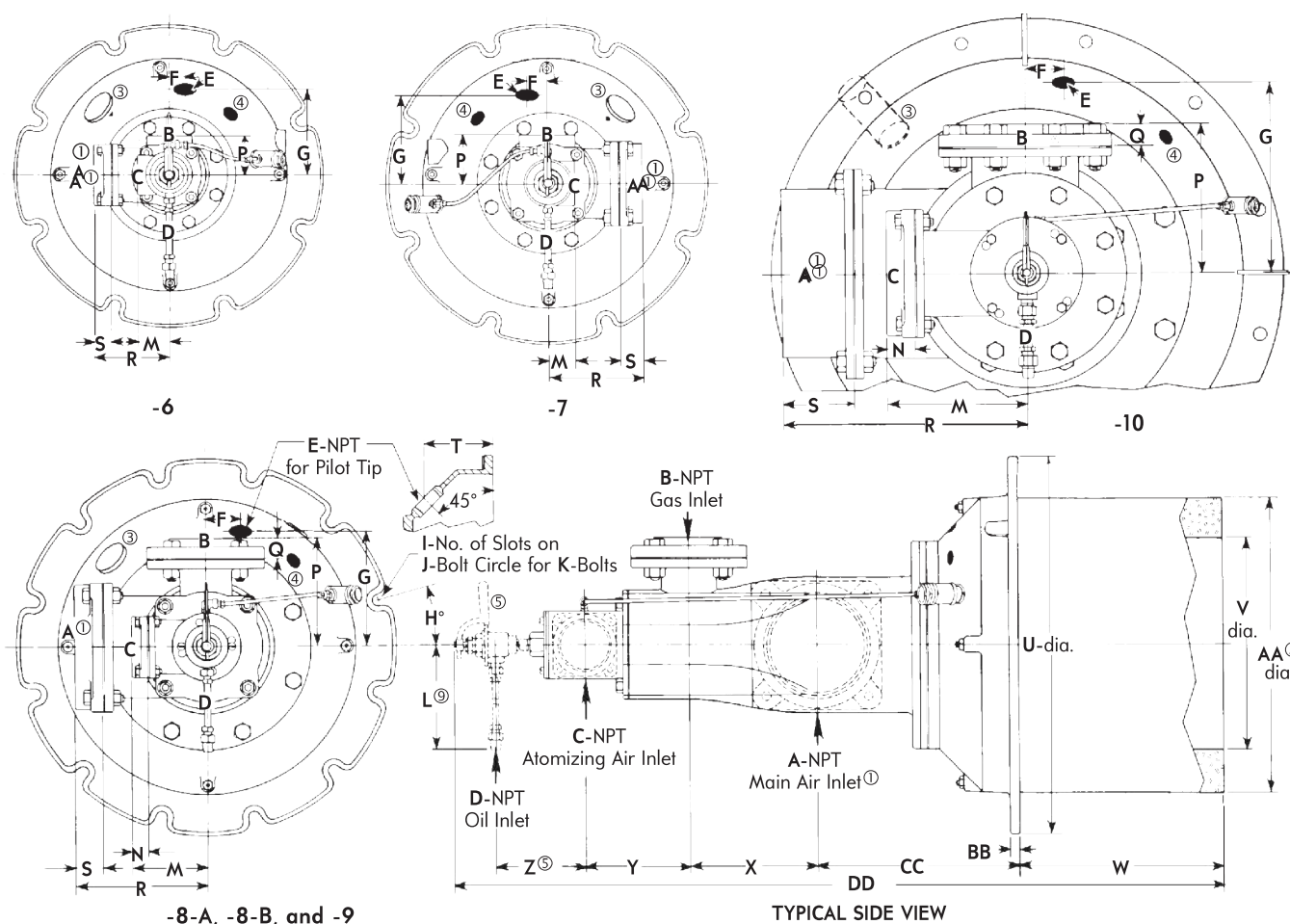
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North American Fire•All™ Dual-Fuel™ Burners

Dimensions 6514

DIMENSIONS – Main air, gas, atomizing air, and oil connections can be rotated relative to one another and to the mounting plate. Drawings show connections as assembled at the factory. These arrangements reduce maintenance by preventing oil dripping into air or gas manifolds (which should be above burners) and by minimizing dirt accumulation in pilots and flame supervisory devices. Pilot and main air connections cannot be aligned in the same direction.



