fives north american

3065- -S ASPIRATOR MIXERS Specifications

Supplement 3065-1

Ref: Bulletin 3065, Dimensions 3065

May 1992

3065- -S Aspirator Mixers have oversize throats for greater-than-standard air capacities and mixture pressures. They are useful where:

1. Burner capacity does not match a standard mixer size, e.g., certain line burner assemblies and special bore nozzles.
2. Mixture line size is restricted, and use of a standard mixer the same pipe size would prevent combustion system from reaching full capacity, e.g., a tilting melter with mixture line passing through a trunnion.
3. A modest increase in combustion system capacity is desired without extensive repiping.

Increasing mixer capacity involves sacrificing suction efficiency. If air pressure drop across mixer is less than $^2/_3$ air supply pressure, cross-connect zero governor to air line. **Note:** When cross-connecting zero governor to air line, inlet gas pressure to zero governor must be equal to air pressure plus pressure drop across governor. **Mixer should be sized for an air pressure drop of at least $^1/_3$ the supply pressure.**

When feeding several nozzles from one 3065- -S Mixer, a mixture manifold at least one pipe size larger than the mixer outlet is recommended.

Mixer and Nozzle Selection. If only the mixer throat is enlarged, mixture pressure and flow increase. For greater flow, enlarge the nozzle area by the same percent. Refer to capacity chart on page 2. Available pressure drop across mixer is air pressure at mixer inlet minus maximum required mixture pressure. Flow through mixer is nearly proportional to throat area, so capacity of an unlisted mixer-rod combination can be determined by comparing its net throat area with that of a known model. (See Example B and Tables 1, 2, and 3.)

Example A: Select a mixer for a 4682-6-C Nozzle with 8 osi air and 8"wc mixture pressure. This arrangement necessitates a cross-connected regulator and high gas pressure.

Capacity of a 4682-6-C at 8"wc mp is 1 200 000 Btu/hr. Pressure drop across the mixer = 8 osi (14"wc) minus 8"wc mp = 6"wc. From the capacity chart, a 3065-6-S0 Mixer would serve the purpose, as would a 3065-7 with a rod just smaller than a #18. For minimum cost and size use the 3065-6-S0 Mixer.

Example B: Select a mixer for a 2 300 000 Btu/hr line burner with 8 osi air and 4"wc mp. Pressure drop across the mixer = 8 osi (14"wc) minus 4"wc mp = 10"wc.

From the capacity chart, a 3065-8 with between a #56 and a #64 rod or a 3065-7-S with between no rod and a #38 rod (21 000 cfh capacity) could be used. For minimum cost and size, use a 3065-7-S?. Outlet pipe must be one size larger than mixer outlet. For rod size:

$$\frac{\text{A, Throat area, unknown mixer}}{\text{Throat area, known mixer}} = \frac{\text{Capacity, unknown mixer}}{\text{Capacity, known mixer}}$$

Effective mixer throat area = body throat area minus rod cross sectional area. For a 3065-7-S38, throat area = 3.758 – 1.108 = 2.650 sq. in.

$$\frac{A}{2.650} = \frac{23\,000}{21\,000}$$; **A = 2.90 sq in. Rod size = 3.758 minus 2.900 = 0.858 sq. in.; use a #34 rod, a 3065-7-S34 Mixer.**

TABLE 1. Cross Section Areas of Displacement Rods
(Rod number is its diameter in 32nds of an inch)

Rod size	Area, sq. in.	Rod size	Area, sq. in.	Rod size	Area, sq. in.
4	0.012	16	0.196	38	1.108
5	0.019	17	0.222	40	1.227
6	0.028	18	0.249	44	1.485
7	0.038	20	0.307	48	1.767
8	0.049	22	0.371	52	2.074
9	0.062	24	0.442	56	2.405
10	0.077	26	0.518	60	2.761
11	0.093	28	0.601	64	3.142
12	0.110	30	0.690	68	3.547
13	0.130	32	0.785	72	3.976
14	0.150	34	0.887	80	4.909
15	0.173	36	0.994		

