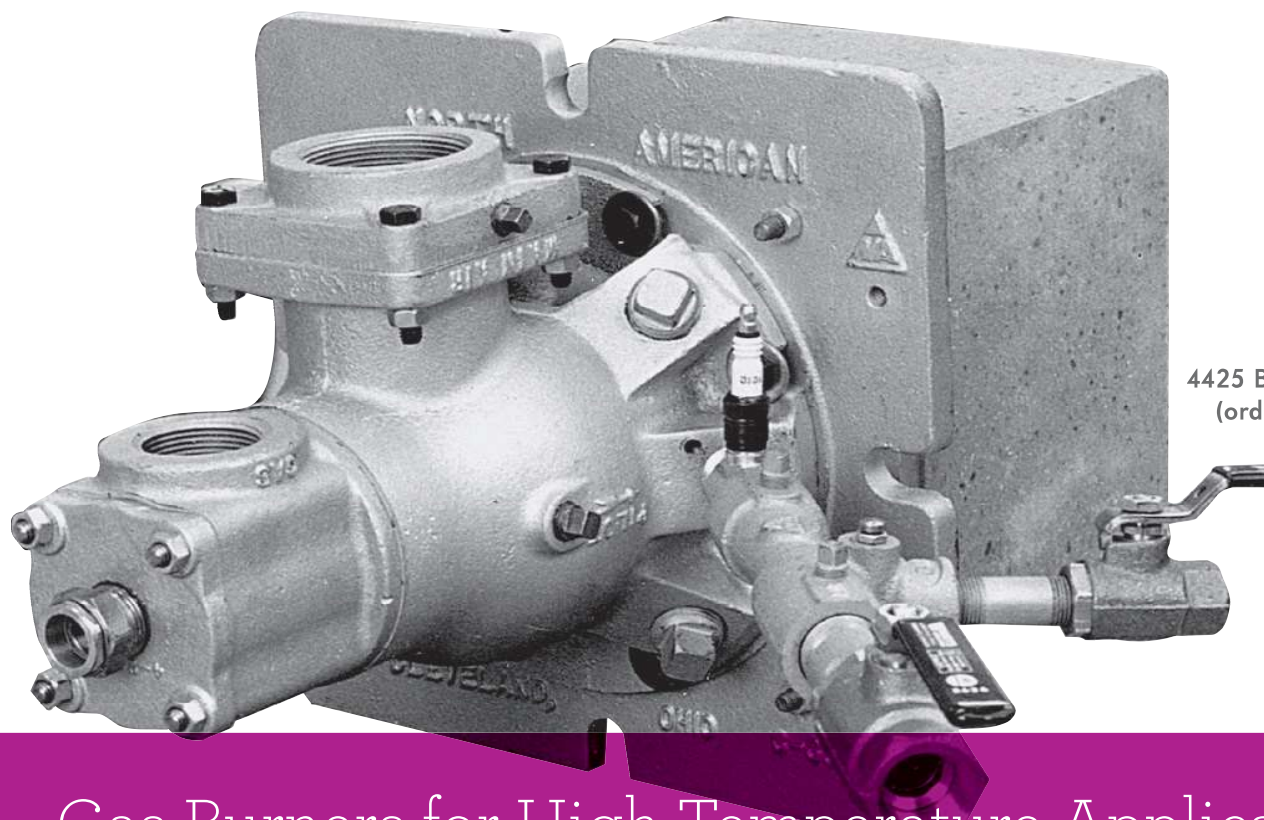


Fire•All™ Gas Burner North American 4425



4425 Burner with pilot set
(ordered separately).

Gas Burners for High Temperature Applications

- Burners are designed specifically for higher temperatures
- Used for forge furnaces, ceramic kilns metal and glass melters
- Higher temperature version of the 4422 Fire•All™

Product Overview | 4425 Fire•All™

4425 Fire•All™ 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 4422 Fire•All™ Burner, one of the most widely used industrial burners in the world.

4425'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. 4425 Burners handle this duty with ease due to their excess air flexibility and their construction that withstands radiant heat.

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. Air tubes are high grade alloy.

