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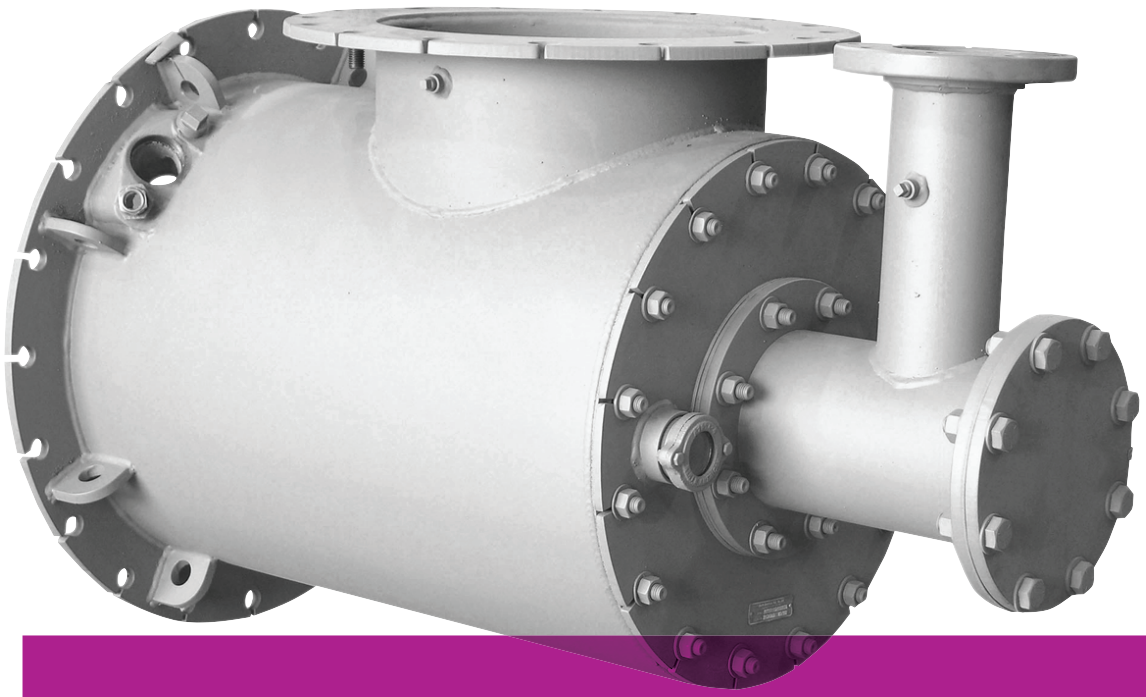
PROCESS TECHNOLOGIES

ENERGY | COMBUSTION

North American
Magna-Flame™ Burners, Wide Flame



4796 Magna-Flame™ Burner

- For furnaces, boilers, air heaters, incinerators, gypsum kettles, etc.
- Ultra-low NOx <30ppm, when operated with Flue Gas Recirculation
- Gas-only burner
- Short and wide flame pattern
- 18 to 75 million Btu/h HHV
- Broad stability range
- Chambers up to 2200°F

Product Overview | 4796 Magna-Flame™

4796 Magna-Flame™ Gas Burners are designed to fire in combustion chambers that have a limited length and sufficient width to allow the flame envelope to develop. Operation is quiet and the flame is tile-stable. The 4796 Magna-Flame™ is stable at full capacity from rich air/fuel ratios up to 150% excess air. The burner can be used in cold, sealed-in combustion chambers.

Available air connection sizes range from 12" through 24" which permits the use of a single burner, rather than multiple burners, to obtain the desired input in a chamber of limited length.

LOW NOx OPERATION. The 4796 Magna-Flame™ burner produces about 10% lower NOx emissions than conventional gas burners. The same high swirl that creates a short bushy flame also pulls furnace gases into the flame's primary reaction zone to reduce NOx formation.

This rapid mix design creates an exceptionally stable flame and makes the burner an excellent platform for flue gas recirculation (FGR). When operated with 15-20% FGR the combustion system will produce less than 30ppm NOx in most applications.

CONTROL. Mass flow control systems are normally used with 4796 Burners, especially in the larger sizes. Cross-connected regulator systems can also be used because the required gas pressure is approximately 0.6 times the air pressure.

CONSTRUCTION. The body is fabricated using heavy duty welded steel featuring a round mounting flange, a refractory ring and an alloy air spin vane in the front. Connections for pilot and flame detector can be factory-installed in any of several locations per customer specification.