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IF SPACE LIMITATIONS OR OTHER CONSIDERATIONS MAKE EXACT DIMENSION(S) CRITICAL.

Burner designation	Dimensions in inches and degrees														
	A ^①	B	C	D	E	F	G	H°	I	J	K	L ^⑨	M	N	P
6514-6	3	2	1½	¾	¾	1	5⅞	22½	8	18	⅝	19¾	2	—	2½
6514-7	4	2½	2	¾	1¼	1¼	5¾	22½	8	19	⅝	19¾	1¾	—	3¼
6514-8-A	6	2½	2½	¾	1¼	1½	6⅞	15	12	21¼	⅝	19¾	2⅜	—	3⅞
6514-8-B	6	3 ^⑧	3 ^⑦	¾	1¼	2¼	7⅞	15	12	22½	⅝	19¾	5⅞ ^①	1⅞	6⅞
6514-9	8	4 ^⑧	4 ^⑦	½	1½	2¼	9⅞	15	12	26½	⅝	20¾	7⅞ ^①	1⅞	8⅞
6514-10	10	6 ^⑧	6 ^⑦	½	1½	2½	12⅞	15	12	30½	¾	20¾	8⅞ ^①	1⅞	9⅞

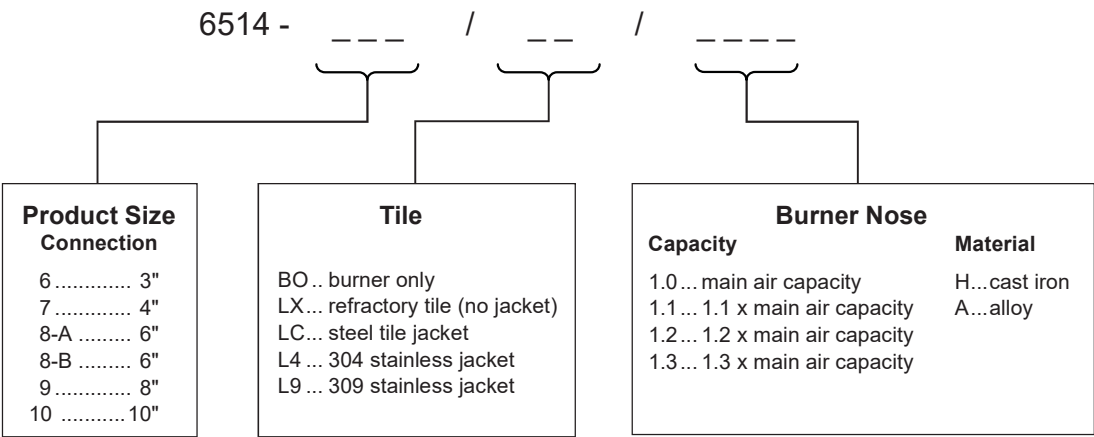
Burner designation	Dimensions in inches											6514- /LX (refractory tile)				wt lb
	Q	R	R _i ^⑥	S	T	U	V	W	X	Y	Z ^⑤	AA ^②	BB	CC	DD ^⑤	
6514-6	—	5 ³ / ₁₆	10 ³ / ₈	1 ⁹ / ₁₆	3 ⁷ / ₁₆	19 ¹ / ₂	10 ³ / ₈	9	4	4	4 ¹ / ₁₆	15	5 ⁵ / ₈	8 ¹ / ₄	32 ³ / ₁₆	195
6514-7	—	6 ¹ / ₈	10 ⁵ / ₈	1 ⁹ / ₁₆	3 ¹⁵ / ₁₆	20 ¹ / ₂	11 ³ / ₈	8 ⁷ / ₈	4 ³ / ₄	4 ¹ / ₁₆	4 ⁷ / ₁₆	16	5 ⁵ / ₈	9 ¹ / ₄	34 ³ / ₈	225
6514-8-A	—	7 ³ / ₈	11 ¹ / ₄	1 ¹³ / ₁₆	4 ⁵ / ₁₆	22 ³ / ₄	12 ³ / ₈	10	6 ⁵ / ₁₆	4 ⁷ / ₈	4 ¹⁵ / ₁₆	17 ³ / ₄	5 ⁵ / ₈	12 ¹³ / ₁₆	41 ¹⁵ / ₁₆	335
6514-8-B	1 ³ / ₁₆	8 ¹ / ₂	12 ³ / ₈	1 ¹³ / ₁₆	4 ⁵ / ₁₆	24	13 ¹ / ₂	12 ⁷ / ₈	8 ³ / ₁₆	6 ¹¹ / ₁₆	5 ³ / ₁₆	19	5 ⁵ / ₈	12 ¹³ / ₁₆	48 ¹³ / ₁₆	450
6514-9	1 ⁵ / ₁₆	13 ³ / ₈	—	3 ¹³ / ₁₆	6 ³ / ₁₆	28	16	13 ⁷ / ₁₆	11 ⁵ / ₁₆	8 ⁷ / ₁₆	6 ³ / ₁₆	23	5 ⁵ / ₈	14 ¹¹ / ₁₆	57 ¹ / ₂	795
6514-10	1 ⁹ / ₁₆	15 ⁷ / ₁₆	—	4 ³ / ₈	5 ¹⁵ / ₁₆	32 ¹ / ₂	20 ¹ / ₂	13 ⁵ / ₈	13 ¹ / ₁₆	11 ³ / ₁₆	6 ¹¹ / ₁₆	27 ¹ / ₂	1 ¹ / ₂	16 ¹ / ₈	63 ¹³ / ₁₆	1035