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

LIGHTING AND FLAME SUPERVISION

A 4011 Pilot Set is normally used to light 4425 Burners. A manual torch can be used in some applications. The burner can be direct spark ignited with either the 4055 Direct Spark Igniter (4055-D for 4425-2 through -6 and 4055-B for 4425-7 and -8 sizes) or the 4051-D Air Assisted Igniter. The 4051 Air Assisted Igniter is recommended because it ignites the burners over a wider operating range. If using direct spark ignition of main flame, use standard 6000 volt transformer. Half-wave ignition transformers can be used only with the 4055.

A flame rod or ultraviolet (UV) detector can be installed in one of three holes in the body, using an adapter listed in Bulletin 8832. UV scanners allow ignition with up to 14 osi main air. If flame rods are used, 4425-2 through -6 Burners must be ignited at 1 osi or more main air. Do not apply flame rods to -7 and -8 size burners. When using flame supervision, an interrupted pilot is required--do not use constant or intermittent pilots.

Startup and Adjustment: Refer to Bulletin GB-M1 for startup and adjustment of a nozzle-mix burner with ratio regulator air/fuel ratio control.

HIGH VELOCITY TILES

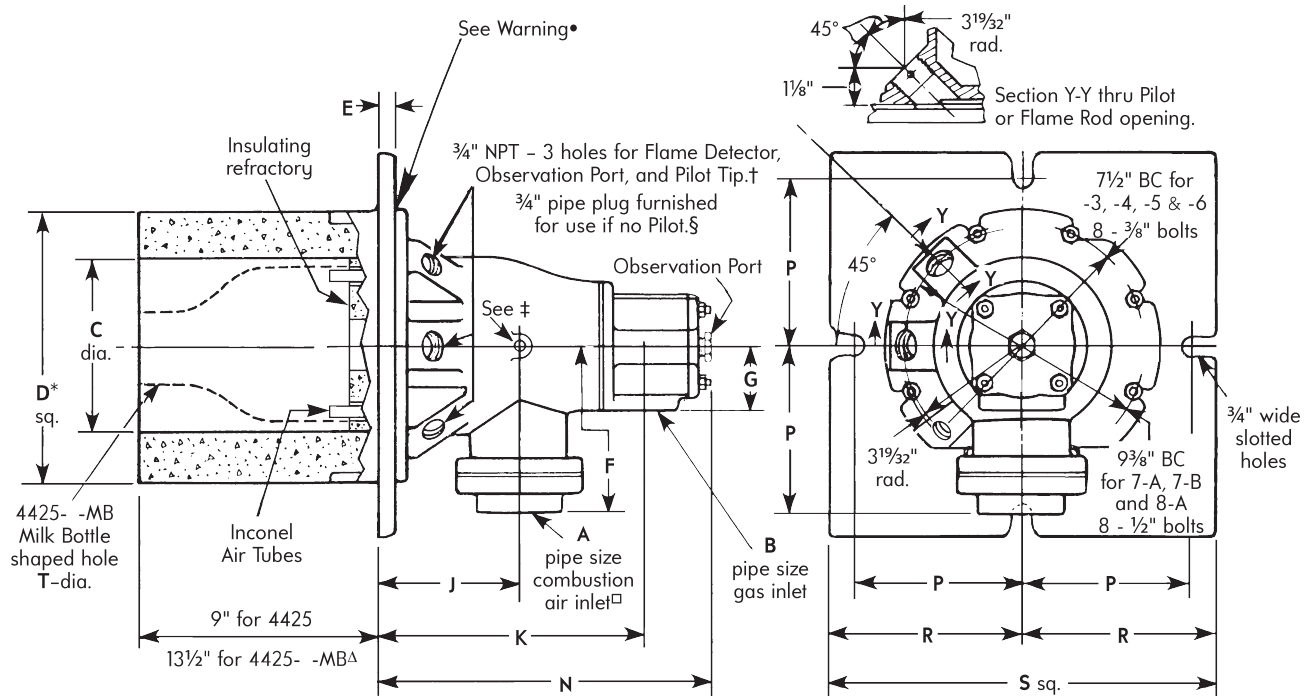
4425- -MB Burners have a 13½" "Milk Bottle" tile with reduced outlet; they produce higher velocity flames than the standard burner, also offer somewhat better protection for burner internals from furnace radiation. Good tile installation practice is important with any burner (see Supplements DF-M1 and -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.

