

TECHNICAL DATA



EDUCTOR/NOZZLE FLOW

This chart is designed to help you better understand the performance of portable foam eductors at various operating pressures. It will also assist you in selecting a nozzle that will be compatible with your new eductor.

As you can see, all of these eductors achieve their rated flow with an inlet pressure of 200 psi. At lower pressures the water flow is less, but the flow of foam concentrate will remain the same. Consequently, the foam solution will be a richer mixture than the metering valve indicates.

You will also note that at lower pressures (flows) the effective reach of the nozzles decreases. Take this into consideration when making your initial attack.

Eductor Model	Recommended Nozzles For Use With Eductor	Hose Size	Inlet Pressure	Flow Rate ♥		Maximum Hose Lay*	Nozzle Pressure	Effective Reach**	
				GPM	L/Min.				
241-30	SFS-O or SFS-OG (Set @ 30), 4000-02 (30) PSFS-HP, PSFS-HPG & TPSFS-HP (Set @ 30)	1.0"	200 PSI	30	114	100'	100 PSI	74'	
			150 PSI	26	98	100'	75 PSI	63'	
			100 PSI	21	79	100'	49 PSI	57'	
	SM-3F, SM-3FG	1.0"	200 PSI	30	114	100'	95PSI	65'	
			—	—	—	—	—	—	
			—	—	—	—	—	—	
241-60 or 240-60	SFL-O or SFL-OG (Set @ 60), 4000-10 (60), 4000-13 (60)	1.5"	200 PSI	60	227	300'	100 PSI	87'	
			150 PSI	52	197	300'	75 PSI	77'	
			100 PSI	42	159	300'	49 PSI	65'	
	SM-10F, SM-10FG, SM-10FB	1.5"	200 PSI	60	227	300'	92 PSI	82'	
			—	—	—	—	—	—	
			—	—	—	—	—	—	
241-95 or 240-95	SFL-O or SFL-OG (Set @ 95), SFL-B or SFL-BG (Set @ 95), SFL-N (95), SFL-GN (95), SFM-HP or SFM-HPG (Set @ 95) SFM-LP or SFM-LPG (Set @ 95) 4000-10 (95), 4000-13 (95)	1.5"	200 PSI	95	360	150'	100 PSI	99'	
			150 PSI	82	310	150'	75 PSI	92'	
			100 PSI	67	254	150'	50 PSI	77'	
		1.75"	200 PSI	95	360	250'	100 PSI	99'	
			150 PSI	82	310	250'	75 PSI	92'	
			100 PSI	67	254	250'	50 PSI	77'	
	SM-10F, SM-10FG, SM-10FB	1.5"	200 PSI	95	360	150'	99 PSI	86'	
			—	—	—	—	—	—	
			—	—	—	—	—	—	
		1.75"	200 PSI	95	360	250'	99 PSI	86'	
			—	—	—	—	—	—	
			—	—	—	—	—	—	
	SM-20F, SM-20FG ♦	1.5"	200 PSI	95	360	200'	81 PSI	97'	
			—	—	—	—	—	—	
			—	—	—	—	—	—	
		1.75"	200 PSI	95	360	400'	81 PSI	97'	
			—	—	—	—	—	—	
			—	—	—	—	—	—	
241-125 or 240-125	SFL-O or SFL-OG (Set @ 125), SFL-B or SFL-BG (Set @ 125), SFL-N (125), SFL-GN (125), SFM-HP or SFM-HPG (Set @ 125) SFM-LP or SFM-LPG (Set @ 125) 4000-10 (125), 4000-13 (125)	1.75"	200 PSI	125	473	150'	100 PSI	101'	
			150 PSI	108	409	150'	75 PSI	92'	
			100 PSI	88	333	150'	50 PSI	76'	
		2.0"	200 PSI	125	473	300'	100 PSI	101'	
			150 PSI	108	409	300'	75 PSI	92'	
			100 PSI	88	333	300'	50 PSI	76'	
	SM-20F, SM-20FG ♦	1.75"	200 PSI	125	473	200'	87 PSI	96'	
			—	—	—	—	—	—	
			—	—	—	—	—	—	
		2.0"	200 PSI	125	473	400'	87 PSI	96'	
			—	—	—	—	—	—	
			—	—	—	—	—	—	
241-150	4000-14 } (150@75) 4000-16 } 4000-17 }	1.75"	200 PSI	150	568	150'	75 PSI	110'	
			150 PSI	130	492	150'	56 PSI	92'	
			100 PSI	106	401	150'	37 PSI	76'	
		SFM-LP or SFM-LPG (Set @ 150)	2.0"	200 PSI	150	568	300'	75 PSI	110'
				150 PSI	130	492	300'	56 PSI	92'
				100 PSI	106	401	300'	37 PSI	76'
	SM-20-FLP SM-20-FGLP ♦	1.75"	200 PSI	150	568	150'	75 PSI	110'	
			—	—	—	—	—	—	
			—	—	—	—	—	—	
		2.0"	200 PSI	150	568	300'	75 PSI	110'	
			—	—	—	—	—	—	
			—	—	—	—	—	—	
241-250	Any SF Series (Set @ 250) or any 4000-20 Series (250)	2.5"	200 PSI	250	946	200'	100 PSI	120'	
			150 PSI	217	821	200'	75 PSI	105'	
			100 PSI	177	670	150'	50 PSI	83'	
	Any SM-30 Series	2.5"	200 PSI	250	946	200'	91 PSI	124'	
			—	—	—	—	—	—	
			—	—	—	—	—	—	

* Maximum hose lay from eductor discharge to nozzle. We recommend that you test your hose to see if this is applicable.

** These figures are with foam solution flowing (rather than plain water) and the nozzle set on straight stream.

♥ Total flow when picking-up 6% foam concentrate through metering valve.

♦ SM-30F and SM-30FG can also be utilized with these eductors. Flow and reach data will differ.

The flow and effective reach data found on the following pages is compiled and updated by our engineering staff in the testing area of our assembly department. The flow is determined by an electronic flowmeter while a piezometer gauge at the base/inlet of the nozzle establishes the "nozzle pressure."

The effective reach is determined by elevating the nozzle to 32 degrees above horizontal and at a height of 4' above ground level. The reach of Straight Stream, Narrow Fog (30 degrees) and Wide Fog (90 degrees) are then established by measuring where the last water droplets are falling at ground level. These tests are conducted in "still air" conditions, so the actual results will vary depending upon conditions.

