

Capacity/Selection Data

Series “LG” Mixing Tubes and MULTI-RATIO™ Mixers

General

The capacity of an “LG” Mixing Tube or MULTI-RATIO™ Mixer is determined by its physical size, by the size, type, and number of burners or nozzles through which it fires, and by the field conditions under which it operates.

Choose from the following capacity/selection tables for the combination of mixer, burner and operating conditions of your application.

Slight variations in combustion chamber pressure, draft conditions or the availability of secondary air can affect capacity and performance.

With STICKTITE™ Burner Nozzles

Capacities and nozzle sizing information are provided at right for burner systems utilizing these mixers with STICKTITE™ Burner Nozzles. The left side of the table deals with capacities, and is based on natural gas firing against balanced or slightly positive combustion chamber pressures.

Maximum capacities are cataloged for four different air differential pressures (measured at inlet to the mixer).

Back pressures of +.15" wc will reduce capacities by 5%; back pressures of +.25" wc by 15%.

Draft conditions will permit some degree of overfiring if secondary air is available around the burner and if additional flame length can be tolerated.

To select a mixing tube and burner combination, determine required heat release and your available air differential pressure as measured at the mixer inlet. Read downward in the appropriate column to the desired maximum heat release. Then read across that line to find the mixer designation and the “HD” STICKTITE™ Nozzle size.

Multiple nozzles can be used, but the actual capacities will depend upon the type, size and quantity of nozzles selected for your application.

Maximum Capacity (1000's Btu/hr) at differential combustion air pressures (measured at mixer inlet)				Minimum Capacity 1000's Btu/hr	Mixer Designation MR=MULTI-RATIO® LG=LG Mixing Tube	HD STICKTITE® Nozzle Size
15 osi	11 osi	7 osi	5 osi			
95	80	65	55	13	MR LG -75-22	3/4"-6
105	90	70	60	17	MR LG -75-25	3/4"-7
130	110	90	75	21	MR LG -100-28	1"-8
160	135	110	95	26	MR LG -100-31	1"-9
210	180	150	125	32	MR LG -125-37	1-1/4"-10
280	240	195	165	44	MR LG -125-41	1-1/4"-12
340	300	240	210	60	MR LG -125-46	1-1/4"-14
450	380	310	265	75	MR LG -150-56	1-1/2"-16
560	430	380	325	100	MR LG -150-63	1-1/2"-18
690	580	475	400	120	MR LG -200-70	2"-21
800	690	555	475		MR LG -200-73	
990	855	680	580	160	MR LG -200-80	2"-24
1190	1010	825	700	210	MR LG -300-98	2-1/2"-27
1420	1210	980	830		MR LG -300-106	
1760	1490	1200	1000	245	MR LG -300-116	3"-30
2090	1780	1450	1200	290	MR LG -400-124	4"-34
2550	2180	1750	1480	460	MR LG -400-136	4"-41
3040	2580	2000	1660		MR LG -400-142	
3160	2650	2080	1685			
3620	3100	2500	2050	720	MR LG -500-157	5"-50
3910	3350	2600	2100		MR LG -500-166	
4160	3520	2850	2400			
4850	4020	3200	2600			

Nomenclature – Both MULTI-RATIO™ Mixers and Series “LG” Mixing Tubes are identified by a 3-part designation.

For example: MR-75-22 or LG-75-22

“LG” or “MR” indicates mixer type; -75 indicates discharge pipe size in inches (75 = 3/4", 150 = 1-1/2", etc.); -22 indicates throat diameter of air orifice plate in 64ths of an inch (22 = 22/64" air port diameter)

Capacity/Selection Data

Series "LG" Mixing Tubes and MULTI-RATIO™ Mixers with Sealed Nozzles

Capacities and nozzle sizing

information is provided at right for systems utilizing these mixers with SEALED NOZZLES. The left side of the table deals with capacities, and is based on natural gas firing against balanced or slightly positive combustion chamber pressures.

Maximum capacities are cataloged for four different air differential pressures (measured at inlet to mixer). Be sure to allow for piping losses from combustion air blower.

Back pressures of +.15" wc will reduce capacities by 5%; back pressure of +.25" wc by 15%.

To select a mixer and burner combination, determine required heat release and your available air differential pressure. Read downward in the appropriate column to the desired maximum heat release. Then read across that line to find the mixer designation and the SEALED NOZZLE size.

Multiple nozzles can be used, but the actual capacities will depend upon the type, size and quantity of nozzles selected for your application.

Maximum Capacity (1000's Btu/hr) at differential combustion air pressures (measured at mixer inlet)				Minimum Capacity 1000's Btu/hr	Mixer Designation MR=MULTI-RATIO® LG=LG Mixing Tube	"SN" Sealed Nozzle Size
15 osi	11 osi	7 osi	5 osi			
95	80	65	55	13	MR LG -75-22	3/4"-5
105	90	70	60	17	MR LG -75-25	3/4"-7
130	110	90	75	26	MR LG -100-28	1"-9
160	135	110	95		MR LG -100-31	
210	180	150	125	44	MR LG -125-37	1-1/4"-12
280	240	195	165		MR LG -125-41	
340	300	240	210	60	MR LG -125-46	1-1/4"-14
450	380	310	265	75	MR LG -150-56	1-1/2"-16
560	430	380	325	100	MR LG -150-63	1-1/2"-18
690	580	475	400	150	MR LG -200-70	2"-20
800	690	555	475	160	MR LG -200-73	2"-24
990	855	680	580		MR LG -200-80	
1190	1010	825	700	210	MR LG -300-98	2-1/2"-27
1420	1210	980	830		MR LG -300-106	
1760	1490	1200	1000		MR LG -300-116	
2090	1780	1450	1200	360	MR LG -400-124	3"-33
2550	2180	1750	1480	560	MR LG -400-136	---
3040	2580	2000	1660		MR LG -400-142	
3160	2650	2080	1685			
3620	3100	2500	2050	720	MR LG -500-157	---
3910	3350	2600	2100		MR LG -500-166	
4160	3520	2850	2400			
4850	4020	3200	2600			

Capacity/Selection Data

Series “LG” Mixing Tubes and MULTI-RATIO™ Mixers with Style A or B LINOFLAME® Burners

Sizing and capacity information for systems using these mixers and Style A or B LINOFLAME® Burners is shown on page 3208.

This information is applicable for natural gas or propane gas firing, with fuel supply being regulated in the range of 3" wc to 8" wsi.

If burners will be firing in still air, use the information in the table on page 3208, which is based on balanced pressures in combustion chamber and on 100% premixture (on-ratio firing).

If burners are to be used to heat an air stream, follow the guidelines given below the table for suction-side or pressure-side firing. This information is based on gas-rich firing, using part of the air stream as secondary air to complete combustion.

Very high degrees of recirculation with resulting low oxygen content may reduce attainable maximum capacities to those illustrated in the table.

Air velocities must be maintained in the range of 500-1500 SFPM, and return air temperature across the burner in recirculating systems must not exceed 500°F (260°C).