Burner designation	Maximum % excess air			
	Air pressure across burner in osi			
	1	4	8	16
4425-2	850	1750	860	1250
4425-3	1500	2000	1780	1675
4425-4	1400	1500	1100	1500
4425-5	620	570	490	460
4425-6	730	1080	730	410
4425-6-B	1030	850	630	450
4425-7-A	2000	4000	1000	450
4425-7-B	2700	1200	875	500
4425-8-A	2000	2460	2210	1350

Burner designation	Combustion air capacities in scfh (for Btu/h HHV, multiply by 100)							Approx. flame lengths with 16 osi main air (in open furnace)
	Air pressure across the burner in osi							
	0.1	1	5	6	8	12	16	
4425-2	160	520	1160	1270	1470	1800	2100	1'
4425-3	280	890	1980	2160	2500	3050	3550	1½'
4425-4	460	1450	3240	3540	4100	5000	5800	2'
4425-5	750	2370	5300	5800	6700	8150	9450	3'
4425-6	1180	3700	8300	9100	10500	12900	14800	3'
4425-6-B	1330	4200	9400	10300	11900	14500	16900	4'
4425-7-A	2070	6550	14600	16000	18500	22700	26200	6'
4425-7-B	2550	8150	18200	19900	23000	28200	32600	6'
4425-8-A	3350	10600	23700	26000	30000	36700	42400	7'

All ratings are based on operation without pilot in a cold open furnace. Burners can be lighted at any of the ratings listed. If a thicker refractory "biscuit" is used for higher temperature service, excess air limits are lower.

Dimensions | 4425 Fire•All™



NOTE: For 4425-8-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	dimensions in inches														Wt, lb	Recommended Pilot Set
	A	B	C	D	E	F	G	J	K	N	P	R	S	T		
4425-2	1 1/4	1	5	8 1/2	1/2	5 1/4	2	4 3/8	8 3/8	10 5/8	5 1/4	6	12	3	76	4011-11 or 4011-12
4425-3	1 1/2	1	5	8 1/2	1/2	5 1/4	2	4 3/8	8 3/8	10 5/8	5 1/4	6	12	3	76	
4425-4	2	1 1/4	5	8 1/2	1/2	5 1/4	2	4 3/8	8 3/8	10 5/8	5 1/4	6	12	3	76	
4425-5	2 1/2	1 1/2	5	8 1/2	1/2	5 1/4	2	4 3/8	8 3/8	10 5/8	5 1/4	6	12	3	76	
4425-6	3	1 1/2	5	8 1/2	1/2	5 9/16	2	4 3/8	8 3/8	10 5/8	5 1/4	6	12	3	76	
4425-6-B	3	1 1/2	5	8 1/2	1/2	5 9/16	2	4 3/8	8 3/8	10 5/8	5 1/4	6	12	3	76	
4425-7-A	4	2 1/2	7	10	9/16	6 15/16	2 5/8	5 7/8	11	14 1/16	6 1/8	6 3/4	13 1/2	4 1/2	130	4011-11 or 4011-12
4425-7-B	4	2 1/2	7	10	9/16	6 15/16	2 5/8	5 7/8	11	14 1/16	6 1/8	6 3/4	13 1/2	4 1/2	130	
4425-8-A	6□	2 1/2	7	10	9/16	10 11/16□	2 5/8	5 7/8	11	14 1/16	6 1/8	6 3/4	13 1/2	—	139	

* Opening in furnace shell or outer wall must be 1/2" larger than dimension "D" to allow for mounting plate fillet and draft.

• **Warning:** Mounting plate and tile can be separated from burner body for convenience during furnace construction; but for -2 through -6 sizes, tile must be set in wall with notches for pilot and flame rod in proper position relative to desired air pipe direction.

† Pilot, Flame Detector, and Observation Port positions are interchangeable as long as Pilot and Flame Detector are in adjacent holes.

‡ 1/4" air pressure tap on -2, -3, -4, -5 and -6. 1/8" air pressure tap on -7-A, -7-B and -8-A.

