

North American Dual-Fuel™ Burners for High Temperature Applications

Bulletin 6425

Ref: Bulletin 6422

6425 Burners are designed specifically for higher temperature operations such as forge furnaces, ceramic kilns, metal and glass melters, heat treat furnaces, etc. They are the high temperature version of North American's 6422 Fire-All Burner, one of the most widely used industrial burners in the world.

6425's are particularly appropriate for applications that run at both high and low temperatures--an example is a batch type kiln in which early parts of the cycle run below 1200 F and require free oxygen in kiln atmosphere for raw material to process properly; then frequently the product must "soak" at temperatures above 2000 F. 6425 Burners handle this duty with ease due to their excess air flexibility and their construction that withstands radiant heat.

The standard burner is limited to operation with gaseous fuels and distillate oils. The standard materials of construction are not suitable for operation with heavy oils.

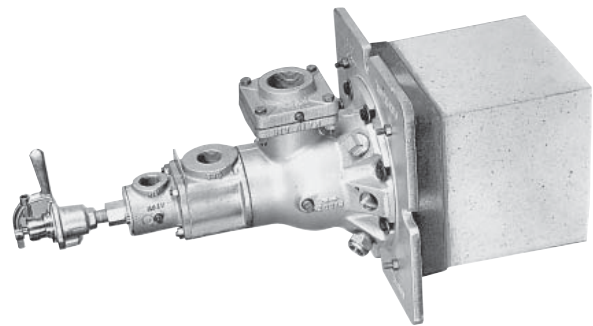
CONSTRUCTION

Metal parts are shielded by refractory: the tile and an insulating refractory "biscuit" covering face of burner. Mounting plate and burner body are made of heat resistant cast iron. Burner tile is 3200 F castable material. Air tubes are high grade alloy.

In furnace chambers above 2000 F, combustion air should not be turned down below 2 psi (with or without fuel on).

HIGH VELOCITY TILES

6425- -MB Burners have a 13½" "Milk Bottle" tile with reduced outlet; they produce higher velocity flames than the standard burner, also offer somewhat better protection for burner internals from furnace radiation. Good tile installation practice is important with any burner (see Supplements DF-M1 and -M2). It is critical with Milk Bottle tiles because of higher pressures developed in the tile, which can cause burner and furnace wall damage if not properly sealed into the wall.



6425 Burner Complete shown with optional (recommended) Sensitrol Oil Valve.

IGNITION/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. All burners should use flame supervision if they operate in combustion chambers that are below 1400 F during at least part of their cycles. Interrupted pilots are required for such installations. For continuous high temperature furnaces and those with 1400 F flame supervision bypass systems, intermittent pilots are sometimes used: These should be turned off in all applications above 2000 F to avoid overheating burner body and mounting.

Table I. TOTAL AIR CAPACITIES*
scfh
(for Btu/hr, multiply by 100)

Burner designation	16 osi air at burner
6425-2	2 600
6425-3	4 100
6425-4	6 300
6425-5	10 300
6425-6	15 700
6425-7-A	27 000
6425-7-B	33 500
6425-8-A	44 800

* Includes combustion and atomizing air.

Table II. MAXIMUM EXCESS AIR RATES in %
(with 9 long tiles, without pilot)

Burner designation	GAS ^② Combustion Air pressure			OIL ^① Combustion Air pressure		
	1 osi	8 osi	14 osi	1 osi	8 osi	14 osi
6425-2	—	380	500	—	380	500
6425-3	330	1000	1300	210	480	670
6425-4	560	1560	1560	480	800	900
6425-5	1070	1440	1150	50	250	400
6425-6	380	1000	1400	140	560	610
6425-7-A	3200	4900	1000	160	330	450
6425-7-B	900	1450	1600	150	700	830
6425-8-A	460	660	400	200	280	350

NOTE: Excess air ratings are based on operation in a cold open furnace.

① 14-16 osi atomizing air.

