



**BENEFITS**

Better temperature uniformity--prevent one end of furnace from getting to hot while the other end is too cold.

More production speed--allow continuous heating at full firing rate. Instead of cutting back the heat when one end gets hotter, you simply *move the heat* to the other end.

**USES**

Large combustion chambers fired from one end or side--particularly those where one end tends to run cold and the other end hot, such as:

- |                     |                         |
|---------------------|-------------------------|
| Air Furnaces        | Large Batch Furnaces    |
| Annealing Furnaces  | Reverberatory Furnaces  |
| Malleablizing Ovens | Rotary Kilns and Dryers |

**FOUR MODES OF CONTROL**

Variable Heat Pattern Burners can be adjusted for any combination of the following eight conditions:

Heat input	Air/Fuel ratio	Heat pattern	Radiant power
high	rich	long narrow	luminous
low	lean	short wide	clear

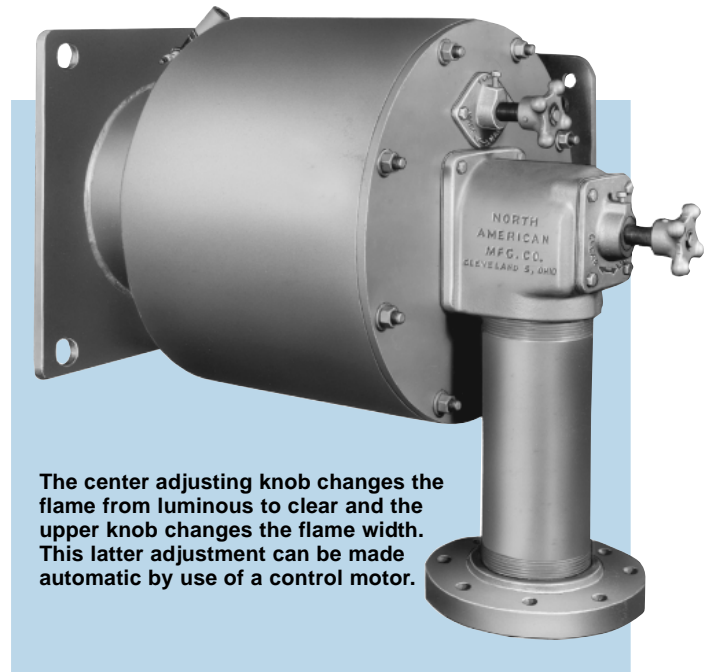
**HOW IT WORKS**

The Variable Heat Pattern Burner has two independent moveable internal assemblies. It differs from previous burners in these important respects:

The burner changes the air directions--not just the gas direction--thus affording an adjustment for *flame width* as well as *flame length*.

It changes the *heat release pattern*--not just the visible flame pattern. Laboratory tests and field experience show more heat released near the burner with a wide flame than with a narrow flame--even though both are clear or both are luminous.

Heat pattern and heat input can be varied independently, providing countless combinations. All modes of control are virtually unaffected by one another. Stability is maintained over a wide range of air/fuel ratios. For gas operation with light oil standby 6808 Burners are suggested--they require 22 osi atomizing air.



The center adjusting knob changes the flame from luminous to clear and the upper knob changes the flame width. This latter adjustment can be made automatic by use of a control motor.

**MANUAL OPERATION**

Manual operation of the burner gives uniformity despite unpredictable or variable conditions.

Don't take a chance when in doubt as to whether a new furnace should have narrow or wide flame for best temperature uniformity. Try both with Variable Heat Pattern Burner, or select the best in-between combination. There is no need to build a second furnace to complete the experiment for your particular conditions--just make on-site adjustments. After the best heat pattern is set, the input is still adjustable.

If load conditions change later, the Variable Heat Pattern Burner can be re-adjusted for a new heat release pattern.