□ "Flower pot" type flange for -8-A. Note larger F dimension.

§ For 4425- -MB Burners, a second observation port is substituted for the Pipe Plug.

Δ The milk bottle tile is not offered with the 4425-8-A Burner.

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.

Tiles for 4425 Burners

Burner designation	Standard	PN	Milk Bottle*	PN
4425-2 thru -6-B	70% Alumina	4-2121-2	80% Alumina	OC4-2332-1
4425-7-A, -7-B, -8-A	70% Alumina	4-2142-2	80% Alumina	OC4-2547-2

* All tiles are pre-fired.

Maximum recommended use limit temperature is 3200°F for all tiles.

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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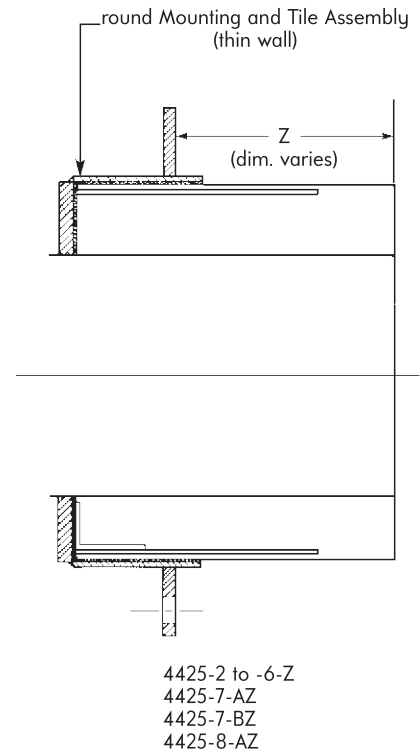
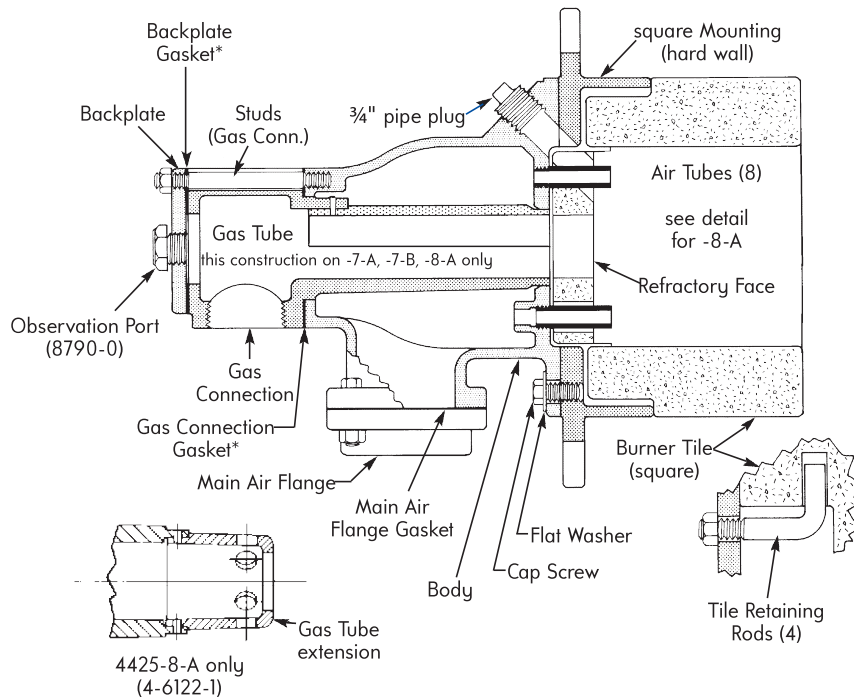
Fives North American Combustion, Inc.
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Industry can do it