Catalog No.	GPM	Stream Setting	Discharge in U.S. GPM								Effective Reach in Feet							
			Nozzle Pressure PSI								Nozzle Pressure PSI							
			40	50	75	100	125	150	175	200	40	50	75	100	125	150	175	200
4000-01	15	SS	—	—	—	—	—	—	—	—	—	48	56	58	61	63	65	66
		Narrow Fog	9	11	12	15	17	18	20	22	—	20	22	24	26	28	31	32
		Wide Fog	—	—	—	—	—	—	—	—	—	11	14	15	17	19	21	22
4000-02	30	SS	—	—	—	—	—	—	—	—	—	65	70	81	85	90	91	92
		Narrow Fog	20	22	26	30	34	37	39	41	—	30	35	41	44	47	48	49
		Wide Fog	—	—	—	—	—	—	—	—	—	15	16	19	21	23	25	26
4000-03	45	SS	—	—	—	—	—	—	—	—	—	69	75	85	91	96	98	101
		Narrow Fog	32	35	40	45	49	52	56	58	—	32	37	44	46	48	50	51
		Wide Fog	—	—	—	—	—	—	—	—	—	17	18	21	23	25	26	28
4000-10	60	SS	—	—	—	—	—	—	—	—	69	76	89	96	104	110	115	124
		Narrow Fog	38	43	51	60	68	76	—	—	38	41	44	49	55	61	66	71
		Wide Fog	—	—	—	—	—	—	—	—	31	33	35	41	43	47	51	58
4000-11	75	SS	—	—	—	—	—	—	—	—	73	81	94	103	111	118	—	—
		Narrow Fog	53	58	65	75	84	92	—	—	39	41	45	52	57	62	—	—
		Wide Fog	—	—	—	—	—	—	—	—	29	30	31	33	37	40	—	—
4000-12	95	SS	—	—	—	—	—	—	—	—	77	86	101	111	118	126	130	138
		Narrow Fog	63	68	83	95	107	115	—	—	40	41	46	55	59	64	67	70
		Wide Fog	—	—	—	—	—	—	—	—	29	30	33	36	40	44	47	51
4000-13	125	SS	—	—	—	—	—	—	—	—	78	86	103	113	121	128	138	146
		Narrow Fog	82	91	110	125	140	153	—	—	44	48	55	62	67	71	77	84
		Wide Fog	—	—	—	—	—	—	—	—	32	36	39	44	49	52	56	59
4000-14	150	SS	—	—	—	—	—	—	—	—	80	89	108	124	138	148	156	162
		Narrow Fog	97	107	132	150	169	182	—	—	46	51	53	56	58	60	62	64
		Wide Fog	—	—	—	—	—	—	—	—	34	37	43	46	48	51	52	55
4014-HR	175 @ 50	SS	—	—	—	—	—	—	—	—	91	101	117	132	148	—	—	—
		Narrow Fog	157	175	214	247	277	—	—	—	51	54	61	73	78	—	—	—
		Wide Fog	—	—	—	—	—	—	—	—	34	36	40	44	48	—	—	—
4000-20	175	SS	—	—	—	—	—	—	—	—	88	98	114	126	141	152	—	—
		Narrow Fog	111	124	150	175	192	210	—	—	47	51	59	69	76	81	—	—
		Wide Fog	—	—	—	—	—	—	—	—	32	34	36	39	44	48	—	—
4000-21	200	SS	—	—	—	—	—	—	—	—	88	91	101	117	132	148	—	—
		Narrow Fog	127	141	173	200	224	245	—	—	49	51	54	61	73	78	—	—
		Wide Fog	—	—	—	—	—	—	—	—	33	34	36	40	44	48	—	—
4000-22	250	SS	—	—	—	—	—	—	—	—	91	102	118	136	152	164	—	—
		Narrow Fog	172	192	230	256	290	320	—	—	53	56	62	70	79	83	—	—
		Wide Fog	—	—	—	—	—	—	—	—	35	40	43	47	51	54	—	—
4000-23	325	SS	—	—	—	—	—	—	—	—	97	108	126	142	160	173	—	—
		Narrow Fog	220	240	289	325	362	398	—	—	57	61	67	75	86	89	—	—
		Wide Fog	—	—	—	—	—	—	—	—	39	43	47	52	55	59	—	—
4000-24	350	SS	—	—	—	—	—	—	—	—	97	108	126	142	154	—	—	—
		Narrow Fog	221	247	303	350	391	—	—	—	57	61	67	77	84	—	—	—
		Wide Fog	—	—	—	—	—	—	—	—	39	43	47	52	56	—	—	—
4000-25	*125 @ 75 PSI	SS	—	—	—	—	—	—	—	—	79	88	106	122	135	145	—	—
		Narrow Fog	91	102	125	144	161	176	—	—	45	50	52	55	57	59	—	—
		Wide Fog	—	—	—	—	—	—	—	—	34	37	43	46	48	51	—	—
4000-26	*150 @ 75 PSI	SS	—	—	—	—	—	—	—	—	82	91	110	126	140	150	—	—
		Narrow Fog	110	122	150	173	194	212	—	—	47	52	54	57	59	61	—	—
		Wide Fog	—	—	—	—	—	—	—	—	34	37	43	46	48	51	—	—
4000-27	175 @ 75 PSI	SS	—	—	—	—	—	—	—	—	85	94	113	130	—	—	—	—
		Narrow Fog	128	143	175	202	—	—	—	—	49	54	56	59	—	—	—	—
		Wide Fog	—	—	—	—	—	—	—	—	35	38	44	47	—	—	—	—
4000-28	150 @ 50 PSI	SS	—	—	—	—	—	—	—	—	87	96	115	133	—	—	—	—
		Narrow Fog	134	150	184	212	—	—	—	—	50	55	57	60	—	—	—	—
		Wide Fog	—	—	—	—	—	—	—	—	35	38	44	47	—	—	—	—

PHANTOM®	Catalog No.	GPM	Stream Setting	Discharge in U.S. GPM							Effective Reach in Feet							
				Nozzle Pressure PSI							Nozzle Pressure PSI							
				40	50	75	100	125	150	175	200	40	50	75	100	125	150	175
SFM-HP SFM-HPG TSFM-HP TSFM-HPT	30	SS	SS															
			Narrow Fog	20	22	26	30	34	37	—	—	63	65	70	81	85	90	—
	95	SS	Wide Fog															
			Narrow Fog	63	68	83	95	107	115	—	—	28	30	35	41	44	47	—
	125	SS	Wide Fog															
			Narrow Fog	82	91	110	125	140	153	—	—	14	15	16	19	21	23	—
	150	SS	Wide Fog															
			Narrow Fog	82	91	110	125	140	153	—	—	78	87	103	114	122	130	—
	200	SS	Wide Fog															
			Narrow Fog	97	107	132	150	169	182	—	—	43	45	51	60	66	70	—
	L-205-BA	40	SS	Wide Fog														
				Narrow Fog	126	141	173	200	224	245	—	—	31	33	36	41	43	47
60		SS	Wide Fog															
			Narrow Fog	97	107	132	150	169	182	—	—	80	89	107	120	125	140	—
95		SS	Wide Fog															
			Narrow Fog	126	141	173	200	224	245	—	—	46	49	55	64	70	74	—
125		SS	Wide Fog															
			Narrow Fog	97	107	132	150	169	182	—	—	33	35	38	43	45	49	—
125 @ 75 PSI		SS	Wide Fog															
			Narrow Fog	126	141	173	200	224	245	—	—	88	97	115	130	135	150	—
205-BA		170	SS	Wide Fog														
				Narrow Fog	126	141	173	200	224	245	—	—	52	54	63	72	78	82
	250	SS	Wide Fog															
			Narrow Fog	126	141	173	200	224	245	—	—	36	39	42	47	49	53	—
	125 @ 75 PSI	SS	Wide Fog															
			Narrow Fog	126	141	173	200	224	245	—	—	76	83	100	107	115	120	125
	200 @ 75 PSI	SS	Wide Fog															
			Narrow Fog	126	141	173	200	224	245	—	—	41	45	55	65	70	75	85
	200 @ 50	SS	Wide Fog															
			Narrow Fog	126	141	173	200	224	245	—	—	28	30	36	43	44	45	60

SELECT-O-FLOW®	Catalog No.	GPM	Stream Setting	Discharge in U.S. GPM						Effective Reach in Feet								
				Nozzle Pressure PSI						Nozzle Pressure PSI								
				50	75	100	150	200	300	400	500	50	75	100	150	200	300	400
SFS-O Series	10	SS	SS															
			Narrow Fog	5	7	10	11	12	15	18	20	45	50	53	57	60	61	62
	20	SS	Wide Fog															
			Narrow Fog	15	18	20	24	28	35	41	46	20	21	23	28	31	33	35
	30	SS	Wide Fog															
			Narrow Fog	21	27	30	36	40	50	58	64	11	12	13	15	16	17	19