To determine velocity, make a trial burner selection, calculate displacement at .20 ft² per lineal foot of burner, subtract from duct cross-sectional area and divide into total air flow.

Recirculated air systems must include at least 25 SCFM of fresh air for each 100,000 Btu/hr of maximum capacity.

To select a mixer and burner combination, determine your available air differential pressure at the mixer inlet and read downward under the appropriate column to your desired maximum capacity. Read across that line to the resulting minimum capacity available.

When you are satisfied with the indicated maximum and minimum firing rates, read across to the appropriate mixer designation. On that same line, you will find six possible burner lengths.

Choose the one that will best fit your space requirements. Arrange a burner assembly using that total footage, then specify it with the drilling indicated at the top of that column.

For special application requirements, contact your Maxon representative for possible “customized” burner drillings based on total discharge area per lineal foot.

Capacity/Selection Data

Series "LG" Mixing Tubes and MULTI-RATIO™ Mixers with Style A or B LINOFLAME® Burners

LINOFLAME® Burners in still air applications

Maximum Capacity (1000's Btu/hr) at differential combustion air pressures (measured at mixer inlet)				Minimum Capacity 1000's Btu/hr	Mixer Designation MR=MULTI-RATIO® LG=LG Mixing Tube	Style "A" or "B" LINOFLAME® Burner assembly length (feet of indicated type and drillings)						
15 osi	11 osi	7 osi	5 osi			B-36-4242	B-96-5050	B-96-4444	B-96-3643	A-72-1733	A-72-C-3 [1]	
114	95	83	68	22	MR LG -100-28	1	.75	.5	---	---	---	
160	118	100	86	27	MR LG -100-31	1.5	1	.75	.5	---	---	
190	160	138	115	29	MR LG -125-37	2.25	1.5	1	.75	.5	---	
250	210	180	150	40	MR LG -125-41	3	2	1.5	1	.75	---	
320	270	212	189	57	MR LG -125-46	4	2.5	2	1.25	1	.5	
410	345	284	240	71	MR LG -150-56	5	3.5	2.5	1.75	1.25	.75	
510	395	350	295	92	MR LG -150-63	6.5	4.5	3	2.25	1.5	1	
620	525	405	360	124	MR LG -200-70	8	5.5	4	2.75	2	1.25	
730	620	490	427	136	MR LG -200-73	9	6.25	4.5	3	2.25	1.5	
890	750	600	525	145	MR LG -200-80	11	7.75	5.5	3.75	2.5	1.75	
1060	890	760	630	163	MR LG -300-98	14	9.5	6.75	5	3.5	2	
1280	1080	865	750	182	MR LG -300-106	16	11	7.25	5.5	4	2.5	
1550	1310	1110	900	250	MR LG -300-116	18	12.5	8.5	6	5	3	
1900	1620	1270	1080	340	MR LG -400-124	22	15	11	7.5	5.5	3.5	
2300	1960	1610	1330	420	MR LG -400-136	26	18	12	9	6.5	4.5	
2780	2180	1910	1585	510	MR	-400-142	32	23	16	11	8	5.5
2850	2410	1910	1550	510	LG							
3300	2800	2400	1930	590	MR	-500-157	40	28	20	14	10	6.5
3500	3040	2400	1930	590	LG							
3800	3250	2620	2160	660	MR	-500-166	45	32	22	17	12	7.5
4400	3660	2940	2400	660	LG							

[1] Maximum capacity not to exceed 525,000 Btu/hr per lineal foot with these drillings

Suction-side applications (up to -1.0" wc suction): capacities will increase approximately 30% over still air capacities listed above

Pressure side applications (up to +2.0" back pressure): capacities will increase approximately 20% over still air capacities listed above

Capacity/Selection Data

Series “LG” Mixing Tubes and MULTI-RATIO™ Mixers with “VF” LINOFLAME® Burners

Capacities for Type “VF” LINOFLAME® Burners used with these mixers are shown in the table below. These capacities are based on natural gas firing and a minimum differential mixture pressure of 0.10" wc.

Increased minimums may be necessary in air stream.

Maximum capacities are a function of the available air differential pressure and are shown for four different ranges of air differential pressure. Consider pressure drops carefully when sizing blower.

To select equipment, determine required heat release and your available air differential pressure. Read downward in the appropriate column to the desired maximum capacity. Opposite that data you will find the recommended size of mixing device and a summary of burner footage required for either “VFL” or “VFH” LINOFLAME® Burners.

Maximum Capacity (1000's Btu/hr) at differential combustion air pressures (measured at mixer inlet)				Minimum Capacity 1000's Btu/hr	Mixer Designation MR=MULTI-RATIO® LG=LG Mixing Tube	Lineal feet of VF LINOFLAME® Burner	
						Type VFL	Type VFH
15 osi	11 osi	7 osi	5 osi				
145	130	105	90	15	MR LG -125-31	.5	.25
285	255	200	170	30	MR LG -125-41	1	.5
585	525	430	335	60	MR LG -150-63	2	1
855	760	600	510	90	MR LG -200-80	3	1.5
1160	1040	820	720	120	MR LG -300-84	4	2
1450	1300	1050	910	150	MR LG -300-98	5	2.5
1720	1590	1320	1180	180	MR LG -300-106	6	3
2050	1830	1500	1300	210	MR LG -300-116	7	3.5
2300	2100	1750	1500	240		8	4
2900	2650	2200	1950	300	MR LG -400-136	10	5
3400	3050	2550	2250	360	MR LG -400-142	12	6
3950	3600	3050	2650	420	MR LG -500-157	14	7
4400	3900	3400	3000	480	MR	-500-157	16
4500	4100	3550	3100	480	LG		
4650	4200	3700	3250	540	MR	-500-166	18
5200	4850	4000	3500	540	LG		
5700	5300	4400	3850	600	LG	-500-166	20

Capacity/Selection Data

Series “LG” Mixing Tubes and MULTI-RATIO™ Mixers with INFRAWAVE® Burners

Capacities and required burner footage for INFRAWAVE® Burner systems fed by “LG” Mixing Tubes or MULTI-RATIO™ Mixers are summarized in the table below. All capacity information given is **for natural gas firing**.

Minimum is based on approximately 0.25" wc differential mixture pressure in the burner. The maximum capacities are obtainable when the indicated air differential pressure is available at “LG” tube or MULTI-RATIO™ Mixer inlet.

Consider pressure drops carefully when sizing blower, so that the required differential is available.

Once the mixing device has been sized for the desired capacity, check the right side of the table for required burner footage of single grid or double grid INFRAWAVE® Burners.