Burner designation	6514- /LC,L4,L9 (jacketed tile)					All 6514	
	Dimensions in inches				wt lb	Recommended Sensitrol™ oil valve	Recommended pilot tip
	AA ^②	BB	CC	DD ^⑤			
6514-6	16	3 ⁴ / ₄	8 ³ / ₈	32 ⁵ / ₁₆	215	1813-02-C	4021-12
6514-7	17	3 ⁴ / ₄	9 ³ / ₈	34 ¹ / ₂	250	1813-02-D	4025-0-T
6514-8-A	18 ³ / ₄	3 ⁴ / ₄	12 ¹⁵ / ₁₆	42 ¹ / ₁₆	370	1813-02-D	4025-0-T
6514-8-B	20	3 ⁴ / ₄	12 ¹⁵ / ₁₆	48 ¹⁵ / ₁₆	495	1813-02-D	4025-0-T
6514-9	24 ¹ / ₄	1 ³ / ₁₆	14 ⁷ / ₈	57 ¹¹ / ₁₆	860	1813-01	4025-2-T
6514-10	27 ¹ / ₂	1 ¹ / ₁₆	16 ⁵ / ₁₆	63 ¹³ / ₁₆	1085	1813-01	4025-2-T

- ① A square threaded flange is used for sizes -6, -7, -8. SW style (suitable for slip-on or welded connection) inlet may be ordered as a special option. An SW inlet is standard for -9 and -10 burners.
- ② Opening in furnace shell or outer wall must be 1/2" larger than dimension "AA" to allow for mounting plate fillet and draft.
- ③ Blank boss--This may be ordered as a special option with a 1 1/2" tap suitable for 5025-3-1T Oil Pilot, in which case North American will drill out 1/2" web of refractory left in tile before shipment, and the burner nose will be positioned so none of its holes are in front of that opening. For -10 size, an appropriate 1 1/2" npt half-coupling will be added as a special option.
- ④ 1" fpt for electrode or UV flame detector.
- ⑤ Pipe nipple and optional (recommended) Sensitrol Oil Valve are not included as part of the burner assembly, and must be ordered separately. Dimensions Z and DD assume a 3/8" close nipple between burner and Sensitrol Oil Valve (6514-6 through -8-B) and a 1/2" close nipple between burner and Sensitrol Valve (6514-9 and -10).
- ⑥ Applies when optional SW inlet is specified.
- ⑦ Flanged connection--a standard Fives square threaded flange is used.
- ⑧ Flanged connection--a standard ANSI 125 psi threaded flange is used.
- ⑨ Optional 8773 flex tubing purchased separately from North American.

ANSI or SW flanges: Flat face companion flanges and full face gaskets are supplied with this equipment. Do not use raised face flanges that may damage mating flange.