SELECT-O-FLOW®	Catalog No.	GPM	Stream Setting	Discharge in U.S. GPM						Effective Reach in Feet								
				Nozzle Pressure PSI						Nozzle Pressure PSI								
				40	50	75	100	125	150	175	200	40	50	75	100	125	150	175
SFL-O Series	40	SS	SS															
			Narrow Fog	25	29	34	40	44	48	52	56	59	65	77	83	86	90	93
	60	SS	Wide Fog															
			Narrow Fog	39	44	54	60	70	77	85	92	35	38	41	44	47	50	53
	95	SS	Wide Fog															
			Narrow Fog	59	67	82	95	105	114	123	132	29	34	36	37	39	40	41
125	SS	Wide Fog																
		Narrow Fog	79	88	105	125	140	154	168	182	69	75	90	97	103	110	116	123

TECHNICAL DATA



NOZZLE FLOW

TECHNICAL DATA

T-5

SELECT-O-FLOW®	Catalog No.	GPM	Stream Setting	Discharge in U.S. GPM							Effective Reach in Feet								
				Nozzle Pressure PSI							Nozzle Pressure PSI								
				40	50	75	100	125	150	175	200	40	50	75	100	125	150	175	200
SF TSF DSF STDSF SF-800 STSF-800 STSF-800A	125	Narrow Fog	SS	83	90	110	125	141	153	167	179	70	80	103	122	136	—	—	—
			Wide Fog	33	35	40	45	50	—	—	—	18	20	25	30	35	—	—	—
			SS	86	98	113	127	140	—	—	—	46	50	60	70	75	—	—	—
	175	Narrow Fog	108	120	139	175	194	211	227	244	31	32	35	40	45	—	—	—	
		Wide Fog	81	92	116	133	149	—	—	—	43	46	54	61	68	—	—	—	
	250	Narrow Fog	160	180	218	250	280	304	327	351	28	30	36	40	45	—	—	—	
Wide Fog		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		

SELECT-O-STREAM®	Catalog No.	GPM	Stream Setting	Discharge in U.S. GPM						Effective Reach in Feet									
				Nozzle Pressure PSI						Nozzle Pressure PSI									
				50	75	100	150	200	300	400	500	50	75	100	150	200	300	400	500
S-O Series	12	Narrow Fog	SS	11	13	14	17	18	23	25	29	46	55	59	64	68	73	77	80
			Wide Fog	25	32	34	36	38	42	46	49	15	18	20	23	25	29	33	35
			SS	53	65	75	81	83	84	86	87	40	43	45	55	60	65	70	75
	23	Narrow Fog	20	25	27	32	37	45	52	58	24	26	30	37	39	41	45	48	
		Wide Fog	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	23	Narrow Fog	20	25	27	32	37	45	52	58	24	26	30	37	39	41	45	48	
Wide Fog		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		

SELECT-O-STREAM®	Catalog No.	GPM	Stream Setting	Discharge in U.S. GPM							Effective Reach in Feet									
				Nozzle Pressure PSI							Nozzle Pressure PSI									
				40	50	75	100	125	150	175	200	40	50	75	100	125	150	175	200	
L-O Series	40	Narrow Fog	SS	26	28	35	41	47	51	55	58	53	60	73	61	85	86	86.5	87	
			Wide Fog	37	40	42	43	44	45	48	50	26	28	30	31	32	33	34	35	
			SS	68	75	92	103	110	115	120	123	36	38	45	50	55	60	70	75	
		60	Narrow Fog	39	43	41	60	68	75	81	86	27	28	32	35	38	42	48	54	
			Wide Fog	76	83	100	107	115	120	125	130	41	45	55	65	70	75	85	95	
		95	Narrow Fog	65	73	88	101	112	122	130	136	28	30	36	43	49	55	60	65	
	Wide Fog		91	100	118	130	140	150	155	157	46	50	60	68	75	83	90	95		
	SOS D 800-SOS S	170	Narrow Fog	SS	85	100	122	142	163	—	—	—	84	92	100	108	115	—	—	—
				Wide Fog	103	114	139	162	178	—	—	—	49	55	65	70	75	—	—	—
				SS	139	154	185	213	234	—	—	—	31	32	37	44	47	—	—	—
		250	Narrow Fog	SS	98	108	127	145	160	—	—	—	87	94	105	112	120	—	—	—
				Wide Fog	156	173	210	245	278	—	—	—	56	60	70	75	80	—	—	—
250		Wide Fog	SS	203	225	278	323	368	—	—	—	33	35	40	45	50	—	—	—	
	Wide Fog		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		

SPECIAL USE NOZZLES	Catalog No.	GPM	Stream Setting	Discharge in U.S. GPM						Effective Reach in Feet									
				Nozzle Pressure PSI						Nozzle Pressure PSI									
				50	75	100	150	200	300	400	500	50	75	100	150	200	300	400	500
S-205-BAF	12	Narrow Fog	SS	11	12	14	17	18	23	25	29	46	55	59	64	68	73	77	80
			Wide Fog	25	32	34	36	38	42	46	49	15	18	20	23	25	29	33	35
			SS	53	65	75	81	83	84	86	87	40	43	45	55	60	65	70	75
	23	Narrow Fog	SS	20	25	27	32	37	45	52	58	24	26	30	37	39	41	45	48
			Wide Fog	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	23	Wide Fog	SS	20	25	27	32	37	45	52	58	24	26	30	37	39	41	45	48
Wide Fog			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

SPECIAL USE NOZZLES	Catalog No.	GPM	Stream Setting	Discharge in U.S. GPM							Effective Reach in Feet									
				Nozzle Pressure PSI							Nozzle Pressure PSI									
				40	50	75	100	125	150	175	200	40	50	75	100	125	150	175	200	
SFL-O-DI	40	Narrow Fog	SS	25	29	34	40	44	48	52	56	59	65	77	83	86	90	93	96	
			Wide Fog	35	38	41	44	47	50	53	56	29	34	36	37	39	40	41	43	
			SS	69	75	90	97	103	110	116	123	38	40	45	50	55	60	65	70	
		60	Narrow Fog	SS	39	44	54	60	70	77	85	92	31	32	35	40	44	48	52	57
				Wide Fog	77	85	102	110	117	124	131	183	39	41	47	54	60	63	66	69
		95	Narrow Fog	SS	59	67	82	95	105	114	123	132	28	30	34	38	41	45	49	52
	Wide Fog			77	85	102	110	117	124	131	183	45	48	55	61	66	72	78	83	
	L-205-BAF	20	Narrow Fog	SS	15	17	21	24	27	30	33	36	45	50	60	70	75	80	85	90
				Wide Fog	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
				SS	45	50	62	72	80	88	93	99	78	80	85	90	95	100	105	110
		70	Narrow Fog	SS	46	52	64	74	81	89	94	100	28	30	33	37	40	45	50	55
				Wide Fog	63	70	86	99	111	120	130	140	14	15	16	18	20	22	24	26
70		Wide Fog	SS	63	70	86	99	111	120	130	140	14	15	16	18	20	22	24	26	
	Wide Fog		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		