North American 4425 Gas Burners

Parts List & Instructions 4425



PARTS for 4425 Gas Burners

part name	4425-2	4425-3	4425-4	4425-5	4425-6	4425-7-A	4425-7-B	4425-8-A
Air Tubes (8 req'd), Inconel	3-3643-1†	3-3643-2†	3-3640-2	3-3639-2	3-3554-2	3-3273-3	3-3273-4	4-3684-2
Backplate	4-2459-2	4-2459-2	4-2459-2	4-2459-2	4-2459-2	3-3269-2	3-3269-2	3-3269-2
Backplate Gasket	3-2607-1	3-2607-1	3-2607-1	3-2607-1	3-2607-1	3-3272-1	3-3272-1	3-3272-1
Body	3-2466-9	3-2466-9	3-2466-9	3-2466-9	3-2466-10	3-3267-3	3-3267-3	3-3267-4
Burner Tile (9") [hard wall]	4-2121-2	4-2121-2	4-2121-2	4-2121-2	4-2121-2	4-2142-2	4-2142-2	4-2142-2
Cap Screw (8 req'd)	R066-2920-H	R-066-2920-H	R066-2920-H	R066-2920-H	R066-2920-H	R066-3420-H	R066-3420-H	R066-3420-H
Flat Washer (8 req'd)	R970-7300-C	R970-7300-C	R970-7300-C	R970-7300-C	R970-7300-C	R970-7370-C	R970-7370-C	R970-7370-C
Gas Connection	3-2465-4	3-2465-4	3-2465-5	3-2465-6	3-2465-6	3-3268-2‡	3-3268-2‡	4-6126-1‡
Gas Connection Gasket	3-2473-1	3-2473-1	3-2473-1	3-2473-1	3-2473-1	3-3272-1	3-3272-1	3-3272-1
Gas Tube	3-2468-2	3-2468-2	3-2468-2	3-2468-2	3-2468-2	—†	—†	—†
Gas Conn. Gasket	3-2473-1	3-2473-1	3-2473-1	3-2473-1	3-2473-1	3-2473-1	3-3272-1	3-3272-1
Main Air Flange	3-2544-2	3-2544-1	4-1695-2	4-1695-3	4-1695-9	4-1695-5	4-1695-5	8765-8 x 7-D
Main Air Flange Gasket	4-5371-2	4-5371-2	4-5371-2	4-5371-2	4-5371-2	4-5371-3	4-5371-3	4-5371-3
Mounting (hard wall)	3-3257-1	3-3257-1	3-3257-1	3-3257-1	3-3257-1	3-3270-1	3-3270-1	3-3270-1
Mounting & Tile Assembly (thin wall)*	3-6322-1/X.X	3-6322-1/X.X	3-6322-1/X.X	3-6322-1/X.X	3-6322-1/X.X	3-6322-2/X.X	3-6322-2/X.X	3-6322-2/X.X
Refractory Face	4-4038-3	4-4038-3	4-4038-3	4-4038-3	4-4038-4	4-4039-2	4-4039-2	4-6127-1
Studs, Gas Conn. (4 req'd)	3-2584-1	3-2584-1	3-2584-1	3-2584-1	3-2584-1	3-3325-1	3-3325-1	3-3325-1
Tile Retaining Rods (4 req'd)	3-1115-2	3-1115-2	3-1115-2	3-1115-2	3-1115-2	3-1115-2	3-1115-2	3-1115-2

* Backplate and Gas Connection Gaskets are identical pieces for -7 and -8 sizes.

