



RAF RETAIN-A-FLAME GAS BURNER NOZZLES

RFS STRAIGHT AND RFE ELBOW NOZZLES

Nozzle Size	Pipe Size NPT (See Note 3)	Discharge Area (In ²)	Capacity @ 6"wc Mixture Press. (1000 Btu/hr)
05	½	.11	40
07	¾	.18	65
10	1	.27	100
12	1 ¼	.7	250
15	1 ½	1.1	390
20	2	1.8	670
30	3	2.8	1000
40	4	5.2	2000

NOTES:

1. Capacities based on 80% combustion air in the mixture, natural gas with HHV of 1000 Btu/ft³, 0.60 S.G. and stoichiometric air/gas ratio of 10:1 with nozzle firing under no backpressure.
2. Nozzle will ignite with as little as 50% combustion air in the mixture, however, the remaining air must be induced.
3. Nozzle sizes 20, 30, and 40 are also available with a square flanged connection; flanged to NPT adapters are also available.

In accordance with Hauck's commitment to Total Quality Improvement, Hauck reserves the right to change the specifications of products without prior notice.

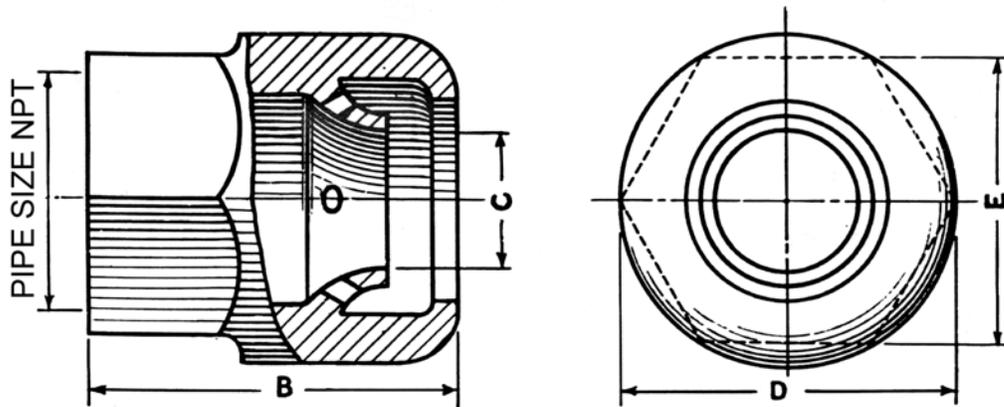


RAF RETAIN-A-FLAME GAS BURNER NOZZLES

Series 1100 Retain-A-Flame Straight Nozzles

Nozzle No.	Dimensions (Inches)				
	Pipe Size NPT	B	C	D	E
RFS 1105A	1/2	1 3/4	5/16	1 1/2	1 1/2*
RFS 1107A	3/4	1 3/4	7/16	1 1/2	1 1/2*
RFS 1110A	1	2 1/8	9/16	1 7/8	1 5/8
RFS 1112A	1 1/4	2 3/8	7/8	2 1/2	2 3/16
RFS 1115A	1 1/2	2 7/8	1 1/8	3 1/8	2 11/16
RFS 1120A	2	3 7/8	1 1/2	3 7/8	3 3/8
RFS 1130A	3	4 5/8	1 7/8	4 5/8	4 1/4
RFS 1140A	4	5 1/2	2 9/16	5 1/2	5 1/8

Note: *Nozzles for 1105A and 1107A are round.