CELLAR/BRESNAN	Catalog No.	GPM	Stream Setting	Discharge in U.S. GPM								Effective Reach in Feet							
				Nozzle Pressure PSI								Nozzle Pressure PSI							
				40	50	60	70	80	90	100	125	40	50	60	70	80	90	100	125
LR	—	—	—	99	114	124	133	144	154	160	179	—	—	—	—	—	—	—	—
R	—	—	—	227	253	276	296	317	335	353	395	—	—	—	—	—	—	—	—
193-6 (1.5)	—	—	—	91	101	110	117	125	133	140	157	—	—	—	—	—	—	—	—
193-6 (2.5)	—	—	—	262	287	312	335	356	375	394	441	—	—	—	—	—	—	—	—
193-9 (2.5)	—	—	—	325	360	390	419	446	471	495	553	—	—	—	—	—	—	—	—

5000E	Catalog No.	GPM	Stream Setting	Discharge in U.S. GPM								Effective Reach in Feet								
				Nozzle Pressure PSI								Nozzle Pressure PSI								
				40	50	75	100	125	150	175	200	40	50	75	100	125	150	175	200	
5000-04E	15	SS	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
			Narrow Fog	9	11	12	15	17	18	20	22	—	20	22	24	26	28	31	32	
			Wide Fog	—	—	—	—	—	—	—	—	—	11	14	15	17	19	21	22	
	30	SS	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
			Narrow Fog	20	22	26	30	34	37	39	41	—	30	35	41	44	47	48	49	
			Wide Fog	—	—	—	—	—	—	—	—	—	15	16	19	21	23	25	26	
	45	SS	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
			Narrow Fog	32	35	40	45	49	52	56	58	—	32	37	44	46	48	50	51	
			Wide Fog	—	—	—	—	—	—	—	—	—	17	18	21	23	25	26	28	
	5000-14E	60	SS	69	76	89	96	104	110	115	124	—	—	—	—	—	—	—	—	
				Narrow Fog	38	43	51	60	68	76	—	—	38	41	44	49	55	61	66	71
				Wide Fog	31	33	35	41	43	47	51	58	—	—	—	—	—	—	—	—
75		SS	73	81	94	103	111	118	—	—	—	—	—	—	—	—	—	—		
			Narrow Fog	53	58	65	75	84	92	—	—	39	41	45	52	57	62	—	—	
			Wide Fog	29	30	31	33	37	40	—	—	—	—	—	—	—	—	—	—	
95		SS	77	86	101	111	118	126	130	138	—	—	—	—	—	—	—	—		
			Narrow Fog	63	68	83	95	107	115	—	—	40	41	46	55	59	64	67	70	
			Wide Fog	29	30	33	36	40	44	47	51	—	—	—	—	—	—	—	—	
125		SS	78	86	103	113	121	128	138	146	—	—	—	—	—	—	—	—		
			Narrow Fog	82	91	110	125	140	153	—	—	44	48	55	62	67	71	77	84	
			Wide Fog	32	36	39	44	49	52	56	59	—	—	—	—	—	—	—	—	
150	SS	80	89	108	124	138	148	156	162	—	—	—	—	—	—	—	—			
		Narrow Fog	97	107	132	150	169	182	—	—	46	51	53	56	58	60	62	64		
		Wide Fog	34	37	43	46	48	51	52	55	—	—	—	—	—	—	—	—		
5000-24E	175	SS	88	98	114	126	141	152	—	—	—	—	—	—	—	—	—	—		
			Narrow Fog	111	124	150	175	192	210	—	—	47	51	59	69	76	81	—	—	
			Wide Fog	32	34	36	39	44	48	—	—	—	—	—	—	—	—	—	—	
	200	SS	88	91	101	117	132	148	—	—	—	—	—	—	—	—	—	—		
			Narrow Fog	127	141	173	200	224	245	—	—	49	51	54	61	73	78	—	—	
			Wide Fog	33	34	36	40	44	48	—	—	—	—	—	—	—	—	—	—	
	250	SS	91	102	118	136	152	164	—	—	—	—	—	—	—	—	—	—		
			Narrow Fog	172	192	230	256	290	320	—	—	53	56	62	70	79	83	—	—	
			Wide Fog	35	40	43	47	51	54	—	—	—	—	—	—	—	—	—	—	
	350	SS	97	108	126	142	154	—	—	—	—	—	—	—	—	—	—	—		
			Narrow Fog	221	247	303	350	391	—	—	57	61	67	77	84	—	—	—		
			Wide Fog	39	43	47	52	56	—	—	—	—	—	—	—	—	—	—		

R.A.N.™	Catalog No.	GPM	Stream Setting	Discharge in U.S. GPM								Effective Reach in Feet							
				Nozzle Pressure PSI								Nozzle Pressure PSI							
				40	50	60	70	80	90	100	125	40	50	60	70	80	90	100	125
3896 R.A.N.®	500	SS	135	149	162	172	181	188	194	—	—	—	—	—	—	—	—	—	
			Narrow Fog	358	400	443	477	509	540	570	—	92	101	109	117	125	133	140	—
			Wide Fog	48	52	56	60	63	67	71	—	—	—	—	—	—	—	—	—

X-STREAM®	Catalog No.	Inlet Size	Stream Setting	Discharge in U.S. GPM					Effective Reach in Feet						
				Nozzle Pressure PSI					Nozzle Pressure PSI						
				50	60	65	70	75	80	50	60	65	70	75	80
SM-1000 Series	2.5	SS	108	134	165	198	255	—	—	—	—	—	—	—	
			Narrow Fog	113	244	350	500	1000	—	89	94	98	107	124	—
			Wide Fog	47	61	65	68	81	—	—	—	—	—	—	—
	3.5	SS	123	142	176	210	221	241	—	—	—	—	—	—	
			Narrow Fog	130	297	405	530	675	1000	88	90	93	100	115	125
			Wide Fog	55	66	77	90	97	103	—	—	—	—	—	—
SM-1250 Series	2.5	SS	139	182	220	257	271	—	—	—	—	—	—	—	
			Narrow Fog	315	525	630	925	1250	—	105	110	116	119	130	—
			Wide Fog	57	62	69	77	92	—	—	—	—	—	—	—
	3.5	SS	110	140	172	220	229	—	—	—	—	—	—	—	
			Narrow Fog	385	655	875	1100	1250	—	100	129	132	136	140	—
			Wide Fog	56	62	68	72	82	—	—	—	—	—	—	—

TECHNICAL DATA



NOZZLE FLOW

TECHNICAL DATA

T-7

X-STREAM® Catalog No.	Stream Setting	Discharge in U.S. GPM										Effective Reach in Feet										
		Nozzle Pressure PSI										Nozzle Pressure PSI										
		50	60	70	75	80	85	90	95	100	105	110	50	60	70	75	80	85	90	95	100	105
SM-1500 Series SM-2000 Series	SS	—	—	—	—	—	—	—	—	—	—	240	300	—	—	—	—	—	—	—	—	—
	Narrow Fog	500	850	1250	1500	2000	—	—	—	—	—	125	148	—	—	—	—	—	—	—	—	—
	Wide Fog	—	—	—	—	—	—	—	—	—	—	90	100	—	—	—	—	—	—	—	—	—