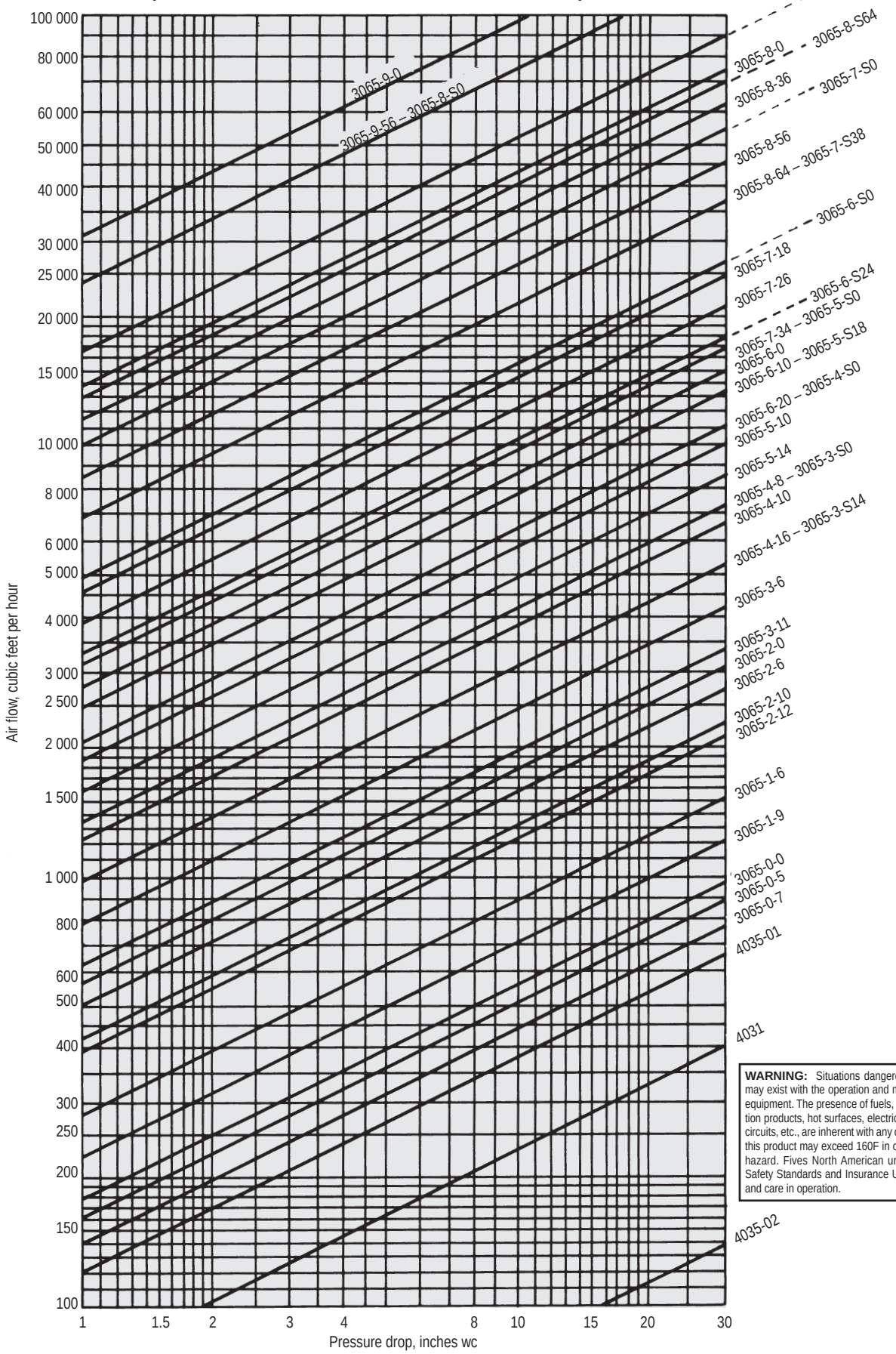
TABLE 2. Available Rod Sizes
(Sizes 4 through 15 solid--others tubular)

Mixer	
3065-0	5, 6, 7, 8, 9
3065-1	4, 5, 6, 8, 9, 10, 11
3065-2	4, 5, 6, 8, 9, 10, 11, 12, 13
3065-3	4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
3065-4	5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18
3065-5	6, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18
3065-6	6, 7, 9, 10, 12, 13, 14, 15, 16, 18, 20, 22, 24
3065-7	4, 10, 12, 14, 15, 16, 18, 20, 24, 26, 28, 30, 32, 34, 36, 38
3065-8	15, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72
3065-9	24, 32, 40, 48, 56, 64, 72, 80

TABLE 3. Mixer Body Throat Sizes

Mixer size	Throat diameter, inches	Throat area, sq. in.	Mixer size	Throat diameter, inches	Throat area, sq. in.
3065-0	$^3/_8$	0.110	**3065-5-S**	$1^1/_4$	1.227
3065-1	$^7/_{16}$	0.150	**3065-6**	$1^9/_{32}$	1.290
3065-2	$^{19}/_{32}$	0.277	**3065-6-S**	$1^{19}/_{32}$	1.990
3065-3	$^{23}/_{32}$	0.406	**3065-7**	$1^3/_4$	2.405
3065-3-S	$^{27}/_{32}$	0.559	**3065-7-S**	$2^3/_{16}$	3.758
3065-4	$^{29}/_{32}$	0.645	**3065-8**	$2^3/_4$	5.940
3065-4-S	1	0.785	**3065-8-S**	$3^5/_{16}$	8.618
3065-5	$1^1/_{16}$	0.887	**3065-9**	$3^{11}/_{16}$	10.680

Air Capacities for North American 3065 and 3065- -S Aspirator Mixers



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. Parts of this product may exceed 160F in operation and present a contact hazard. Fives North American urges compliance with National Safety Standards and Insurance Underwriters recommendations, and care in operation.

Fives North Amercian Combustion, Inc., 4455 East 71st Street, Cleveland, OH 44105 USA, Phone 216.271.6000
Fax 216.641.7852 email: fna.sales@fivesgroup.com • www.fivesgroup.com/fivesna