RFS 1105A – 1140A

GW174

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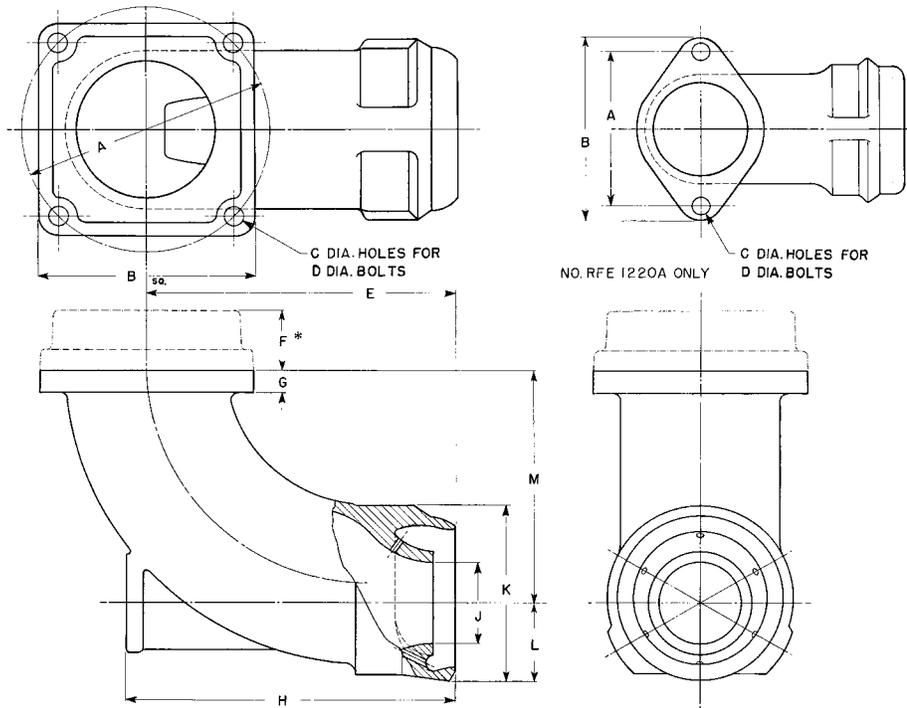


RAF RETAIN-A-FLAME GAS BURNER NOZZLES

Series 1200 Retain-A-Flame Flanged Elbow Nozzles

Nozzle No.	Dimensions (Inches)											
	A	B	C	D	E	F*	G	H	J	K	L	M
RFE 1220A	3 ⁹ / ₁₆	4 ³ / ₁₆	¹¹ / ₃₂	⁵ / ₁₆	4 ⁵ / ₈	¹³ / ₁₆	⁷ / ₁₆	5 ⁵ / ₁₆	1 ½	3 ³ / ₁₆	1 ½	3 ³ / ₈
RFE 1230A	5 ⁵ / ₈	4 ⁷ / ₈	⁷ / ₁₆	³ / ₈	7	1 ⁵ / ₁₆	⁷ / ₁₆	7 ½	1 ⁷ / ₈	4	1 ²⁵ / ₃₂	5 ¹ / ₄
RFE 1240A	6 ³ / ₈	5 ½	⁷ / ₁₆	³ / ₈	8	1 ½	½	8 ⁷ / ₁₆	2 ⁹ / ₁₆	5 ⁹ / ₁₆	2 ⁵ / ₈	6

Note: * Flange to threaded adapters available.



GY257

RFE 1220A – 1240A

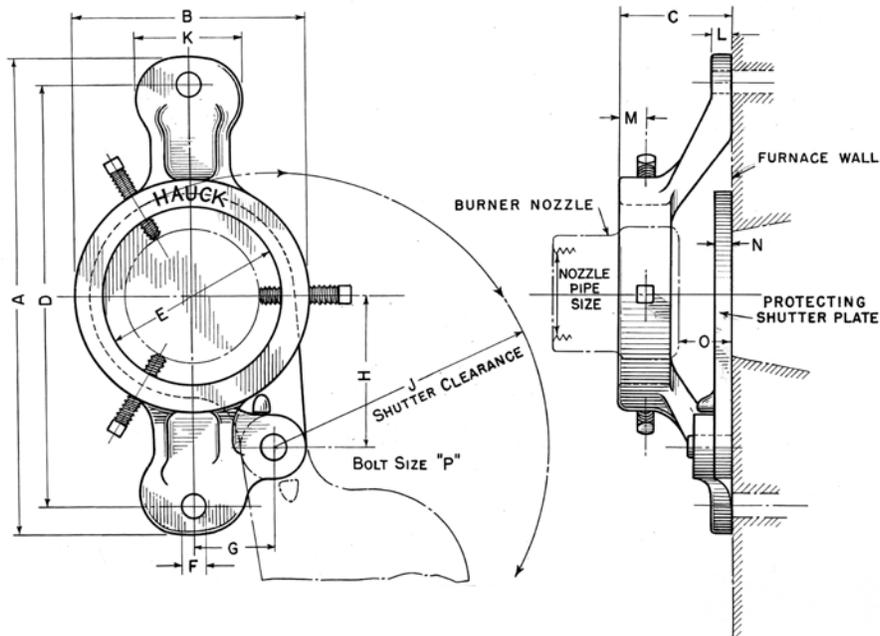
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RAF RETAIN-A-FLAME GAS BURNER NOZZLES