ORDERING INFORMATION



- Example 1 6514-8-A/LC/1.2A Fireall dual fuel burner complete with carbon steel jacketed tile and 1.2 capacity alloy nose
Example 2 6514-6/BO/1.0H Fireall dual fuel burner only with standard capacity iron nose
Example 3 6514-9/LX/1.2H Fireall dual fuel burner complete with refractory tile and 1.2 capacity iron nose

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

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North American 6514 Dual-Fuel™ Burners Engineering Data

Sheet 6514-1

6514-6 ENGINEERING DATA

Natural Gas with 22 osi Atomizing Air ^①	0.25	1	4	8	16
Max. %XSAir	450	675	90	120	140
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches on ratio, no XSAir	48/12	18/8	36/12	48/12	48/12
at max. XSAir	4/4	4/4	8/6	8/8	12/8
at max. XSFuel	24/6	36/10	54/12	60/24	66/24

Natural Gas with 4 osi Atomizing Air ^②	0.25	1	4	8	16
Max. %XSAir	415	390	450 ^③	230	180
Max. %XSFuel	45 ^③	45 ^③	45 ^③	45 ^③	45
Flame Length/Diameter, inches on ratio, no XSAir	24/12	30/12	48/18	48/18	54/12
at max. XSAir	4/4	6/6	6/6	6/6	4/8
at max. XSFuel	36/12	36/12	60/36	60/24	72/24

Natural Gas without Atomizing Air ^④	0.25	1	4	8	16
Max. %XSAir	470	470	390	280	210
Max. %XSFuel	45 ^③	45	45	45 ^③	45
Flame Length/Diameter, inches on ratio, no XSAir	12/12 ^③	24/12	36/12	36/12	48/18
at max. XSAir	4/4	4/4	6/6	4/4	8/8
at max. XSFuel	12/24	36/18	48/24	60/24	60/24

#2 Oil with 14 osi Atomizing Air ^⑤	0.25	1	4	8	16
Max. %XSAir	30	120	240	240	300
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches on ratio, no XSAir	12/12	12/12	36/18	48/24	60/18
at max. XSAir	8/8	12/12	6/8	8/8	6/8
at max. XSFuel	18/12	36/12	60/24	72/30	72/24

#6 Oil with 22 osi Atomizing Air ^⑥	0.25	1	4	8	16
Max. %XSAir	0	0	60	90	135
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches on ratio, no XSAir	12/12	12/12	36/18	48/24	60/18
at max. XSAir	6/8	6/8	6/8	8/8	6/8
at max. XSFuel	18/12	36/12	60/24	72/30	72/24

(Notes appear on Page 7.)

6514-7 ENGINEERING DATA

Nat'l Gas with 22 osi Atomizing Air ^{⑦⑧}	0.25	1	4	8	16
Max. %XSAir	—	—	100	140	200
Max. %XSFuel	—	—	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	—	—	48/18	60/18	66/24
at max. XSAir	—	—	6/6	12/8	12/8
at max. XSFuel	—	—	72/24	72/24	96/30

Natural Gas with 4 osi Atomizing Air ^⑤	0.25	1	4	8	16
Max. %XSAir	450	450	360	360	360
Max. %XSFuel	45 ^③	45 ^③	45 ^③	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	24/12	36/12	60/18 ^③	60/24 ^③	72/24
at max. XSAir	3/3	3/3	6/6	8/8	8/8
at max. XSFuel	36/24	48/24	60/36	72/36	96/36

Natural Gas without Atomizing Air ^①	0.25	1	4	8	16
Max. %XSAir	200	540	540	540	380
Max. %XSFuel	45 ^③	45	45 ^③	45 ^③	45
Flame Length/Diameter, inches					
on ratio, no XSAir	24/24 ^③	36/24	36/18	60/24	66/24
at max. XSAir	6/6	6/6	6/6	6/6	8/8
at max. XSFuel	24/36	48/24	60/36	72/36	92/30

#2 Oil with 14 osi Atomizing Air ^⑨	0.25	1	4	8	16
Max. %XSAir	135	180	270	270	450
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	12/12	12/12	48/12	66/18	66/18
at max. XSAir	6/6	6/6	6/6	8/8	6/6
at max. XSFuel	18/12	36/12	72/24	84/36	96/18

#6 Oil with 22 osi Atomizing Air ^①	0.25	1	4	8	16
Max. %XSAir	0	50	90	180	200
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	12/12	18/12	48/12	72/18	72/24
at max. XSAir	8/8	8/8	8/8	12/8	12/12
at max. XSFuel	18/12	30/18	72/30	84/30	84/24