SELECT-O-STREAM® Catalog No.	GPM	Stream Setting	Discharge in U.S. GPM										Effective Reach in Feet									
			Nozzle Pressure PSI										Nozzle Pressure PSI									
			40	50	60	70	80	90	100	125	40	50	60	70	80	90	100	125				
CJ Series IMS IMS-N	350	SS	—	—	—	—	—	—	—	—	—	—	109	125	131	137	142	146	150	155		
		Narrow Fog	222	250	270	290	310	330	350	390	61	65	69	73	77	82	87	100				
		Wide Fog	—	—	—	—	—	—	—	—	41	45	49	53	56	58	60	65				
	500	SS	—	—	—	—	—	—	—	—	—	—	119	134	142	150	158	165	173	190		
		Narrow Fog	322	360	396	432	464	490	516	580	68	72	77	82	87	92	97	110				
		Wide Fog	—	—	—	—	—	—	—	—	36	40	44	48	52	56	60	70				
CJN CJN-BN CJN-RC CJN-B CJN-B-RC	750	SS	—	—	—	—	—	—	—	—	—	148	170	184	198	212	226	238	236			
		Narrow Fog	496	550	596	640	680	716	750	840	80	89	98	107	117	126	135	159				
		Wide Fog	—	—	—	—	—	—	—	—	58	65	71	77	83	89	95	105				
	1000	SS	—	—	—	—	—	—	—	—	—	159	180	204	225	242	252	263	289			
		Narrow Fog	676	725	800	853	945	962	1000	1153	104	115	125	135	144	152	160	180				
		Wide Fog	—	—	—	—	—	—	—	—	59	66	72	80	88	98	100	118				
SELECT-O-FLOW® CSW CSW-L CSW-LB	300	SS	—	—	—	—	—	—	—	—	—	107	121	130	137	142	147	150	159			
		Narrow Fog	190	210	230	250	270	285	300	330	76	87	97	104	110	115	120	128				
		Wide Fog	—	—	—	—	—	—	—	—	49	54	58	62	65	68	71	78				
		550	SS	—	—	—	—	—	—	—	—	—	135	149	162	172	181	188	194	208		
			Narrow Fog	350	390	425	460	490	520	550	615	92	101	109	117	125	133	140	154			
			Wide Fog	—	—	—	—	—	—	—	—	48	52	56	60	63	67	71	81			
	750	SS	—	—	—	—	—	—	—	—	—	140	165	180	191	202	213	221	252			
		Narrow Fog	480	535	580	625	670	715	750	830	94	104	114	124	133	143	152	172				
		Wide Fog	—	—	—	—	—	—	—	—	46	49	52	54	56	58	60	65				
		500	SS	—	—	—	—	—	—	—	—	—	119	134	142	150	158	165	173	190		
			Narrow Fog	322	360	396	432	464	490	516	580	68	72	77	82	87	92	97	110			
			Wide Fog	—	—	—	—	—	—	—	—	36	40	44	48	52	56	60	70			
750	SS	—	—	—	—	—	—	—	—	—	150	178	191	202	211	222	235	264				
	Narrow Fog	490	540	595	640	680	720	750	845	91	105	117	129	140	150	158	175					
	Wide Fog	—	—	—	—	—	—	—	—	60	64	71	82	90	101	107	112					
	1000	SS	—	—	—	—	—	—	—	—	—	168	192	215	236	251	266	278	291			
		Narrow Fog	645	725	785	845	900	955	1000	—	84	96	108	115	125	136	146	163				
		Wide Fog	—	—	—	—	—	—	—	—	61	69	77	84	91	102	115	119				
1250	SS	—	—	—	—	—	—	—	—	—	180	200	220	240	260	280	350	—				
	Narrow Fog	790	880	960	1035	1100	1160	1250	—	104	120	135	145	155	165	175	—					
	Wide Fog	—	—	—	—	—	—	—	—	71	84	98	112	123	132	140	—					
	J	350	SS	226	251	275	295	314	333	350	390	81	95	105	114	122	129	135	150			
			Narrow Fog	330	366	400	433	463	488	515	574	38	40	42	44	46	48	50	55			
			Wide Fog	396	442	481	515	550	585	615	688	28	30	32	34	36	38	40	45			
500		SS	316	360	398	426	454	480	502	558	106	118	124	129	133	137	141	150				
		Narrow Fog	422	471	516	557	591	625	656	730	69	75	80	83	86	88	90	95				
		Wide Fog	552	614	671	720	765	811	854	956	50	54	57	61	64	68	71	80				
JN	SS	448	498	550	590	630	663	696	—	120	134	142	152	160	165	170	—					
	Narrow Fog	585	652	714	764	813	863	910	—	78	92	100	110	120	128	135	—					
	Wide Fog	740	824	900	971	1039	—	—	—	40	45	55	60	65	—	—	—					
CIK CIK-HP	1250	SS	—	—	—	—	—	—	—	—	130	150	172	191	209	230	266	292				
		Narrow Fog	791	884	968	1046	1118	1186	1250	1398	63	72	83	92	100	110	128	140				
		Wide Fog	—	—	—	—	—	—	—	—	49	57	65	73	79	87	101	111				
		1500	SS	—	—	—	—	—	—	—	—	140	166	190	212	233	255	276	320			
			Narrow Fog	949	1061	1162	1255	1342	1423	1500	1677	67	80	91	102	112	122	132	154			
			Wide Fog	—	—	—	—	—	—	—	—	53	63	72	81	89	97	105	122			
	1750	SS	—	—	—	—	—	—	—	—	150	176	200	224	248	272	296	354				
		Narrow Fog	1107	1237	1356	1464	1565	1660	1750	1957	72	84	96	107	119	131	142	170				
		Wide Fog	—	—	—	—	—	—	—	—	57	67	76	85	94	103	112	135				
		2000	SS	—	—	—	—	—	—	—	—	174	200	224	248	273	298	325	375			
			Narrow Fog	1265	1414	1549	1673	1789	1897	2000	2236	84	96	107	119	131	143	156	180			
			Wide Fog	—	—	—	—	—	—	—	—	66	76	85	94	103	113	124	143			

Catalog No.	GPM	Stream Setting	Discharge in U.S. GPM										Effective Reach in Feet									
			Nozzle Pressure PSI										Nozzle Pressure PSI									
			40	50	60	70	80	90	100	125	40	50	60	70	80	90	100	125				
HF-350* HF-350-A	350	SS	—	—	—	—	—	—	—	—	—	80	95	110	124	134	140	145	155			
		30°-Fog	230	245	260	276	293	309	325	365	42	47	52	57	62	68	73	80				
		90°-Fog	—	—	—	—	—	—	—	—	13	14	15	16	17	18	20	23				
HF-500* HF-500-A	500	SS	—	—	—	—	—	—	—	—	97	110	123	136	145	155	162	175				
		30°-Fog	345	370	390	410	432	455	475	530	52	57	61	66	71	76	80	92				
		90°-Fog	—	—	—	—	—	—	—	—	18	20	22	23	25	27	29	31				

*These flow figures computed with water only. Add 1, 3, 6% for total foam flow.

NOZZLE REACTION FORMULA

STRAIGHT BORE NOZZLES

NR = 1.5 d³NP
 Where NR = Nozzle
 Reaction (Pounds) = Nozzle
 d = Nozzle

Diameter (Inches)

NP = Nozzle
 Pressure (psi)
 1.5 is a constant

COMBINATION FOG NOZZLES

NR = 0.0505 QvP
 Where NR = Nozzle
 Reaction (Pounds) = Flow (GPM)
 P = Nozzle

Pressure (psi at base of nozzle)

0.0505 is a constant
 This formula is with nozzle set on straight stream.
 Reaction will decrease as pattern is widened to fog.