Mounting Brackets

Bracket No.	Retain-A-Flame Nozzle RFS & RFE	Dimensions (Inches)													
		A	B	C	D	E	F	G	H	J	K	L	M	N	O
BMB 2253A	1105,1107 & 1110	7	2 3/4	1 7/16	6	2 1/8	7/16	1 1/4	2 3/8	4 1/8	1 1/2	5/16	3/8	1/4	1/2
BMB 2254A	1112	9	5	2 1/8	8	4	7/16	1 1/2	2 7/8	5 3/8	2	3/8	1/2	5/16	5/8
BMB2254A	1115,1120 & 1220	9	5	2 1/8	8	4	7/16	1 1/2	2 7/8	5 3/8	2	3/8	1/2	5/16	3/4
BMB 2255A	1130, 1140, 1230 & 1240	13 3/4	7	3 3/4	12	5 7/8	5/8	2 1/4	4 3/4	8 1/2	2 1/2	1/2	3/4	1/2	3/4



GX142

Mounting Bracket BMB 2253A – BMB 2255A

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RAF RETAIN-A-FLAME GAS BURNER NOZZLES

SPARK IGNITION APPLICATION

All straight nozzles can be ordered equipped with a spark plug ignition system. RFS nozzle No.'s 3100 - 3115 are equipped with a spark plug mounted vertically on the side (see Figure 1); this arrangement prohibits the use of nozzles with nozzle mounting brackets. RFS nozzle No.'s 3120 - 3140 are equipped with a spark plug mounted at an angle of approximately 45° (see Figure 1) which enables the use of nozzle mounting brackets. RFE nozzle No.'s 3420 - 3440 have the spark plug and adapter bushing mounted parallel to the nozzle tip and can also be used with nozzle mounting brackets.

Each nozzle equipped with a spark plug will require a 5000 volt standard coil ignition transformer with a high voltage lead wire, connectors, and momentary pushbutton.

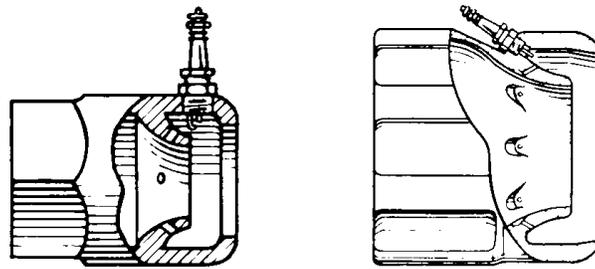


Figure 1. Spark Plug Ignition of Straight Nozzles

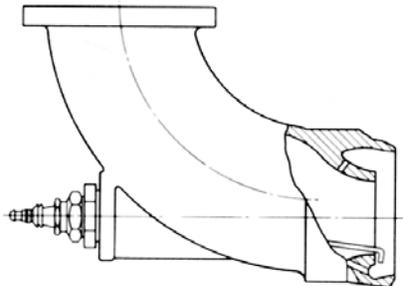


Figure 2. Spark Plug Ignition of Elbow Nozzles

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RAF RETAIN-A-FLAME GAS BURNER NOZZLES

NOZZLE SELECTION

When selecting a nozzle, the nozzle size is critical. The unit chosen must meet the maximum capacity requirements of the application but not be oversized. An oversized nozzle may reduce the degree of turndown available as well as increase the probability of a flashback.

To determine the appropriate nozzle size for your application:

Determine the mixture manifold pressure ("wc) for the mixer being used. Appropriate manifold pressures appear along the top of Table 1 (opposite page). When the mixer services two or more nozzles, divide the manifold pressure by the number of nozzles used. Next subtract from each pressure the pressure losses associated with the piping to each burner. The result approximates the pressure at each nozzle. For assistance, contact Hauck.

Determine the CFH required for each nozzle. If one nozzle is used, this will be the CFH of the mixer. If two or more nozzles are used with one mixer, divide the mixer CFH by the number of nozzles it supplies.

Using the values obtained above, find the point on Table 1 (opposite page) which satisfies both of these values.