The 4796 Magna-Flame burner is offered with the following options:

- Fuel Tube Material
  - Carbon Steel (standard prior to April 2020)
  - 316sst
- Main Air Spin Vane Angle
  - 45° (standard prior to April 2020), typically combined with a 30° tile (60° included angle)
  - 30° typically combined with a 20° tile (40° incluced angle)

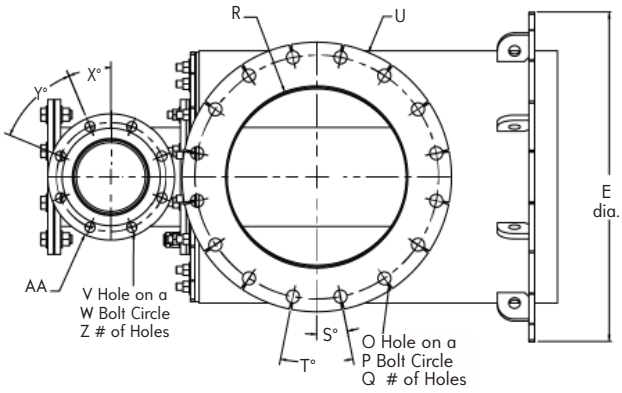
The reduced vane will decrease flame diameter and increase flame length. See flame dimensions in the table below. See burner dimensions on page 3.

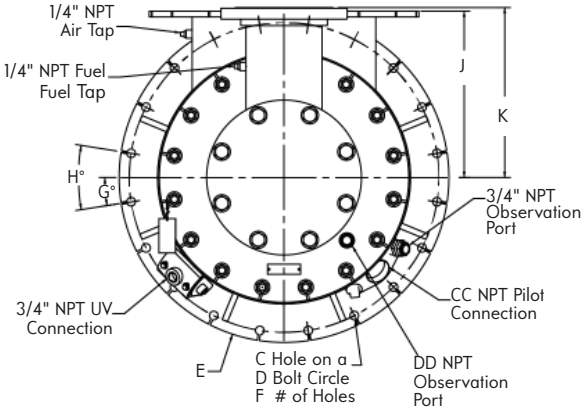
PILOT and FLAME SUPERVISION. Magna-Flame™ burners should be pilot ignited①. The 4014 gas-boosted pilot (sold separately) listed in the dimension table is required, and provision must be made for low fire start with 1.0"w.c. or less main air. The pilot must be of the interrupted type to prevent overheating of the mounting. The UV detector location should be 90° clockwise of the pilot when viewing the rear of burner (in the direction of air swirl). Self-checking UV scanners (sold separately) are recommended for flame supervision. See Bulletin 8832 for selection of UV adapters. It is possible for a UV scanner mounted on this burner to sight flame(s) of other burners in the same firing chamber. Consult Fives North American Combustion, Inc. for configuration guidance on multiple burner applications.

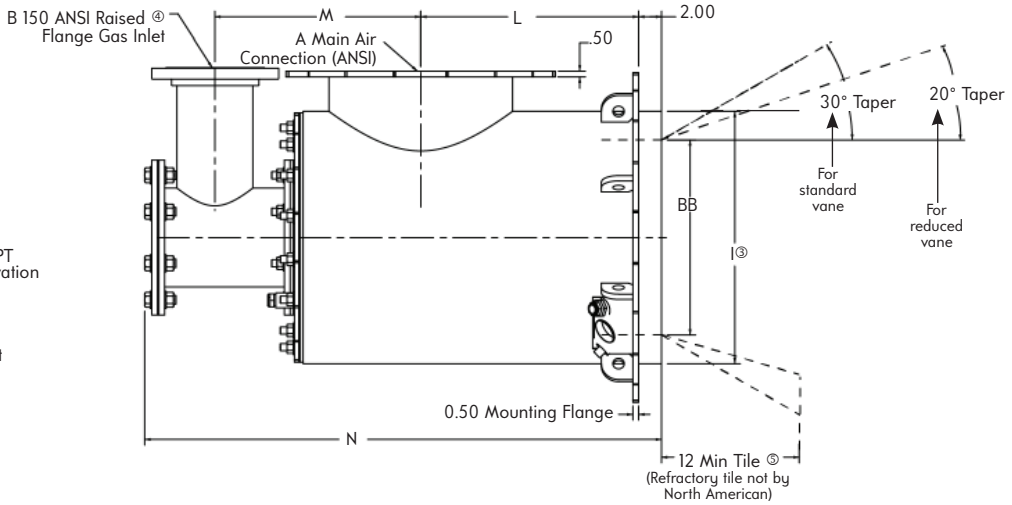
Burner Designation	Combustion Air Capacities (scfh) Multiply by 100 to get Btu per hour. Air pressure drop across the burner, osi				Maximum % excess air. Air pressure in osi			Flame Dimensions @ 8 osi main air							
								10% XSA				40% XSA			
								45° vane angle		30° vane angle		45° vane angle		30° vane angle	
	1.0	5.0	6.0	8.0②	0.2	4.0	8.0	L	Dia.	L	Dia.	L	Dia.	L	Dia.
4796-12	67 000	150 000	164 000	190 000	500	200	150	6′	5′	8′	4′	4½′	4′	6′	3½′
4796-14	86 000	193 000	211 000	244 000	500	200	150	7′	6′	9½′	5′	5′	5′	6½′	4′
4796-16	120 000	269 000	295 000	340 000	500	200	150	7½′	6′	10′	5′	5½′	5′	7′	4′
4796-18	155 000	346 000	380 000	438 000	500	200	150	8′	6′	10½′	5′	6′	5′	7½′	4′
4796-20	200 000	447 000	490 000	565 000	500	200	150	9′	7′	12′	6′	6½′	5½′	8½′	4½′
4796-22	237 000	530 000	580 000	670 000	500	200	150	9½′	8′	13′	6½′	7′	6½′	9′	5′
4796-24	282 000	630 000	690 000	795 000	500	200	150	10′	8′	13½′	6½′	7′	6½′	9½′	5′

① Because of a positive pressure in the burner, it is difficult to light with a torch unless the air is turned very low and a strong pressure torch is used.
② Maximum recommended pressure.