DISCHARGE OF SMOOTH BORE NOZZLES/TIPS

Nozzle Pressure in psi*	Nozzle Diameter in Inches																			
	1/4"	3/8"	7/16"	1/2"	5/8"	3/4"	7/8"	15/16"	1.0"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 5/8"	1 3/4"	1 7/8"	2.0"	2 1/4"	2 1/2"	3.0"
	Gallons Per Minute																			
20	8	18	25	33	51	75	101	115	132	167	206	250	298	350	407	468	532	674	832	1200
22	8	19	26	34	54	79	105	122	139	175	216	263	313	367	427	490	557	707	872	1255
24	8	20	27	36	56	82	110	127	145	183	226	275	327	384	446	512	582	739	910	1311
26	9	21	29	37	59	85	115	133	151	191	235	286	340	400	464	533	606	769	949	1366
28	9	21	30	39	61	89	119	138	157	198	244	297	353	415	481	554	629	799	985	1418
30	10	22	31	40	63	92	123	142	162	205	253	307	365	429	498	572	651	826	1017	1470
32	10	23	32	41	65	95	127	147	167	212	261	317	377	443	514	591	673	854	1050	1515
34	11	23	33	43	67	98	131	152	172	218	269	327	389	457	530	610	693	880	1082	1561
36	11	24	34	44	69	100	135	156	177	224	277	336	400	470	546	627	713	905	1114	1610
38	11	25	35	45	71	103	138	160	182	231	285	345	411	483	561	645	733	930	1144	1650
40	11	26	35	46	73	106	142	165	187	237	292	354	422	496	575	661	752	954	1174	1692
42	11	26	36	47	74	109	146	169	192	243	299	363	432	508	589	678	770	978	1203	1737
44	12	27	37	49	76	111	149	173	196	248	306	372	442	520	603	694	788	1000	1231	1776
46	12	28	38	50	78	114	152	176	200	254	313	380	452	531	617	710	806	1021	1259	1816
48	12	28	39	51	80	116	156	180	205	259	320	388	462	543	630	725	824	1043	1286	1854
50	13	29	40	52	81	118	159	184	209	265	326	396	472	554	643	740	841	1065	1313	1895
52	13	29	40	53	82	121	162	188	213	270	333	404	481	565	656	754	857	1087	1339	1930
54	13	30	41	54	84	123	165	191	217	275	339	412	490	576	668	769	873	1108	1364	1968
56	13	30	42	55	86	125	168	195	221	280	345	419	499	586	680	782	889	1129	1389	2000
58	13	31	43	56	87	128	171	198	225	285	351	426	508	596	692	796	905	1149	1417	2020
60	14	31	43	57	89	130	174	201	229	290	357	434	517	607	704	810	920	1167	1438	2075
62	14	32	44	58	90	132	177	205	233	295	363	441	525	617	716	823	936	1187	1463	2108
64	14	32	45	59	92	134	180	208	237	299	369	448	533	627	727	836	951	1206	1490	2140
66	14	33	46	60	93	136	182	211	240	304	375	455	542	636	738	850	965	1224	1510	2175
68	14	33	46	60	95	138	185	214	244	308	381	462	550	646	750	862	980	1242	1532	2205
70	15	34	47	61	96	140	188	218	247	313	386	469	558	655	761	875	994	1260	1558	2240
72	15	34	48	62	97	142	191	221	251	318	391	475	566	665	771	887	1008	1278	1579	2275
74	15	35	48	63	99	144	193	224	254	322	397	482	574	674	782	900	1023	1296	1600	2300
76	15	35	49	64	100	146	196	227	258	326	402	488	582	683	792	911	1036	1313	1620	2340
78	15	36	50	65	101	148	198	230	261	330	407	494	589	692	803	924	1050	1330	1640	2370
80	16	36	50	66	103	150	201	233	265	335	413	500	596	700	813	935	1063	1347	1665	2400
82	16	37	51	66	104	152	204	235	268	339	418	507	604	709	823	946	1076	1364	1685	2425
84	16	37	51	67	105	154	206	238	271	343	423	513	611	718	833	959	1089	1380	1707	2460
86	16	37	52	68	107	155	208	241	274	347	428	519	618	726	843	970	1102	1396	1723	2485
88	16	38	53	69	108	157	211	244	277	351	433	525	626	735	853	981	1115	1412	1745	2515
90	17	39	53	70	109	159	213	248	280	355	438	531	633	743	862	992	1128	1429	1762	2540
92	17	39	54	70	110	161	215	249	283	359	443	537	640	751	872	1002	1140	1445	1785	2565
94	17	39	54	71	111	162	218	252	286	363	447	543	647	759	881	1012	1152	1460	1802	2600
96	17	40	55	72	113	164	220	255	289	367	452	549	654	767	890	1022	1164	1476	1822	2625
98	17	40	55	73	114	166	223	257	292	370	456	554	660	775	900	1032	1176	1491	1840	2650
100	18	41	56	73	115	168	225	260	295	374	461	560	667	783	909	1043	1189	1506	1860	2680
105	18	42	57	75	118	172	230	266	303	383	473	574	683	803	932	1070	1218	1542	1908	2745
110	19	43	59	77	121	176	236	273	310	392	484	588	699	822	954	1095	1247	1579	1950	2810
115	19	43	60	79	123	180	241	279	317	401	495	600	715	840	975	1120	1275	1615	1995	2875
120	19	44	61	80	126	183	246	285	324	410	505	613	730	858	996	1144	1303	1649	2020	2940
125	20	45	63	82	129	187	251	291	331	418	516	626	745	876	1016	1168	1329	1683	2080	3000
130	20	46	64	84	131	191	256	295	337	427	526	638	760	893	1036	1191	1356	1717	2120	3055
135	21	47	65	85	134	195	262	302	343	435	536	650	775	910	1056	1213	1382	1750	2160	3110
140	21	48	66	87	136	198	266	308	350	443	546	662	789	927	1076	1235	1407	1780	2200	3170
145	21	49	68	88	139	202	271	313	356	450	556	674	803	944	1095	1257	1432	1812	2240	3225
150	22	50	69	90	141	205	275	318	362	458	565	686	817	960	1114	1279	1456	1843	2260	3280
175	24	55	74	97	152	218	298	344	390	494	610	740	883	1030	1200	1380	1572	1985	2460	3540
200	26	59	79	104	162	234	318	368	418	527	653	790	944	1103	1283	1472	1680	2123	2635	3785

* Nozzle pressure measured by pitot tube and gauge.

FORMULA FOR DISCHARGE OF SMOOTH BORE NOZZLES:

$$\text{GPM} = 29.71 d^2 \sqrt{\text{NP}}$$

GPM = Gallons per minute

29.71 = Constant

d = Diameter of nozzle orifice (inches)

NP = Nozzle pressure (psi) measured by pitot tube and gauge



FIRE HOSE FRICTION LOSS

FRICTION LOSS IN RUBBER OR VINYL LINED FIRE HOSE

Flow In U.S. GPM	Pressure Loss in PSI per 100' Hose											Equal Length Siamesed Lines		
	.75"	1.0"	1.5"	1.75"	2.0"	2.5"	3.0"	3.5"	4.0"	5.0"	6.0"	2-2.5"	3-2.5"	2-3.0"
10	13.5	3.5												
20	50	12.5												
30	105	26												
40		44	4.5	3	1									
60		92	10	5	2.5									
95			22	11	5									
100			25	12	6	3	1							
125			37	21	10	4	1							
150			54	26	13.5	6	2							
175				34	18	8	3							
200				45	24	10	4	2						
225				57	30	12	4.5	2						
250				70	37.5	15	6	2.5						
275				82	45	17.5	7	3						
300				95	54	21	8	3.5	2			6	3	2
325					65	24.5	9.5	4	2.5			6.5	3	2.5
350					78	28	11	5	2.5			8	3.5	3
400					96	36	14	6	3	1		10	4.5	4
450						45	17.5	8	4	1.5		12.5	6	5
500						55	21	9.5	5	2		15.5	7	6
550							25.5	11.5	6	2		18.5	8.5	7
600							30	13.5	7	2.5		23	10	8.5
650							35	15.5	8.5	3		25.5	12	10
700							40.5	18	9.5	3.5	1	29.5	13.5	11.5
750							46	20	11.5	4	1	33.5	15.5	13
800							53	23	12.5	4.5	1.5	38	17.5	14.5
850								25.5	14.5	5	1.5	43	20	16.5
900								28	16	5.5	2	48	22.5	18.5
950								31	17.5	6	2		25	20.5
1000								34	19	6.5	2.5		28	22.5
1100								41	23	8	3		33	27
1200								49	27.5	9.5	4		39	32
1300								57	32.5	11	4.5		45	38
1400								66.5	38	13	5		52	44
1500								76.5	43	15	6		60	50
1750									59	20	8			
2000									77	26.5	10.5			
2500										41.5	16.5			