② It may be necessary to reduce atomizing air pressure to obtain maximum excess air.

Table III. MAIN AIR CAPACITIES
scfh (not including atomizing air)

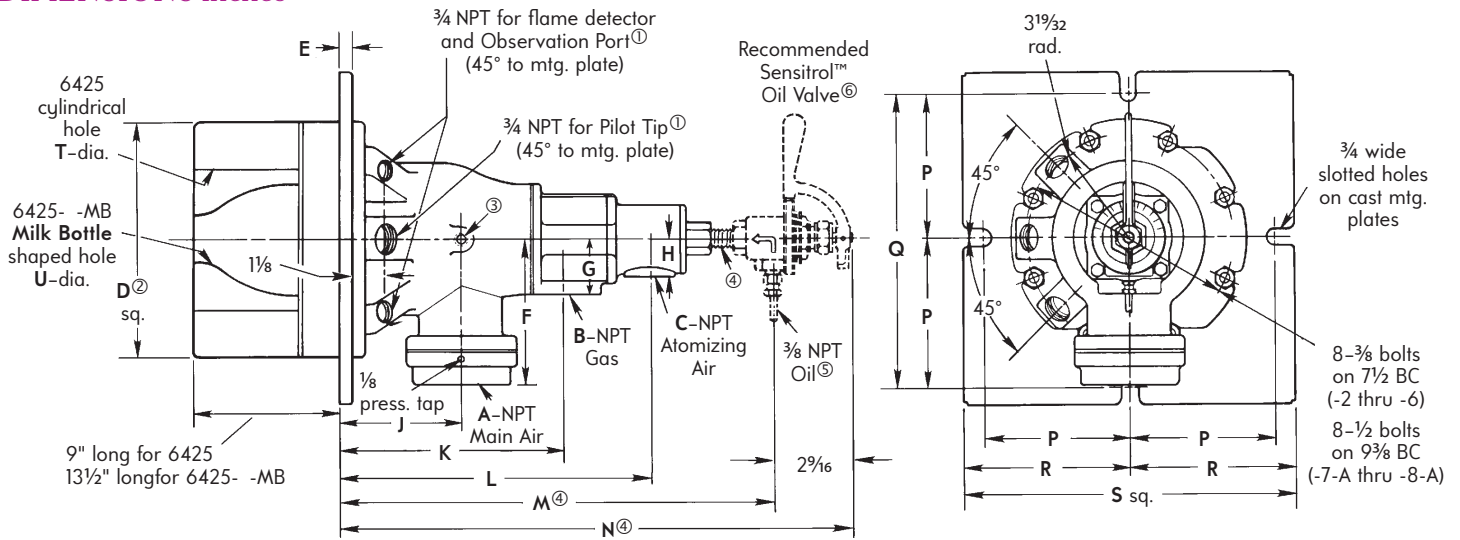
Burner designation	air pressure drop across the burner in osi					
	0.1	1	5	8	12	16
6425-2	160	520	1 160	1 470	1 800	2 100
6425-3	280	890	1 980	2 500	3 050	3 550
6425-4	460	1 450	3 240	4 100	5 000	5 800
6425-5	750	2 370	5 300	6 700	8 150	9 450
6425-6	1180	3 700	8 300	10 500	12 900	14 800
6425-7-A	2070	6 550	14 600	18 500	22 700	26 200
6425-7-B	2580	8 150	18 200	23 000	28 200	32 600
6425-8-A	3320	10 500	23 500	29 700	36 400	42 000

Table IV. ATOMIZING AIR CAPACITIES
scfh

Burner designation	air pressure across burner, osi			
	14	16	18	20
6425-2, -3, -4	500	520	560	600
6425-5	640	690	720	760
6425-6	800	850	910	950
6425-7-A, -7-B	870	930	990	1040
6425-8-A	2650	2840	3000	3170

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.