Dimensions | 4796 Magna-Flame™







Burner Designation	Dimensions in inches and degrees																	
	A	B	C	D	E	F	G°	H°	I③	J	K	L	M	N	O	P	Q	R
4796-12	12	4	0.75	24.25	26	16	11.25	22.5	18	12.5	14.75	15	14.44	36.75	1	17	12	12.25
4796-14	14	6	0.75	25.25	27	16	11.25	22.5	20	13.5	14.81	18	17.38	43.38	1.13	18.75	12	13.88
4796-16	16	6	0.75	27	28.75	20	9	18	22	14.5	14.81	19	18.38	45	1.13	21.25	16	15.88
4796-18	18	6	0.75	29	30.75	20	9	18	24	15.5	14.81	19.5	18.88	45.88	1.25	22.75	16	17.88
4796-20	20	8	0.75	31	32.75	20	9	18	26	16.5	14	19.63	21.13	50	1.25	25	20	19.88
4796-22	22	8	0.88	33.5	35.25	24	9	18	28	17.5	14	21	21.88	52.13	1.25	26	20	21.88
4796-24	24	8	0.88	35.5	37.75	24	7.5	15	30	18.5	14	22	24.38	56.13	1.38	29.5	20	23.88

Burner Designation	S°	T°	U	V	W	X°	Y°	Z	AA	BB	CC	DD	Recommended Pilot Ass'y Designation	Wt. lbs.
4796-12	15	30	19	0.75	7.5	22.5	45	8	9	12.5	1.5	¾	4014-2-T	325
4796-14	15	30	21	0.88	9.5	22.5	45	8	11	14.75	2	¾	4014-3-AT	430
4796-16	11.25	22.5	23.5	0.88	9.5	22.5	45	8	11	17	2	¾	4014-3-AT	480
4796-18	11.25	22.5	25	0.88	9.5	22.5	45	8	11	19.25	2	2	4014-3-AT	530
4796-20	9	18	27.5	0.88	11.75	22.5	45	8	13.5	21.5	2	2	4014-3-BT	620
4796-22	9	18	29.5	0.88	11.75	22.5	45	8	13.5	24	2	2	4014-3-BT	675
4796-24	9	18	32	0.88	11.75	22.5	45	8	13.5	26	2	2	4014-3-BT	745

③ Furnace opening should be ½" larger than dimension I for sizes -12 through -16 and ¾" larger than dimension I for sizes -18 through -24.
④ Flat face ANSI flange available upon request.
⑤ For tiles longer than 15" consult Fives North American Combustion.

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.

INSTALLATION. The burner does not include a refractory tile. The shape shown on the dimension drawing (page 3) must be built into the combustion chamber wall. See Supplement DF-M1 for installation recommendations. Consult Fives North American Combustion, Inc. for unique or challenging installation or operational applications.

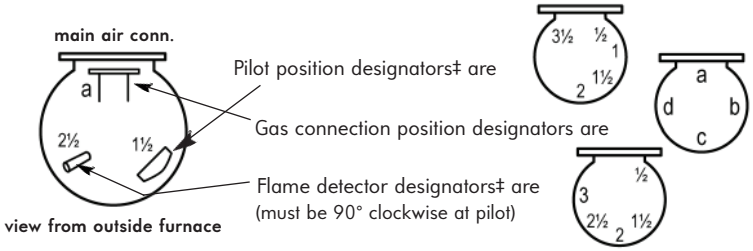
REPLACEMENT and SPARE PARTS. **NOTE: The 4796 burner has gone through several changes:**

— June 2009
- Mounting flange changed from square to round
- Threaded gas connection changed to flanged gas tee

— April 2020
- Offer fuel tube in both carbon steel and 316sst (previously, only offered in carbon steel)
- Offer main air vane assembly in 45° and 30° (previously, only offered in 45°)

When replacing burners, or ordering parts, please inform your sales professional of the complete part number, sales order and/or manufactured date. This information is stamped on a tag located on the burner back plate.

ARRANGEMENT



Arrangement Designators are specified relative to the main air connection at 12 o'clock and should be listed for **pilot, gas connection, and flame detector in that order.**

‡ Good practice dictates that neither pilot nor flame detector be below the centerline of a horizontally-mounted burner.

ORDER MUST SPECIFY: (1) Burner designation (such as 4796-16): (2) Arrangement designation for pilot, gas connection and flame safety positions in that order such as: 4796-16, arrangement 1½ a 2½ (for the arrangement shown above): (3) Fuel tube material (standard carbon steel or 316sst). (4) Main air vane construction (standard 45° angle or reduced 30° angle).

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