NOTE: These friction loss figures will vary accordingly with age and manufacturer of hose.

PRESSURE DROP (PV) DUE TO CHANGE IN VELOCITY OF WATER FLOWING THROUGH CONDUIT WITH REDUCED AREA

Flow (GPM) = ^	Inlet Dia (in) =>	2.0	2.5	3.0	4.0	4.0	4.5	6.0	6.0	2 x 2.5	3 x 2.5
	Outlet Dia (in) =>	1.5	1.5	2.5	2.5	3.5	2.5	2.5	3.5	2.5	3.5
100	1.5	1.9	0.1	0.2	0.0	0.3	0.3	0.1	0.2	0.0	0.0
200	6.1	7.8	0.6	1.0	0.1	1.0	1.1	0.3	0.9	0.2	0.2
300	13.7	17.5	1.3	2.2	0.3	2.4	2.5	0.6	2.0	0.4	0.4
400	24.4	31.1	2.4	3.9	0.5	4.2	4.5	1.1	3.5	0.7	0.7
500	38.1	48.6	3.7	6.1	0.8	6.5	7.0	1.7	5.4	1.1	1.1
600			5.4	8.8	1.1	9.4	10.1	2.4	7.8	1.6	1.6
700			7.3	12.0	1.5	12.8	13.7	3.3	10.6	2.1	2.1
800			9.6	15.7	2.0	16.8	18.0	4.3	13.9	2.8	2.8
900			12.1	19.9	2.5	21.2	22.7	5.4	17.6	3.5	3.5
1000			15.0	24.5	3.1	26.2	28.1	6.7	21.7	4.3	4.3
1100			18.1	29.7	3.8	31.7	33.9	8.1	26.3	5.2	5.2
1200			21.6	35.3	4.5	37.7	40.4	9.6	31.3	6.2	6.2
1300			25.3	41.4	5.3	44.2	47.4	11.3	36.7	7.3	7.3
1400			29.4	48.0	6.1	51.3	55.0	13.1	42.6	8.5	8.5
1500			33.7	55.2	7.0	58.9	63.1	15.0	48.9	9.7	9.7
1600					8.0		71.8	17.0			
1700					9.0		81.1	19.2			
1800					10.1		90.9	21.6			
1900					11.2		101.3	24.0			
2000					12.5		112.2	26.6			

Bernoulli's Equation = > Total Static Pressure Drop (TSPD) = Pressure Drop due to change in water velocity (Pv) + Friction Loss (F.L.)

When the Total Static Pressure Drop of a system is known (line pressure at inlet less line pressure at outlet), the associated Friction Loss of the system can be calculated by subtracting the appropriate value in the table above from the measured Total Static Pressure Drop.

NOTE: For all systems which have an outlet area smaller than the inlet area, the reported Friction Loss will always be less than the measured total static pressure drop due to the effect of the change in velocity related pressure drop.

$$F.L. = TSPD - P_v$$



HYDRANT DISCHARGE

HYDRANT DISCHARGE FORMULA

To obtain the flow from hydrant outlets use the same formula as given for smooth bore nozzles but use the factor “C” equal to 0.90. Every Fire Department should check the flow from their hydrants. This can be done simply and easily using only a cap with a pressure gauge attached. Merely place the gauge on one outlet, open the hydrant and read the gauge. Remove another cap, open the hydrant and read the gauge again and obtain the gallons per minute using the above method or from the discharge table for hydrant outlets. Obtain the maximum amount of water available from the discharge table for hydrant outlets. Then to obtain the maximum amount of water available from the hydrant in gallons per minute with a residual of 10 lbs. (which is the lowest you should draw down the pressure on the hydrant) use the following formula.

$$A = \frac{Bx \sqrt{P1-10}}{\sqrt{P1-P2}}$$

- Where A = Gallons per minute available at 10 lbs. residual.
- B = Gallons per minute obtained.
- P1 = Static pressure on hydrant with no water flowing.
- P2 = Residual pressure on hydrant with water flowing.

DISCHARGE TABLE FOR HYDRANT OUTLETS

Outlet Pressure (lbs.)	Outlet Diameter (inches)				Outlet Pressure (lbs.)	Outlet Diameter (inches)			
	2.5	3	4	4.5		2.5	3	4	4.5
	U.S. Gallons per Minute					U.S. Gallons per Minute			
1	170	240	430	540	16	670	970	1720	2180
2	240	340	610	770	17	690	1000	1770	2240
3	290	420	740	940	18	710	1030	1820	2310
4	340	480	860	1090	19	730	1050	1870	2370
5	380	540	960	1220	20	750	1080	1920	2430
6	410	590	1050	1340	22	790	1130	2020	2550
7	440	640	1140	1440	24	820	1180	2110	2660
8	480	680	1220	1540	26	860	1230	2190	2770
9	500	730	1290	1640	28	890	1280	2280	2880
10	530	760	1360	1730	30	920	1320	2350	2980
11	560	800	1430	1810	32	950	1370	2430	3080
12	580	840	1490	1890	34	980	1410	2510	3170
13	610	870	1550	1960	36	1010	1450	2580	3260
14	630	900	1610	2040	38	1040	1490	2650	3350
15	650	940	1660	2110	40	1060	1530	2720	3440

DEFINITIONS

Static Pressure – The word “static” means at rest or without motion. Pressure on water may be produced by an elevated water supply, by atmospheric pressure, or by a force pump. If the water is not moving, the pressure exerted is static. In water distribution systems there is always some flow in the pipes because of normal domestic or industrial needs. A true static pressure is, therefore, seldom found in municipal water systems. From a practical viewpoint, however, the pressure normally found in a water system before water flows from a hydrant, is considered to be static pressure. A water flow definition of static pressure could be as follows: “Static pressure is stored potential energy that is available to force water through pipe, fittings, fire hose, and adapters.”

Residual Pressure – The word “residual” means a remainder, or that which is left. As an example, during a fire flow test, the term residual represents the pressure which is left in a distribution system within the vicinity of one or more flowing hydrants. Residual pressure in a water distribution system will vary depending upon the amount of water that may be flowing from one or more hydrants and upon water consumption demands. One point that must be remembered is that residual pressure must be identified at the location where the reading is taken. A water flow definition of residual pressure could be as follows: “Residual pressure is that part of the total available pressure that is not used to overcome friction or gravity while forcing water through pipe, fittings, fire hose, and adapters.”