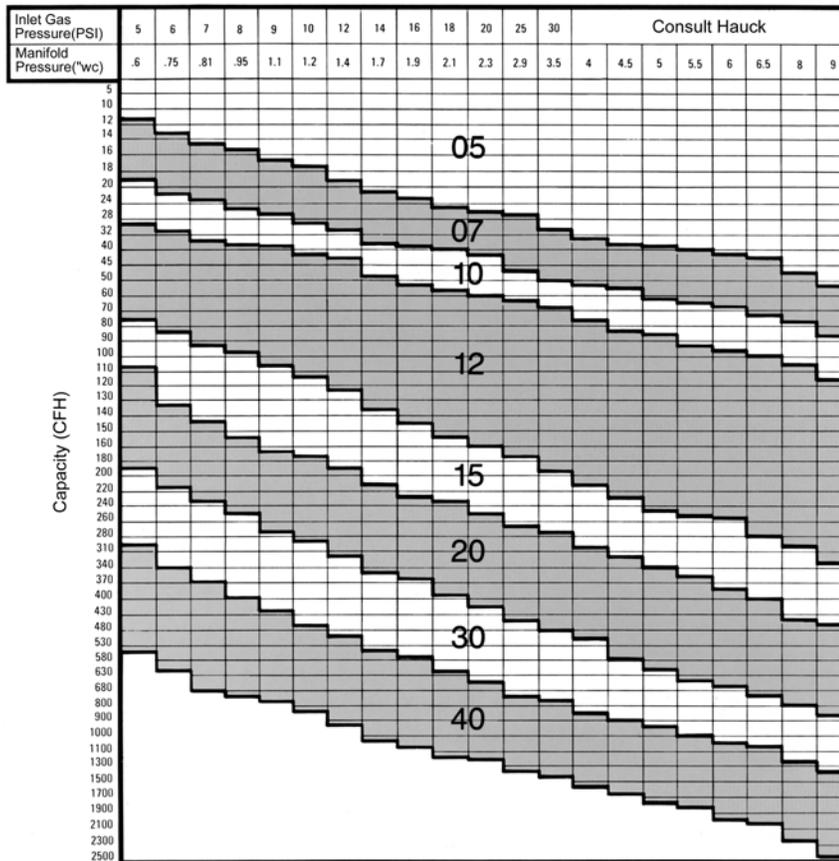
Read the nozzle size number directly from the graph.

Using the charts given below, determine the nozzle no. for the nozzle size and configuration you require. When ordering a Retain-A-Flame nozzle, include the complete no. as listed below.

Nozzle Size	Nozzle No.	
	Threaded Straight	
	Manual	Spark
05	RFS 1105A	RFS 3105A
07	RFS 1107A	RFS 3107A
10	RFS 1110A	RFS 3110A
12	RFS 1112A	RFS 3112A
15	RFS 1115A	RFS 3115A
20	RFS 1120A	RFS 3120A
30	RFS 1130A	RFS 3130A
40	RFS 1140A	RFS 3140A
Nozzle Size	Flanged Elbow	
	Manual	Spark
	20	RFE 1220A
30	RFE 1230A	RFE 3430A
40	RFE 1240A	RFE 3440A

(OVER)

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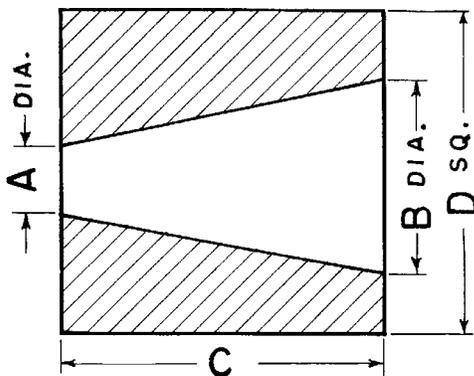
Notes:

1. Capacities based on natural gas with HHV of 1000 Btu/ft³, 0.60 S.G., and stoichiometric air/gas ratio of 10:1 with nozzle firing under no back pressure.
2. Inlet Gas Pressure refers to use only with Hauck High Pressure Gas-Air Inspirators (AIG).

Table 1. Nozzle Selection – Capacity vs. Pressure

REFRACTORY BURNER TILES

Refractory tiles are recommended when firing into furnaces, oven, or kilns. These tiles protect the burner nozzle from furnace heat, reduce heat loss at the firing port inlet, and control secondary air. They are cube shaped with a conical firing opening sized for the best operating results. They may be placed directly into a firing wall and still maintain the wall's strength. Actual operating conditions determine the tile selected. Consult Hauck for recommendations.



Nozzle Size	Tile Dimensions (Inches)			
	A	B	C	D
05	1 ¼	3	5	5
07	1 ¼	3	7 ½	7 ½
10	1 ½	4	9	9
12	2	4	9	9
15	2 ½	5	9	9
20	3 ½	7	9	9
30	4	8	13 ½	13 ½
40	5	10	13 ½	13 ½