The 4808 Burner is usable with a manual or automatic input control and with the following types of air/fuel ratio control: pressure balanced (cross-connected governor) or mass flow (such as North American's microprocessor based combustion controllers).

Burner designation	Air pipe size	Capacity† with 3 osi air pressure		Capacity† with 6 osi air pressure	
		Btu/hr	scfh	Btu/hr	scfh
4808-9	8"	7 600 000	76 000	10 800 000	108 000
4808-10	10"	9 000 000	92 000	13 000 000	130 000
4808-12	12"	13 200 000	132 000	18 700 000	187 000

† Capacities are about 20% less with short wide pattern.

**WARNING:** Situations dangerous to personnel and property can develop from incorrect operation of combustion equipment. North American urges compliance with National Safety Standards and Insurance Underwriters recommendations, and care in operation.

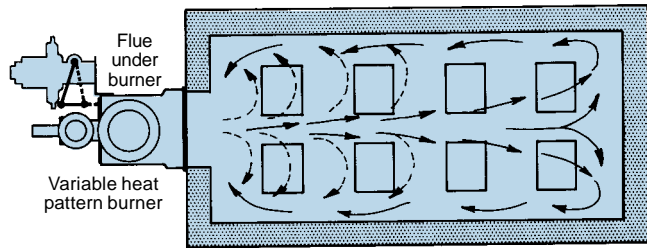
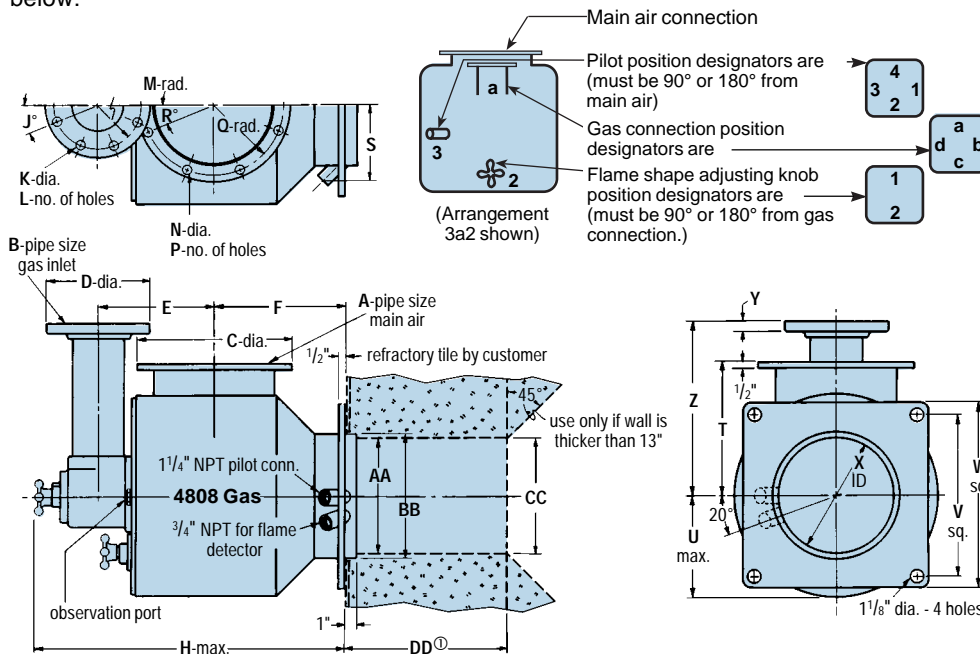
## AUTOMATIC OPERATION

Running the burner on automatic operation gives uniformity with high speed production.

An automatic temperature controller determines the firing rate but the difference between temperature readings at opposite ends of the furnace determines the flame shape, automatically changing to a short wide flame when the far end is hotter and to a long narrow flame when the burner end is hotter. With a conventional burner the firing rate would have to be reduced when the far end became too hot but the Variable Heat Pattern Burner allows continuous operation at full firing rate; so total production time is reduced.