Maximum Capacity (1000's Btu/hr) at differential combustion air pressures (measured at mixer inlet)			Minimum Capacity 1000's Btu/hr	Mixer Designation MR = MULTI-RATIO® LG = LG Mixing Tube	Lineal feet of INFRAWAVE® Burner	
					Type SG Single Grid	Type DG Double Grid
11 osi	7 osi	5 osi				
120	100	75	15	MR LG -125-31	2	1
240	200	150	30	MR LG -125-41	4	2
480	400	300	60	MR LG -150-63	8	4
720	600	450	90	MR LG -300-78	12	6
960	800	600	120	MR LG -300-84	16	8
1200	1000	750	150	MR LG -300-98	20	10
1440	1200	900	180	MR LG -300-106	24	12
1680	1400	1050	210	MR LG -300-116	28	14
1920	1600	1200	240		32	16
2400	2000	1500	300	MR LG -400-136	40	20
2880	2400	1800	360	MR LG -400-142	48	24
3360	2800	2100	420	MR	56	28
3840	3200	2400	480	LG -500-157		
4320	3600	2700	540	MR	72	36
4800	4000	3000	600	LG -500-166		

Capacity/Selection Data Series "HG" Mixing Tubes

General

The capacity of a Series "HG" Mixing Tube is determined by its physical size, air pressures, the size, type and number of burner nozzles fired, and by the field conditions under which it operates.

Choose from the following capacity/selection tables for the combination of mixing tube, burners, and operating conditions for your application.

Slight variations in combustion chamber pressure, draft conditions or the availability of secondary air can affect capacity ratings and performance.

Gas Orifice Drillings

Each Series "HG" Mixing Tube will have a specific number and size of gas orifices drilled in the venturi throat of the mixer. The size of the gas orifice is stamped into the metal casting on the outside of each mixing tube body.

Refer to the table below for the suggested drillings.

Nomenclature

All Series "HG" Mixing Tubes are identified by pipe size.

Example: 3" Series "HG" Mixing Tube
(3" is the inlet air pipe connection and the mixture discharge pipe size)

Gas Orifice Drillings for Series "HG" Mixing Tubes

NOTE: Drillings below based on 2 PSIG inlet gas pressure (measured at "HG" Mixing Tube gas inlet)

For fully premixed systems				Size of "HG" Mixing Tube (number of gas orifices in parentheses)	For partially premixed systems			
Combustion Air Pressure measured at air inlet of "HG" Mixing Tube	Gas orifice drillings for Series "SN" and STICKTITE Nozzles, Style A, B & VF LINOFLAME, INFRAWAVE and LO-NOX Burners				Combustion Air Pressure measured at air inlet of "HG" Mixing Tube	Gas orifice drillings for Series "66" AIRFLO and COMBUSTIFUME Burners		
	for Natural Gas	for Propane Gas	for Butane Gas			for Natural Gas	for Propane Gas	for Butane Gas
8 osi	11/64"	9/64"	#29	2" HG (4)	6 & 8 osi	21/64"	I	F
12 osi	7/32"	#16	#18			21/64"	I	F
16 osi	15/64"	#11	#14			21/64"	I	F
8 osi	3/16"	#23	#27	3" HG (6)		7/16"	T	R
12 osi	13/64"	#18	#22			29/64"	3/8"	T
16 osi	7/32"	#15	#18			35/64"	29/64"	7/16"
8 osi	A	#12	#15	4" HG (8)				
12 osi	F	#3	#8					
16 osi	J	#1	3/8"					
8 osi	F	#4	#8	6" HG (12)				
12 osi	K	#1	7/32"					
16 osi	N	D	A					
8 osi	S	9/32"	17/64"	8" HG (12)				
12 osi	13/32"	U	11/32"					
16 osi	15/32"	U	11/32"					

Capacity/Selection Data

Series "HG" Mixing Tubes with STICKTITE™ Burner Nozzles

Maximum and minimum capacities that may be expected from "HG" Mixing Tubes when firing through a single STICKTITE™ Nozzle of the indicated size are shown in the table below.

The combustion air blower must be selected to allow for whatever drop exists between it and the "HG" Mixing Tube inlet. All figures below are based on

negligible pressure drop between the "HG" Mixing Tube outlet and STICKTITE™ Nozzle, and on 100% premix firing into a chamber with slight positive pressure.

Multiple nozzles can be used, but the actual capacities will depend upon the type, size and quantity of nozzles selected for your application.

Single STICKTITE™ Nozzle capacities at various air pressures

"HG" Mixing Tube size	STICKTITE™ Nozzle size	Minimum Capacity 1000's Btu/hr	Maximum Capacity in 1000's Btu/hr at indicated differential air pressures (measured at mixing tube inlet)					
			4 osi	6 osi	8 osi	10 osi	12 osi	14 osi
2"	HD-2"-24	160	850	1000	1150	1280	1400	1480
3"	HD-3"-30	240	1150	1400	1550	1700	1850	2000
4"	HD-4"-41	450	2200	2600	3000	3300	3600	3900
6"	HD-6"-60	1000	5000	6000	7000	7900	8500	9200
8"	HD-8"-88	2400	11000	13500	15000	16500	18000	19500

Series "HG" Mixing Tubes with Series "SN" Sealed Nozzle Burners

Capacities and nozzle sizing information are provided below for systems utilizing "HG" Mixing Tubes with Sealed Nozzles. The right side of the table deals with capacities, and is based on natural gas firing against balanced or slightly negative combustion chamber pressures.

Maximum capacities are cataloged for three different air differential pressures (measured at inlet to

mixer). Be sure to allow for piping losses from combustion air blower.

Back pressures of +0.15" wc will reduce capacities by 5%; back pressures of 0.25" wc by 15%.

Multiple nozzles can be used, but the actual capacities will depend upon the type, size and quantity of nozzles selected for your application.

Single Series "SN" Sealed Nozzle capacities at various combustion air pressures

"HG" Mixing Tube Size	Series "SN" Sealed Nozzle Burner	Minimum Capacity 1000's Btu/hr	Maximum Capacity in 1000's Btu/hr at indicated differential air pressure (measured at mixing tube inlet)		
			4 osi	6 osi	10 osi
2"	SN-2"-20	160	690	840	1100
3"	SN- 2-1/2" -27	260	1300	1500	1950
4"	SN-4"-42	560	2200	2700	3350
6"	SN-6"-60	1000	4350	5250	6700

Capacity/Selection Data

Series "HG" Mixing Tubes with Style A or B LINOFLAME® Burners

Sizing and capacity information for systems using "HG" Mixing Tubes and Style A or B LINOFLAME® Burners is shown in Table 1 below and Table 2 on the following page.

If burners will be firing in still air, use Table 1 (below).

Table 1 is based on balanced pressures in the combustion chamber and on 100% premixture (on-ratio firing).

Both tables apply for natural gas, propane and butane gas firing, with fuel supply being regulated to the range of 2 PSIG.

To select a mixer and burner combination, determine required heat release and your available air differential pressure at mixer inlet. Read downward

under the appropriate column to your desired maximum capacity, then across that line to the resulting minimum capacity available.

When you are satisfied with the indicated maximum and minimum firing rates, read across to the appropriate mixer designation. On that same line, you will find five possible burner lengths.

Choose the one that will best fit your space requirements. Arrange a burner assembly using that total footage, then specify it with the drilling indicated at the top of that column.

For special application requirements, contact your Maxon representative for possible "customized" burner drillings based on total discharge area per lineal foot.