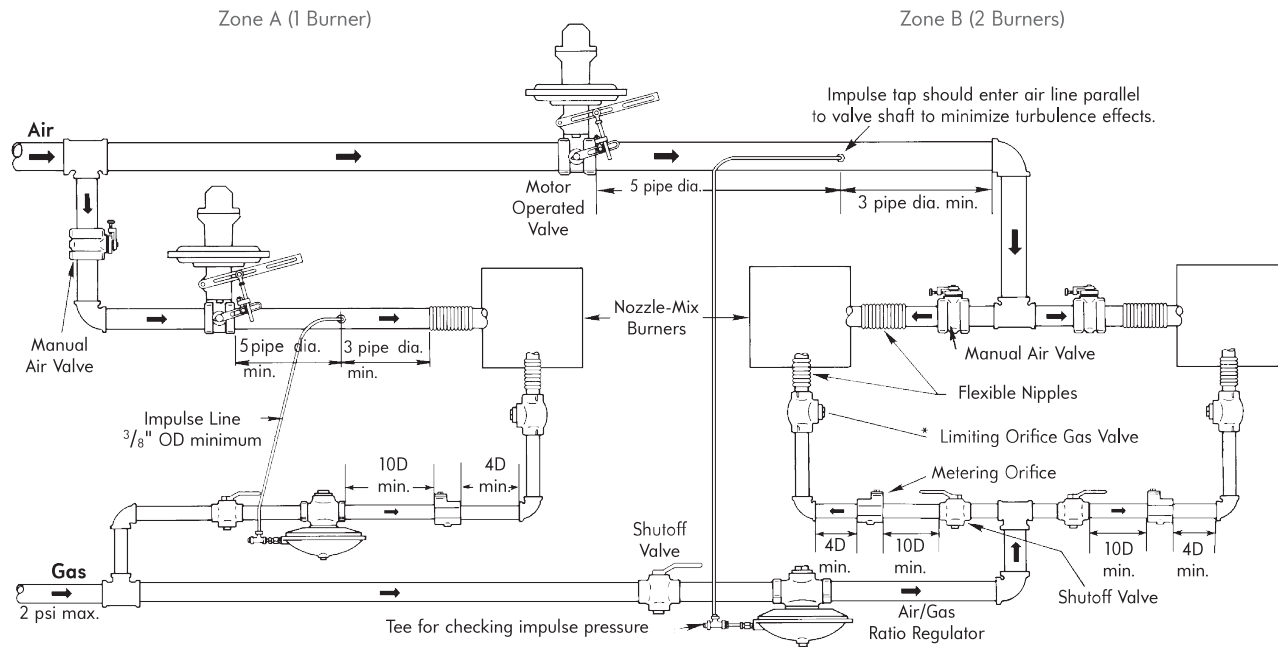
† Includes 3-3638-1 adapter.

‡ Gas tube is cast with Gas Connection for -7-A, -7-B, and -8-A sizes.

• Mounting and tile assembly part numbers have been revised to include the required "Z" dimension. When ordering tile and mounting assembly separately, include the "X.X" suffix to represent "Z" dimension in .5" increments, 2" min. to 9" max.

For example: 3-6322-1/5.5 represents tile and mounting assembly for 4425-2-Z through 4425-6-Z burners with "Z" dimension of 5.5".

suggested piping



* Limiting orifice gas valves must be mounted as close to the burner as possible.

INSTALLATION

To minimize leaks around tile and to prevent cracking of tile by thermal expansion in the wall, see Supplements DF-M1 (for hard refractory lined furnaces) and DF-M2 (for fiber lined furnaces) for installation recommendations.

LIGHTING AND ADJUSTMENT

1. Make sure all fuel shutoff valves are closed. Close limiting orifice gas valves on initial lighting. Open furnace doors and flue dampers.
2. Start blower and check direction of blower rotation. Monitor motor amperage during initial starting and adjustment periods.
3. Open manual and motorized combustion air valves wide to purge furnace.
4. Adjust motorized valve linkage for desired high and low fire.
5. When furnace is purged of all combustion gases and vapors, turn air control valves back to low fire position, leaving individual burner air valves wide open. Light pilots in accord with pilot instructions.
6. Use a screwdriver to open the limiting orifice valve 3-4 turns (counterclockwise). Open gas shutoff valve. If burner does not light within a few seconds, close shutoff valve. Open limiting orifice 1-2 more turns. Purge furnace again.
Open gas shutoff valve. Repeat procedure until flame lights. Adjust as needed while slowly turning motorized air valve to high fire.

7. Make final limiting orifice valve setting by reading high fire gas flow across metering orifice and comparing it to catalog air flow through burner at indicated inlet pressure. Replace cover on limiting orifice gas valve.
8. To adjust burner for low fire, return motorized air valve to low fire without changing limiting orifice gas valve setting; then adjust ratio regulator for desired flame (see Instructions 7218).
9. If other burners are supplied by the same ratio regulator, settings for their limiting orifice valves can be approximated by counting the number of turns the adjusting screw on the first valve (step 6) was opened.
10. Turn all burners to high fire and, if necessary, readjust limiting orifice gas valves.
11. Turn all burners back to low fire, and if necessary, readjust the regulator spring as in step 8.

If flame supervision is used, refer to Bulletin 8832 and Supplement 8832-1.

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