6514-8-A ENGINEERING DATA

Natural Gas with 22 osi Atomizing Air ^⑤	0.25	Main Air Pressure, osi			
		1	4	8	16
Max. %XSAir	—	450	500	575	540
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	12/8	48/12	72/18	96/24	108/24
at max. XSAir	—	6/6	8/6	6/6	6/6
at max. XSFuel	48/12	72/18	96/24	120/30	144/36

Natural Gas with 4 osi Atomizing Air ^⑤	0.25	1	4	8	16
Max. %XSAir	450	540	540	540	540
Max. %XSFuel	45	45 ^③	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	24/12	48/24	72/30	96/24	108/24
at max. XSAir	6/6	8/6	8/8	8/8	8/8
at max. XSFuel	48/24	72/36	108/30	108/36	144/36

Natural Gas without Atomizing Air ^⑤	0.25	1	4	8	16
Max. %XSAir	450	450	675	250	110
Max. %XSFuel	45 ^③	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	36/24 ^③	36/24	72/24	60/24	60/24
at max. XSAir	8/8	10/10	8/8	8/10	12/10
at max. XSFuel	36/36	96/36	84/30	96/36	108/36

#2 Oil with 14 osi Atomizing Air ^⑩	0.25	1	4	8	16
Max. %XSAir	30	90	270	360	360 ^⑩
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	24/12	36/12	60/18	84/24	108/30
at max. XSAir	12/8	12/8	12/8	12/12	12/12
at max. XSFuel	24/12	48/18	96/30	120/36	180/36

#6 Oil with 22 osi Atomizing Air ^⑩	0.25	1	4	8	16
Max. %XSAir	0	20	90 ^⑩	100	190
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	12/12	24/12	48/18	60/24	96/30
at max. XSAir	12/12	12/12	12/12	24/12	12/10
at max. XSFuel	36/18	48/18	96/36	108/36	144/36

6514-8-B ENGINEERING DATA

Natural Gas with 22 osi Atomizing Air ^⑦	0.25	Main Air Pressure, osi			
		1	4	8	16
Max. %XSAir	—	35	900	630	475
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	24/18	60/24	84/24	108/30	120/30
at max. XSAir	—	36/24	8/8	8/8	8/8
at max. XSFuel	60/24	84/36	84/36	132/45	156/45

Natural Gas with 4 osi Atomizing Air ^⑩	0.25	1	4	8	16
Max. %XSAir	430	450	1000	1100	1150
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	36/12	60/24	96/30	108/30	108/30
at max. XSAir	8/10	8/8	8/8	8/8	8/8
at max. XSFuel	72/30	84/36	120/45	132/45	132/45

Natural Gas without Atomizing Air ^⑦	0.25	1	4	8	16
Max. %XSAir	350	650	1000	430	290
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	24/24	60/24	72/24	84/24	96/24
at max. XSAir	8/8	8/8	8/8	8/8	8/10
at max. XSFuel	72/30	84/30	96/36	108/36	120/36

#2 Oil with 14 osi Atomizing Air	0.25	1	4	8	16
Max. %XSAir	50	150	400	500	500
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	24/12	36/12	60/18	84/24	108/30
at max. XSAir	12/8	12/8	12/8	12/12	12/12
at max. XSFuel	24/12	48/18	96/30	120/36	180/36

#6 Oil with 22 osi Atomizing Air ^⑩	0.25	1	4	8	16
Max. %XSAir	25	60	250	110	250
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	12/10	24/12	72/24	108/24	144/30
at max. XSAir	8/8	12/8	24/12	8/8	8/8
at max. XSFuel	36/18	60/24	108/36	144/42	192/42

6514-9^① ENGINEERING DATA

Natural Gas with 22 osi Atomizing Air	0.25	Main Air Pressure, osi			
		1	4	8	16
Max. %XSAir	600	490	650	750	840
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	42/24	96/30	132/30	180/36	192/36
at max. XSAir	6/8	6/8	6/8	6/8	6/8
at max. XSFuel	48/36	120/48	168/48	228/60	240/60

Natural Gas with 4 osi Atomizing Air	0.25	1	4	8	16
Max. %XSAir	540	600	820	990	1440
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	72/24	120/30	168/36	180/36	180/36
at max. XSAir	6/8	6/8	6/8	6/8	6/8
at max. XSFuel	96/36	156/48	216/48	228/60	228/60