Table 1: LINOFLAME® Burners in still air applications

Maximum Capacity (1000's Btu/hr) at indicated differential combustion air pressures (measured at mixer inlet)		Minimum Capacity in 1000's Btu/hr	"HG" Mixing Tube Size	Lineal feet of LINOFLAME® Burner (feet of indicated type and drillings)				
				B-36-4242	B-96-5050	B-96-4444	B-96-3643	A-72-1733
8 osi	6 osi							
865	755	140	2" HG	11	7	5	3.75	2.5
1600	1360	230	3" HG	16	11	8	6	4
2730	2410	395	4" HG	30	20	14.5	10.5	7
5450	4750	850	6" HG	65	42	30	22	15
8200	7150	1260	8" HG	97	63	45	33	22

Capacity/Selection Data

Series “HG” Mixing Tubes with Style A or B LINOFLAME® Burners

If burners are to be used to heat an air stream, see Table 2 (below).

Table 2 is based on gas-rich firing, using part of the air stream as secondary air to complete combustion.

Very high recirculation may reduce attainable maximum capacities to those illustrated in Table 1 (page 3213).

Air velocities must be maintained in the range of 500-1500 SFPM, and return air temperature across the burner in recirculating systems must not exceed 500°F (260°C).

To determine velocity, make a trial burner selection, calculate displacement at .20 ft² per lineal foot of burner, subtract from duct cross-sectional area and divide into total air flow.

Recirculated air systems must include at least 25 SCFM of fresh air for each 100,000 Btu/hr of maximum capacity.

Table 2: LINOFLAME® Burners for air heating applications

Assuming uniform velocity from 500 to 1500 sfpm (and a return air temperature not to exceed 500°F (260°C), if system is recirculating)											
Maximum Capacity in 1000's Btu/hr at differential combustion air pressures (measured at mixer inlet)				Minimum Capacity in 1000's Btu/hr	Minimum SCFM fresh air required to secure maximum capacities [1]	HG Mixing Tube Size	Lineal feet of LINOFLAME® Burner (feet of indicated type and drillings)				
On pressure side of fan (back pressures up to +2" wc)		On suction side of fan (suctions ranging to -1" wc)					B-36-4242	B-96-5050	B-96-4444	B-96-3643	A-72-1733
6 osi	4 osi	6 osi	4 osi								
925	770	1000	840	170	250-285	2" HG	7.5	6.5	5	3.75	2.5
1650	1430	1800	1550	290	450-500	3" HG	12	10	8	6	4
2900	2420	3200	2650	630	800-870	4" HG	21	19	14.5	10.5	7
5700	4750	6250	5200	880	1500-1750	6" HG	45	38	30	22	15
8550	7150	9350	7800	1350	2250-2620	8" HG	67	57	45	33	22

[1] The smaller figure indicates SCFM fresh air which must be introduced into the system for the maximum burner capacity shown in the 4 osi column, and the larger figure the amount required for the 6 osi capacity. Amounts for other capacities may be interpolated.

Capacity/Selection Data

Series “HG” Mixing Tubes with “VF” LINOFLAME® Burners

Capacities of Type “VF” LINOFLAME® Burner assemblies supplied by “HG” Mixing Tubes are shown in the table below.

Minimum capacity is based on 0.10" wc differential mixture pressure in the “VF” burner. Air stream velocities higher than 1500 SFPM and larger burner assemblies may require increased minimums.

Maximum capacities are shown for three differential combustion air pressures.

To size a system, determine required heat release and available air differential pressure at the mixer inlet. Read downward in the appropriate column to the desired maximum capacity. Opposite that figure you will find the required “HG” Mixing Tube size, expected minimum capacity, and the required burner footage.

"HG" Mixing Tube Size	Minimum Capacity 1000's Btu/hr	Maximum Capacity (1000's Btu/hr) at differential air pressures (measured at mixer inlet)			Lineal feet of "VF" LINOFLAME® Burner	
		4 osi	6 osi	10 osi	VFL LINOFLAME® Burner	VFH LINOFLAME® Burner
2"	60	---	600	---	2	1
	120	850	1000	1200	4	2
3"	120	---	1200	---	4	2
	180	1400	1650	1800	6	3
	240	1750	2100	2400	8	4
	300	2050	2400	---	10	5
4"	240	---	2400	---	8	4
	300	---	---	3000	10	5
	360	2600	3250	3600	12	6
	420	2950	3800	4200	14	7
	480	3250	4000	4800	16	8
	540	3400	4400	---	18	9
6"	480	---	4800	---	16	8
	540	---	---	5400	18	9
	600	4500	5600	6000	20	10
	660	4900	6100	6600	22	11
	720	5300	6600	7200	24	12
	840	6100	7500	8400	28	14
	960	6800	8400	9600	32	16
	1080	7600	9400	---	36	18
1200	8100	---	---	40	20	
8"	840	---	8400	---	28	14
	1080	---	---	10800	---	18
	1200	---	10000	1200	---	20
	1320	9600	11900	13200	---	22
	1440	10400	12900	14400	---	24
	1560	10900	13500	15600	---	26
	1680	11400	14300	16800	---	28
	1800	12000	15100	18000	---	30

Capacity/Selection Data

Series "HG" Mixing Tubes with INFRAWAVE® Burners

Capacity and burner footage suggestions for systems utilizing Series "HG" Mixing Tubes and INFRAWAVE® Burners are summarized in the table below.

Minimum capacities shown are based on approximately 0.25" wc differential mixture pressure in the burner. The three maximums shown are based on the indicated combustion air differential pressure at the inlet to the "HG" Mixing Tube.

To size a system, determine required heat release and available air differential pressure, then read downward in the appropriate column to the desired capacity. Opposite that figure, you will find the required "HG" Mixing Tube size and burner footage recommendations.

"HG" Mixing Tube Size	Minimum Capacity 1000's Btu/hr	Maximum Capacity (1000's Btu/hr) at differential air pressures (measured at mixer inlet)			Lineal feet of INFRAWAVE® Burner	
		4 osi	6 osi	10 osi	Type "SG" Single Grid	Type "DG" Double Grid
2"	120	720	865	960	16	8
3"	180	1080	1295	1440	24	12
	240	1440	1730	1920	32	16
	300	1800	2160	2400	40	20
4"	360	2160	2580	2880	48	24
	420	2520	3025	3360	56	28
	480	2880	3450	3840	64	32
	540	3240	3890	4320	72	36
6"	600	3600	4320	4800	80	40
	660	3960	4750	5280	88	44
	720	4320	5185	5760	96	48
	840	5040	6050	6720	112	56
	960	5760	6915	7680	128	64
	1080	6480	7776	8640	144	72
	1200	7200	8640	9600	160	80

Capacity/Selection Data

Series “HG” Mixing Tubes with Series “66” AL5 AIRFLO® Burners

For firing in recirculated air streams, see table at right for the capacities available from various lengths of AL5 AIRFLO® Burner assemblies when used with “HG” Mixing Tubes. Data is based on 2 PSIG natural gas supply pressure at the mixer and 2600-3500 SFPM air stream velocity across the burner.

Turndown ratios of 15:1 are possible using natural gas. Uneven and/or turbulent air flows, or the use of propane, will give higher minimums and reduce turndown.