DIMENSIONS inches



NOTE: For 6425-8-A, the air and gas connections cannot be piped in the same plane, as shown on other side, because the "flower pot" type air connection flange would interfere with the 2 1/2" gas line.

Burner designation	A	B	C	D ³	E	F	G	H	J	K	L	M ⁵	N ⁵
6425-2	1 1/4	1	3/4	8 1/2	1/2	5 1/4	2	1 3/8	4 3/8	8 3/8	11 5/16	15 13/16	18 3/8
6425-3	1 1/2	1	3/4	8 1/2	1/2	5 1/4	2	1 3/8	4 3/8	8 3/8	11 5/16	15 13/16	18 3/8
6425-4	2	1 1/4	3/4	8 1/2	1/2	5 1/4	2	1 3/8	4 3/8	8 3/8	11 5/16	15 13/16	18 3/8
6425-5	2 1/2	1 1/2	1	8 1/2	1/2	5 1/4	2	1 3/8	4 3/8	8 3/8	11 5/16	15 13/16	18 3/8
6425-6	3	1 1/2	1	8 1/2	1/2	5 5/16	2	1 3/8	4 3/8	8 3/8	11 5/16	15 13/16	18 3/8
6425-7-A	4	2 1/2	1 1/4	10	9/16	6 15/16	2 5/8	2 1/8	5 7/8	11	15 1/8	20 1/16	22 5/8
6425-7-B	4	2 1/2	1 1/4	10	9/16	6 15/16	2 5/8	2 1/8	5 7/8	11	15 1/8	20 1/16	22 5/8
6425-8-A	6	2 1/2	2	10	9/16	10 11/16	2 5/8	1 3/4	5 7/8	11	15 1/8	20 1/16	22 5/8

Burner designation	P	Q	R	S	T	U	wt, in lb	Recommended Sensitrol™ Oil Valve	approx. flame lengths* with 16 psi Main Air (in open furnace)	
									gas	oil
6425-2	5 1/4	10 1/2	6	12	5	3	83	1813-02-A	1/2'	1 1/2'
6425-3	5 1/4	10 1/2	6	12	5	3	83	1813-02-A	1 1/2'	2'
6425-4	5 1/4	10 1/2	6	12	5	3	83	1813-02-A	2'	2 1/2'
6425-5	5 1/4	10 1/2	6	12	5	3	83	1813-02-A	2 1/2'	3'
6425-6	5 1/4	10 1/2	6	12	5	3	83	1813-02-B	3'	4'
6425-7-A	6 1/8	12 1/4	6 3/4	13 1/2	7	4 1/2	139	1813-02-C	5'	6'
6425-7-B	6 1/8	12 1/4	6 3/4	13 1/2	7	4 1/2	139	1813-02-C	6'	6'
6425-8-A	6 1/8	12 1/4	6 3/4	13 1/2	7	-	145	1813-02-D	7'	7'

All burners use 4011-11 or 4011-12 Pilot Tips.
6425- -MB Burners have a 1/16" gasket between mounting plate and burner body.

* 6425 Burners with standard tiles

- Pilot, flame detector, and Observation Port positions are interchangeable as long as Pilot and flame detector are in adjacent holes.
- Opening in furnace shell should be about 1/2" larger than dimension D to allow for fillets and draft on mounting plate.
- 1/4" air pressure tap on -2, -3, -4, -5 and -6.
- Dimensions M and N assume use of a 3/8" close nipple (not furnished by North American) between burner and Sensitrol™ Valve.
- Metal tubing is available as an extra cost option (order as PN 3-0310-7).
- Optional (recommended) Sensitrol Oil Valve is not included as part of the burner assembly, and must be ordered separately.

Tiles for 6425 Burners

Burner designation	Standard 70% alumina PN	Milk Bottle 80% alumina PN
6425-2 thru -6	4-2121-2	OC4-2332-1
6425-7A, -7B, -8A	4-2142-2	OC4-2547-2

All tiles end use limit temperature is 3200 F.



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