Natural Gas without Atomizing Air	0.25	1	4	8	16
Max. %XSAir	350	750	1200	1250	1050
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	132/36	144/36	156/36	168/36	180/36
at max. XSAir	6/8	6/8	6/8	6/8	6/8
at max. XSFuel	156/36	168/36	180/48	192/48	204/48

#2 Oil with 14 osi Atomizing Air	0.25	1	4	8	16
Max. %XSAir	100	200	400	600	600
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	48/18	72/18	108/24	144/30	180/36
at max. XSAir	18/12	18/12	18/12	18/18	18/18
at max. XSFuel	72/30	96/36	144/42	192/48	240/48

#6 Oil with 22 osi Atomizing Air	0.25	1	4	8	16
Max. %XSAir	10	60	200	300	190
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	36/12	60/12	108/24	180/36	216/36
at max. XSAir	24/12	12/12	12/12	12/12	24/24
at max. XSFuel	72/30	96/36	144/42	192/48	240/48

6514-10^① ENGINEERING DATA

Natural Gas with 22 osi Atomizing Air	0.25	Main Air Pressure, osi			
		1	4	8	16
Max. %XSAir	50	100	100	200	300
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	48/30	108/36	156/36	192/48	240/48
at max. XSAir	24/12	24/12	24/12	24/12	24/12
at max. XSFuel	60/36	156/48	192/48	240/60	300/60

Natural Gas with 4 osi Atomizing Air	0.25	1	4	8	16
Max. %XSAir	100	100	200	300	400
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	48/30	108/36	156/36	192/48	240/48
at max. XSAir	24/12	24/12	24/12	24/12	24/12
at max. XSFuel	60/36	156/48	192/48	240/60	300/60

Natural Gas without Atomizing Air	0.25	1	4	8	16
Max. %XSAir	75	100	150	250	350
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	72/36	120/36	156/48	192/48	228/48
at max. XSAir	24/12	24/12	24/12	24/12	24/12
at max. XSFuel	84/36	144/36	180/60	216/60	252/60

#2 Oil with 14 osi Atomizing Air	0.25	1	4	8	16
Max. %XSAir	50	100	200	300	400
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	48/30	108/36	156/36	192/48	240/48
at max. XSAir	30/18	30/18	30/18	30/18	30/18
at max. XSFuel	60/36	156/48	192/48	240/60	300/60

#6 Oil with 22 osi Atomizing Air	0.25	1	4	8	16
Max. %XSAir	50	100	200	300	400
Max. %XSFuel	45	45	45	45	45
Flame Length/Diameter, inches					
on ratio, no XSAir	48/30	108/36	156/36	192/48	240/48
at max. XSAir	30/18	30/18	30/18	30/18	30/18
at max. XSFuel	60/36	156/48	192/48	240/60	300/60

NOTES

- ① Maximum main air pressure at which pilot will light main flame is 1 osi for listed conditions.
- ② Maximum conditions at which pilot will light main flame is 1 osi main air pressure and 300% XSAir.
- ③ Flame turns up (lifts) at these conditions.
- ④ Maximum conditions at which pilot will light main flame is 1 osi main air pressure and 400% XSAir.
- ⑤ Pilot will light main flame at all listed main air pressures and at a maximum 200% XSAir.
- ⑥ Pilot will light main flame at a maximum of 2 osi main air pressure with 12 osi air on the pilot mixer.
- ⑦ Maximum main air pressure at which pilot will light main flame is 4 osi for listed conditions.
- ⑧ The burner is unstable below 4 osi main air pressure.
- ⑨ Maximum conditions at which pilot will light main flame is 1 osi main air pressure and 140% XSAir.
- ⑩ Pilot will light main flame at all listed conditions except where an N symbol is used.

Maximum main air pressure at which pilot will light main flame is 8 osi for listed conditions.

Flame Signal: ⑩

The 6514 Burner will generate an adequate signal for flame supervision at all conditions listed except as noted.

Test Conditions: ⑩

All test data was obtained in an open laboratory furnace, with free air available. Because of differing operating conditions in the field, assembly tolerances, and a host of other variables, use reasonable caution in applying this data to actual field situations.

Air pressure on the pilot was 8 osi (except see note 6).

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. Components in combustion systems may exceed 160°F (71°C) surface temperatures and present hot surface contact hazard. Fives North American Combustion, Inc. suggests the use of combustion systems that are in compliance with all Safety Codes, Standards, Regulations and Directives; and care in operation.

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