The capacities shown are based on a minimum of 80 SCFM of fresh air being added for each 100,000 Btu/hr of heat input. Lower fresh air volumes, the presence of exceptionally high moisture, or other combustion-retarding or inert components may require special consideration.

Differential air pressure of 5.2" wc is required for all of these combinations and is measured between burner inlet and duct/chamber static pressure.

Multiple “HG” Mixing Tubes may be used with a single MICRO-RATIO® Valve, but remember to size blower for the combined SCFM required and allow for piping losses.

Recirculated air with Series “66” AL5 AIRFLO® Burner

Capacity 1000's Btu/hr	"AL5" Footage	"HG" Size	Primary Combustion Air required [1] through "HG" Mixing Tube (SCFM)
325	1/2	2"	18
650	1		37
975	1-1/2	3"	55
1300	2		73
1625	2-1/2		92
1950	3		110
2275	3-1/2		128
2600	4	4"	147
2925	4-1/2		165
3250	5		183
3900	6		220
4550	7		256
5200	8	6"	293
5850	9		330
6500	10		367
7150	11		403
7800	12		440
8450	13	8"	477
9100	14		513
9750	15		550
10400	16		587
11050	17		623
11700	18		660
12350	19		697
13000	20		733
13650	21		770
14300	22		807
14950	23	844	
15600	24	880	
16250	25	917	
16900	26	954	
17550	27	990	
18200	28	1027	

[1] Approximately 1/3 of total required at maximum capacity. Balance from air stream.

Capacity/Selection Data

Series "HG" Mixing Tubes with Types 5CF-5 & 4CF-5 COMBUSTIFUME® Burners

Effluent air streams with oxygen levels of 12 to 16% may be heated with COMBUSTIFUME® Burners supplied with a partial premixture of air and natural or propane gas.

A complete burner system to handle these difficult applications would include a COMBUSTIFUME® Burner assembly, Series "HG" Mixing Tube, MICRO-RATIO® Control Valve and a combustion air blower. Your Maxon representative can help you select from the broad range of options available.

Table 1: Design Parameters

Percent of oxygen in effluent:	12 to 12.9	13 to 13.9	14 to 15.9
Required increase in gross heat release (Btu/hr)	10%	7.5%	5%
Maximum heat release per lineal foot of burner (Btu/hr) (COMBUSTIFUME® Burner with 5 rows of #36 drilled holes = 120 holes per foot)	700,000		1,000,000
Maximum footage of COMBUSTIFUME® Burner per inlet feed	5	6	
Minimum heat release (Btu/hr) per lineal foot of burner	75,000		
Combustion air required through Series "HG" Mixing Tube (SCFM per lineal foot of burner)	47	41	34
Differential air pressure required (inches water column) as measured between burner inlet and duct/chamber static pressure	8	6.4	5.5

General Selection Procedure:

1. Determine available oxygen level in air stream to be heated.
2. Enter Table 1 under column with specific oxygen level for parameters of your application. Available oxygen level dictates primary air and extra heat requirements for additional primary air flows.
3. Calculate gross heat requirement.
4. Determine burner footage and inlet feed requirements.
5. Select "HG" Mixing Tube size from Table 2 based upon the volume of air required.

Example:

- Required heat release of 7,000,000 Btu/hr
- For system measured with 13.5% oxygen in air stream

From Table 1 (13 to 13.9%, middle column)

A. Gross heat required

$$7,000,000 \times 1.075 = 7,525,000 \text{ Btu/hr}$$

B. $\frac{7,525,000 \text{ Btu}}{700,000 \text{ Btu/ft}} = 10.75 \text{ ft.} = 11 \text{ ft. of burner}$

C. $\frac{11 \text{ ft}}{6 \text{ ft/inlet}} = 2 \text{ inlets}$

Table 2: Series "HG" Mixing Tube Selection

"HG" Mixing Tube Size	SCFM combustion air volume required at maximum through "HG" Mixing Tube
2"	0 to 190
3"	90 to 260
4"	175 to 500
6"	400 to 1167
8"	880 to 2500

D. 11 ft. x 41 SCFM/ft = 451 SCFM primary air with differential pressure = 6.4" wc

From Table 2 (301 - 520 SCFM)

E. Select 6" HG Mixing Tube with 12 each 29/64 gas orifices per catalog page 3211

F. Select MICRO-RATIO® Control Valve
– for 451 SCFM air = (27060 SCFH)
– for 7525 SCFH natural gas

Capacity/Selection Data

Series "HG" Mixing Tubes with LO-NOX™ Burners

Fresh and recirculated air streams may be heated with LO-NOX™ Burners supplied with a full premixture of air and natural or propane gas.

A complete burner system to handle these difficult applications would include a LO-NOX™ Burner assembly, Series "HG" Mixing Tube, MICRO-RATIO® Control Valve and a combustion air blower. Your Maxon representative can help you select from the broad range of options available.

General Selection Procedure:

1. Calculate gross heat requirement.
2. Determine burner footage and inlet feed requirements.
3. Enter Table 1 under column with your capacity needs for parameters of your application.
4. Select "HG" Mixing Tube size from Table 2 based upon the volume of air required.

Example:

- Required heat release of 7,000,000 Btu/hr

From Table 1

A. Gross heat required: 7,000,000 Btu/hr

B.
$$\frac{7,000,000 \text{ Btu}}{500,000 \text{ Btu/ft}} = 14 \text{ ft}$$

C. 14 ft x 100 SCFM/ft = 1400 SCFM primary air with differential mixture pressure = 14" wc

From Table 2

D. Since single 8" HG Mixing Tube is rated for a maximum of 2500 SCFM, this requires (1) 8" HG Mixing Tube with gas orifices per catalog page 3211

E. Select MICRO-RATIO® Control Valve
 – For 1400 SCFM air = (84,000 SCFH)
 – For 7000 SCFH natural gas

Table 1: Design Parameters

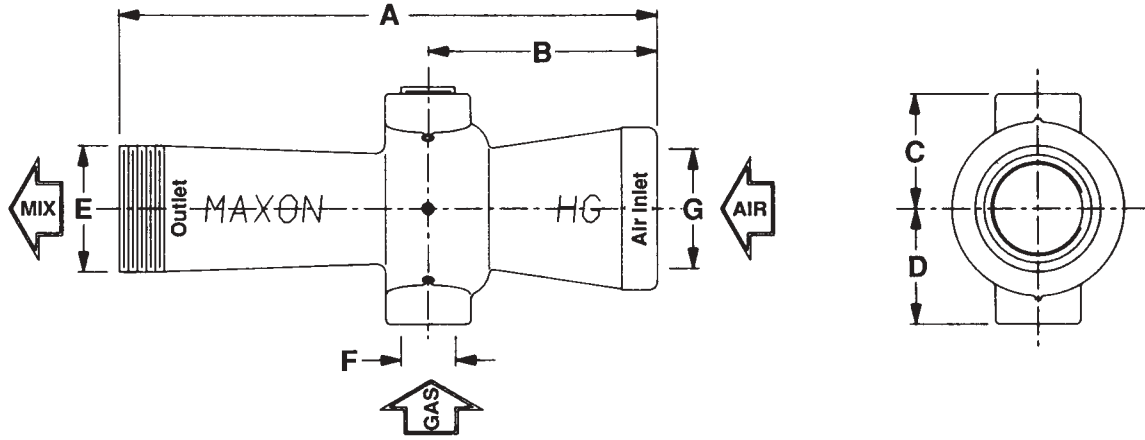
Maximum capacity heat release Btu/hr per lineal foot of LO-NOX™ Burner	Combustion air required through HG Mixing Tube (SCFM per lineal foot of LO-NOX™ Burner)	Differential mixture pressure (inches w.c.) as measured between burner inlet and duct/chamber static pressure
200,000	40	2.5
300,000	60	3.5
400,000	80	6.5
500,000	100	10
550,000	120	11