It is recommended that automatic heat pattern adjustment be accompanied by automatic input and ratio control, the latter being of the mass flow type such as North America's microprocessor based combustion controller.

Burner backplate and gas connection cannot be rotated in the field. Specify arrangement designations **relative to the main air connection at 12 o'clock**, in the order below:



**One-Way Fired Malleablizing Oven, Plan View**

solid lines = conventional heat pattern--used in one part of cycle

dashed lines = new heat pattern--used in other part of cycle

## CONSTRUCTION

Lower handle on back adjusts for wide or narrow flame (see directions on backplate). Handle can be replaced with a yoke and clevis for operation by a control motor such as North America's 1600.

Upper handle on back adjusts for clear or luminous flame. (Directions clearly cast on burner near handle.)

Connections are provided for a 4025-0-T Gas Pilot and for a flame monitoring device (UV recommended).

An observation port is provided in the backplate.

The pilot regulator should be cross-connected to pilot mixture line or pilot air line because the burner section changes with vane position.

Burner designation	dimensions in inches and degrees															
	A	B	C	D	E	F	H	J°	K	L	M	N	P	Q	R°	S
4808-9	8	3	11	7 <sup>1</sup> / <sub>2</sub>	8 <sup>3</sup> / <sub>4</sub>	13 <sup>3</sup> / <sub>8</sub>	27 <sup>11</sup> / <sub>16</sub>	45	3/4	4	3	9/16	8	5	22 <sup>1</sup> / <sub>2</sub>	6 <sup>3</sup> / <sub>4</sub>
4808-10	10	4	14	9	10	13 <sup>3</sup> / <sub>8</sub>	30	22 <sup>1</sup> / <sub>2</sub>	3/4	8	3 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>16</sub>	12	6 <sup>1</sup> / <sub>8</sub>	15	6 <sup>3</sup> / <sub>4</sub>
4808-12	12	6	16	11	12 <sup>1</sup> / <sub>2</sub>	14 <sup>1</sup> / <sub>2</sub>	34 <sup>3</sup> / <sub>4</sub>	22 <sup>1</sup> / <sub>2</sub>	7/8	8	4 <sup>3</sup> / <sub>4</sub>	3/4	12	7 <sup>1</sup> / <sub>8</sub>	15	8 <sup>3</sup> / <sub>4</sub>

Burner designation	dimensions in inches											Wt, lb	recommended pilot
	T	U	V	W	X	Y	Z	AA	BB	CC <sup>②</sup>	DD <sup>①</sup>		
4808-9	11 <sup>1</sup> / <sub>2</sub>	8 <sup>11</sup> / <sub>16</sub>	14	16	10	3/4	13	10	10 <sup>3</sup> / <sub>4</sub> <sup>③</sup>	12 <sup>⑤</sup>	13	152	4025-0-T
4808-10	11 <sup>1</sup> / <sub>2</sub>	8 <sup>11</sup> / <sub>16</sub>	14	16	10	15/16	15	10	10 <sup>3</sup> / <sub>4</sub> <sup>③</sup>	10	13	225	4025-0-T
4808-12	13 <sup>1</sup> / <sub>2</sub>	10 <sup>11</sup> / <sub>16</sub>	18	20	14	1	16 <sup>9</sup> / <sub>16</sub>	14	14 <sup>3</sup> / <sub>4</sub> <sup>④</sup>	14	13	300	4025-0-T

① Includes furnace shell.

② Taper as required to pull mandrel.

③ Furnace opening should be 1/4" larger than BB dimension.

④ Furnace opening should be 1/2" larger than BB dimension.

⑤ CC larger than AA on the -9 size only.

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

North American Mfg. Co., 4455 East 71st Street, Cleveland, OH 44105-5600 USA, Tel: +1.216.271.6000, Fax: +1.216.641.7852  
email: sales@namfg.com • www.namfg.com