Table 2: Series "HG" Mixing Tube Selection

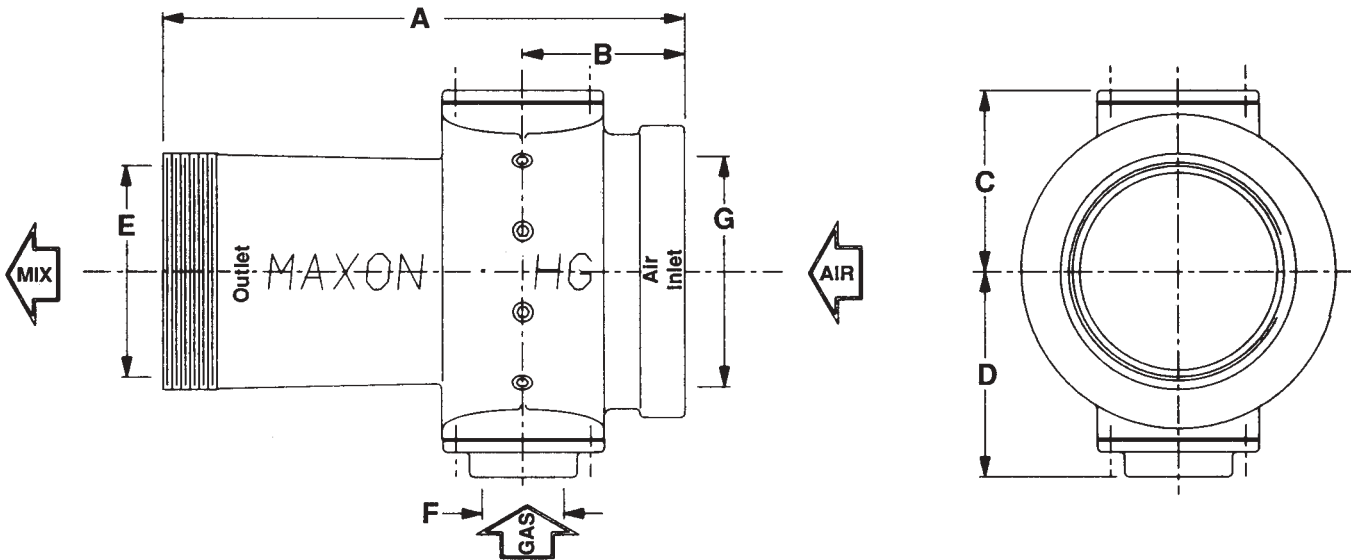
HG Mixing Tube Size	SCFM combustion air volume required at maximum through HG Mixing Tube
2"	0 to 190
3"	90 to 260
4"	175 to 500
6"	400 to 1167
8"	880 to 2500

Dimensions (in inches) Series "HG" Mixing Tubes

2", 3", 4" Sizes



6", 8" Sizes

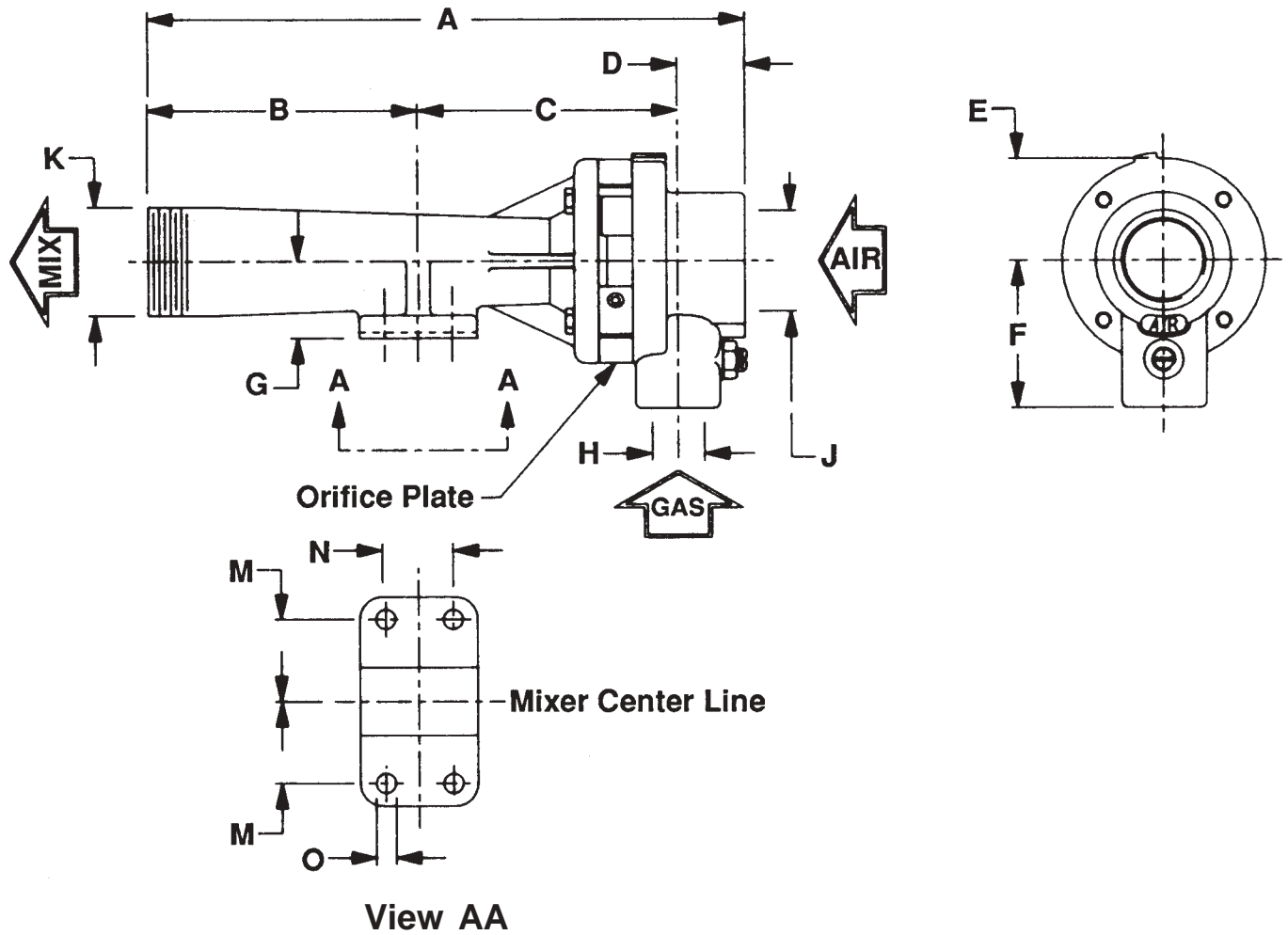


Size	A	B	C	D	E outlet	F gas inlet	G air inlet
2"	10	4.25	2.75	2.5	2"	1"	2"
3"	15	6.38	3.88	3.19	3"	1-1/4"	3"
4"	20	11.19	3.44	3.81	4"	1-1/2" [1]	4"
6"	14.5	4.5	5	5.63	6"	2" [1]	6"
8"	19.5	4.63	5.25	5.88	8"	2-1/2" [1]	8" [1]

[1] Connection is threaded flange. All others threaded body.

Pipe threads on this page conform to NPT (ANSI Standard B2.1)

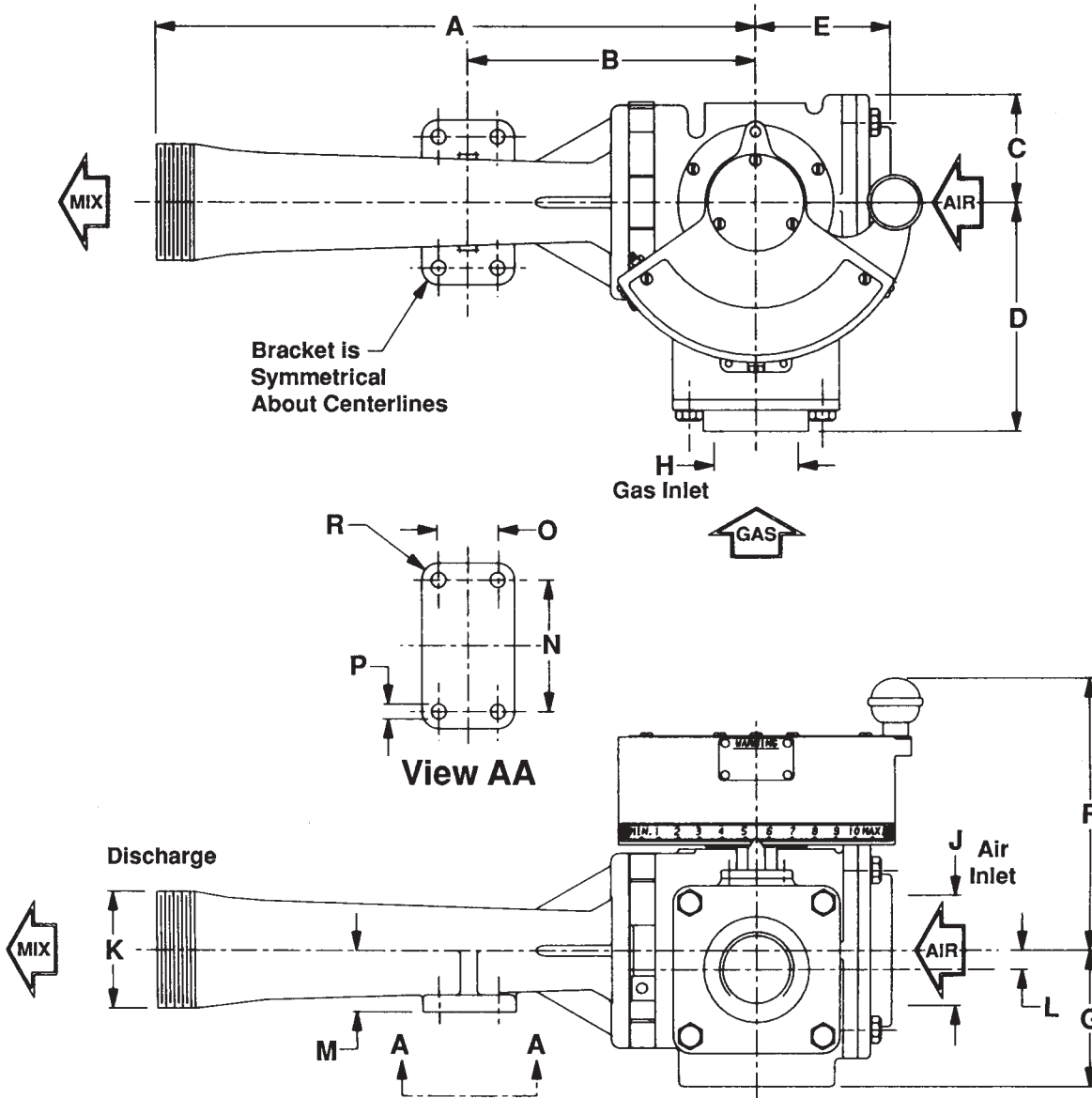
Dimensions (in inches) Series "LG" Mixing Tubes



LG Mixing Tube	A	B	C	D	E	F	G	H gas inlet	J air inlet	K outlet	M	N	O	R
LG-75	8.88	---	---	1.44	1.69	2.38	---	1/2	1-1/4	3/4	---	---	---	---
LG-100	9.88									1				
LG-125	10.88									1-1/4				
LG-150	12.25	5	5.75	1.5	2.25	3.25	1.5	1	2	1-1/2	1.81	1.5	.44	.5
LG-200	13.25	6					2							
LG-300	17.5	9.25	6.84	1.41	2.88	4.38	1.81	1-1/2	3	3	1.94	1.75	.56	.62
LG-400	22.5	12	8.44	2.06		5.38	2.31	2	4	4	2.38	2		
LG-500	26.5	16					2.38			5	2.62	2.25		

Pipe threads on this page conform to NPT (ANSI Standard B2.1)

Dimensions (in inches) MULTI-RATIO™ Mixers

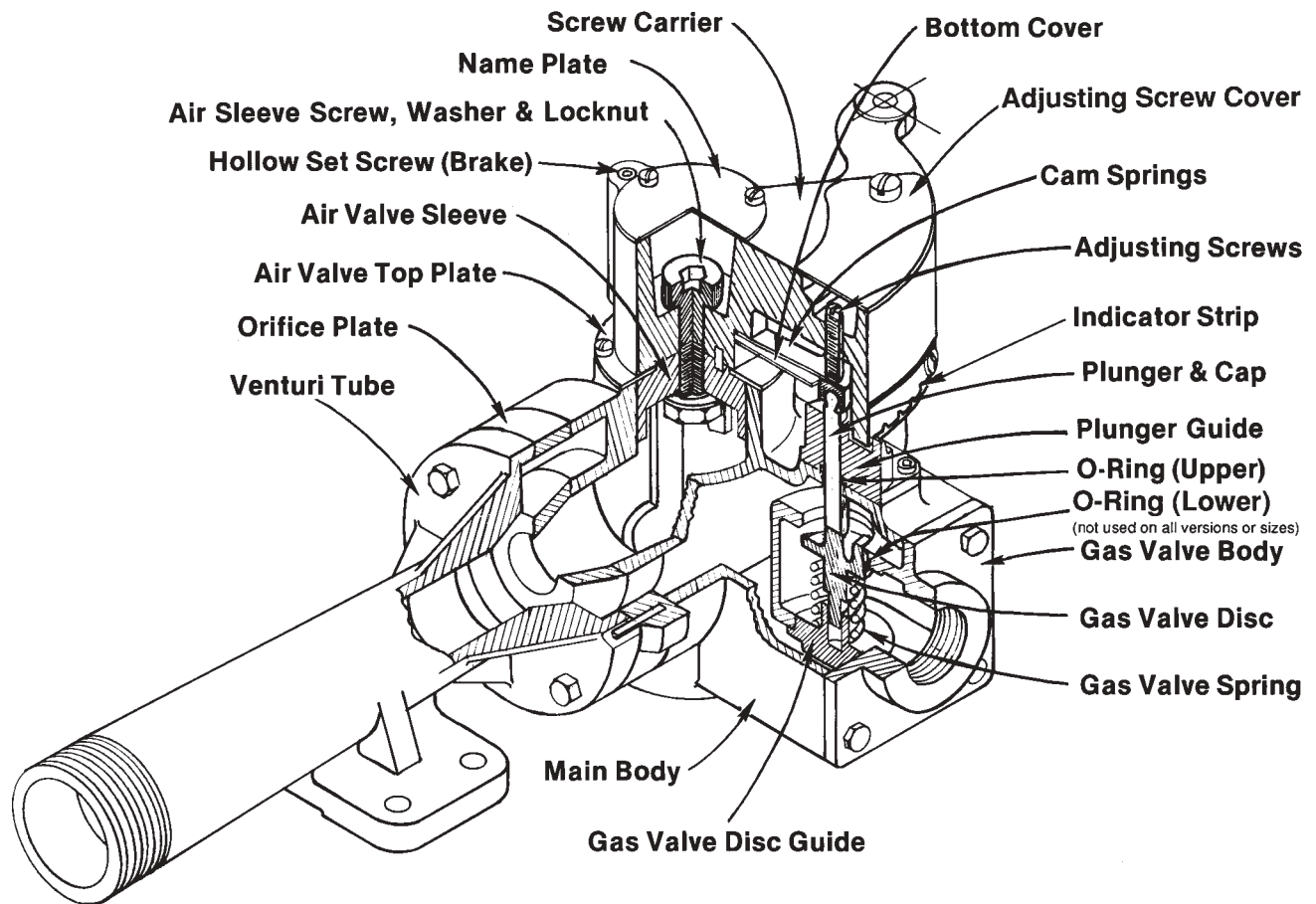


MULTI-RATIO™ Mixer Size	A	B	C	D	E	F	G	H gas inlet	J air inlet	K outlet	L	M	N	O	P	R
MR-75	9.38									3/4						
MR-100	10.38	---	1.75	3.19	2.31	5.62	2.88	3/4	1-1/4	1	.56	---	---	---	---	---
MR-125	11.38									1-1/4						
MR-150	12.38	7.38	1.88	5.19	2.69	6.56	3.06	1-1/4	2	1-1/2	.69	1.5	3.62	1.5	.44	.5
MR-200	13.38				2					2		1.69				
MR-300	17.75	8.5			4	8.06	3.94	2	3	3	.56	1.81	3.88	1.75	.56	.62
MR-400	21.75	9.75	2.94	6.75	4.12					4		2.62				
MR-500	25.75										4	5		2.62	5.25	2.25

Pipe threads on this page conform to NPT (ANSI Standard B2.1)

Component Identification

MULTI-RATIO™ Mixers



Suggested spare parts:

- Cam springs
- Plunger and cap assembly
- O-Ring assembly

To order replacement parts:

1. Specify parts by the names shown in the sketch above
2. Indicate quantity desired
3. Indicate burner size and assembly number from burner nameplate (sample at right),
4. If available, indicate serial number stamped on nameplate of Maxon Shut-Off Valve used with this mixer

Nameplate



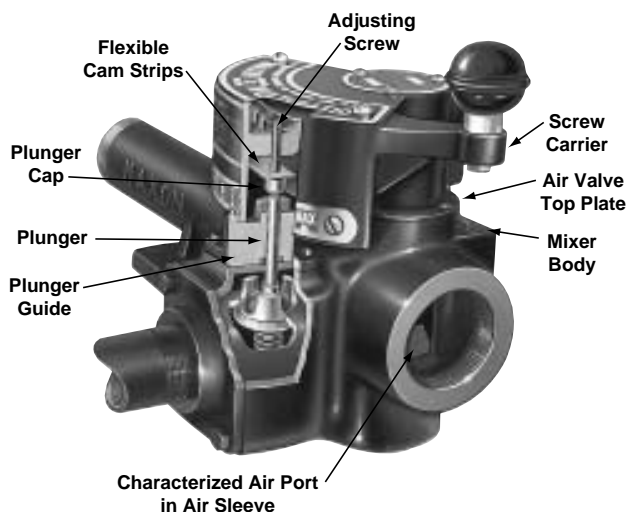
Suggested Maintenance/Inspection Procedures for MULTI-RATIO™ Mixers

Preventive maintenance will help your MULTI-RATIO™ Mixer maintain the accurate air/fuel ratio control it is designed to provide. To overcome the dirt, grease or scale accumulations that may build up internally, we suggest you establish a periodic maintenance schedule based on experience and the severity of your operating conditions, and perform periodic air/valve cleaning as outlined below:

1. Shut down combustion system both electrically and mechanically (by closing gas cocks, etc.).
2. Disconnect control motor linkage at the mixer screw carrier (so that adjustment will be unchanged after re-assembly).
3. Remove the four screws which hold air valve top plate onto mixer body. (To reach all four, screw carrier must be rotated from one extreme position to the other.)
4. Lift screw carrier and air valve out of mixer body, exposing plunger and cap assembly.
5. Clean accumulated dirt from air valve sleeve and mixer body.

WARNING: A surface lubricant such as spray graphite must coat surfaces of air valve and body for smooth operation. After cleaning parts thoroughly, apply spray graphite and allow at least 10-15 minutes drying before re-assembling. DO NOT USE PETROLEUM BASE LUBRICANTS.

6. Remove, clean and inspect plunger and cap assembly. If cap is missing or does not swivel freely, replace entire plunger and cap assembly.
7. Re-insert plunger and cap into plunger guide and check for free movement. If operation is erratic or plunger sticks, replace plunger and cap assembly.



8. Turn screw carrier over and inspect the cam springs mounted inside. Replace the cam springs if they are not smooth and free of scratches or gouges. If they are in good condition, lubricate with light grease or petroleum jelly.
9. Return screw carrier and air valve assembly to mixer body, then replace the four hold-down screws and tighten air valve top plate securely.
10. Observe several operating cycles for proper firing. Refine adjustment of adjusting screws if necessary.
11. Reconnect automatic control linkage and place system back in operation.