Flow Pressure – The rate of flow or velocity of the water coming from a discharge opening produces a force which is called flow pressure or velocity pressure. Since a stream of water emerging from a discharge opening is not encased within a tube, it exerts pressure in a forward direction but does not exert a sidewise pressure. The forward velocity or flow pressure can be measured by using a Pitot tube and gauge. If the size of opening is known, the flow pressure can be used to calculate the

quantity of water flowing in gallons per minute (gpm). A water definition of flow pressure can be as follows: “Flow pressure is the forward velocity pressure at a discharge opening while water is flowing.” An example of flow pressure is one in which the forward velocity of a water stream exerts a pressure that can be read on a gauge.

Normal Operating Pressure – Normal operating pressure is that pressure which flowing water exerts against the wall of a conduit; i.e. pipe, fire hose, appliances, valves, fittings, etc. The difference between static and normal operating pressure is the friction loss caused by the water flowing through these conduits. As soon as water starts to flow, static pressure no longer exists. The demands for water sometimes change during fireground operations, so therefore, normal operating pressures will change also. A piezometer gauge is used to determine this type of pressure. A water flow definition of it would be as follows: “Normal operating pressure is that pressure which flowing water exerts against the wall of the conduit through which it flows in a distribution system.”

Friction Loss – If an opening is made in a closed system of piping or fire hose, a difference in pressure will exist between the internal pressure and the atmospheric pressure outside the pipe or hose. This difference in pressure causes the water to flow toward the lesser pressure. Water flowing through pipe or fire hose meets certain resistances or friction which must be overcome by pressure. This loss of pressure is usually called friction loss or loss because of friction. The only pressure available to overcome this resistance is the total pressure. A fire stream definition of friction loss could be as follows: “Friction loss is that part of total pressure that is lost while forcing water through pipe, fittings, fire hose, and appliances.” The differences in pressure on a hose line between a nozzle and a pumper is a good example of friction loss.

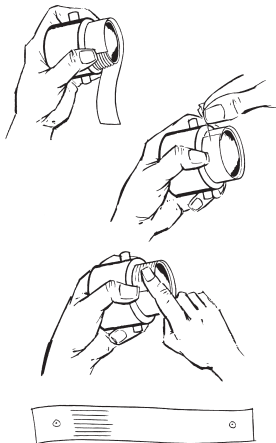
STANDARD FIRE HOSE THREADS

Size	ODM	TPI	Size	ODM	TPI	Size	ODM	TPI	Size	ODM	TPI
Nat'l. Hose Thread (NHT)	Eastern Hose Thread		NY Corp. Thread		Quebec Standard Thread (QST)						
.75	1.3750	8	.75	1.0781	11	1.5	2.093	11	2.5	3.031	7
1	1.3750	8	1	1.4219	11	2	2.547	11	Alberta Mutual Aid Thread (AMA)		
1.25	1.6718	9	1.25	1.6875	11.5	2.5	3.000	8	Chicago FD Thread		
1.5	1.9900	9	1.5	2.1250	11	1	1.375	8	2.5	2.990	8
2	2.5156	8	2	2.6719	7.5	1.5	1.933	11.5	British Columbia (BCT)		
2.5	3.0686	7.5	2.5	3.0000	8	2.5	2.990	7.5	2.5	3.000	8
.3	3.6239	6	Pacific Coast Thread		2.5	2.990	7.5	Western Canada Fire Underwriters Thread			
3.5	4.2439	6	.75	1.0625	11	3.5	4.052	8	Buffalo, NY Thread		
4	5.000	4	1	1.3125	11.5	4	5.000	4	2.5	3.065	8
4.5	5.7609	4	1.25	1.8600	11	4.5	5.7609	4	Cincinnati, OH Thread		
5	6.260	4	1.5	2.1000	11	5	6.260	4	2.5	3.058	6
6	7.025	4	2	2.5500	10	Chicago Hose Thread		Cleveland, OH & Omaha, NE Thread			
Nat'l. Pipe Straight Hose Thread (NPSH)		2.5	3.0350	7.5	.75	1.0810	11.5	Detroit, MI Thread			
		NYFD Thread			1	1.2951	11.5	2.5	3.125	7.5	Pittsburgh, PA Thread
.75	1.0353	14	1	1.660	8	1.25	1.7050	11.5	2.5	3.0625	6
1	1.2951	11.5	1.5	2.100	8	1.5	1.9460	11.5	2.5	3.000	8
1.25	1.6399	11.5	2	2.530	8	2	2.5220	8	Toledo, OH Thread		
1.5	1.8788	11.5	2.5	3.030	8	2.5	3.0430	7	Underwriter Tip Thread		
2	2.3528	11.5	3	3.630	8	Standard Chemical Thread		Underwriter Tip Thread			
2.5	2.843	8	3.5	4.070	8	.75	1.375	8	Underwriter Tip Thread		
3	3.4700	8	4	4.610	8	Canadian Standard Assoc. Thread (CSA)		Underwriter Tip Thread			
3.5	3.9700	8	4.5	5.800	4	1.5	1.8788	11.5	Underwriter Tip Thread		
4	4.4700	8	Underwriter Tip Thread			2.5	3.1250	5	Underwriter Tip Thread		
4.5	4.9700	8	1.5	2.1875	12	Underwriter Tip Thread					

FLANGE SPECIFICATIONS

ANSI Flange Size	2.5"-150#	3.0"-150#	3.0"-300#	4.0"-150#	4.00"-300#	6.0"-150#	6.0"-300#
Diam. of flange	7.00"	7.50"	8.25"	9.00"	10.00"	11.00"	12.50"
Bolt circle diam.	5.50"	6.00"	6.625"	7.50"	7.875"	9.50"	10.625"
Bolt hole diam.	.750"	.750"	.875"	.750"	.875"	.875"	.875"
No. bolt holes	4	4	8	8	8	8	12
Bolt diameter	.625"	.625"	.750"	.625"	.750"	.750"	.750"

METHODS FOR DETERMINING THREAD DIMENSIONS



If Leaf Thread Gauge and Thread Caliper are not available; or sample cannot be sent, the following method may be used to obtain the needed information about threads.

1. Cut a strip of paper about 1" wide and long enough to completely encircle the male thread.
2. Wrap this paper snugly around the male thread making sure it is against the shoulder all the way around.
3. Pierce the paper with a pin at some point where the paper overlaps.
4. Press firmly against the threads with finger. This impression in the paper is used to determine the threads per inch.
5. Remove strip and circle pin holes with pencil.
6. The distance between the pin holes divided by 3.1416 equals the ODM (outside diameter of the male).

Both the ODM and the threads per inch are needed for ordering purposes. Sharp "V" thread form supplied unless otherwise specified.

SUCTION HOSE THREADS

Size	ODM	TPI	Size	ODM	TPI
American LaFrance Thread		Seagrave Thread			
			4.0	5.000	4
4.0	5.085	4	4.5	5.750	4
4.5	5.750	4	5	6.250	4
5	6.150	4	6	7.000	4
6	7.000	4	Hale Fire Pump Thread		
Mack Thread		4.0	5.000	4	
4.0	4.999	4	4.5	5.7609	4
4.5	5.7609	4	5	6.250	4
5	6.230	4	6	7.250	4
6	6.955	4	Ward LaFrance Thread		
Maxim Thread		4.0	5.000	4	
4.0	5.000	4	4.5	5.750	4
4.5	5.750	4	5	6.250	4
5	6.250	4	6	7.000	4
6	7.000	4	Waterous Fire Pump Thread		
Pirsch Thread		4.0	5.0109	4	
4.0	5.000	4	4.0	5.0109	4
4.5	5.750	4	4.5	5.7609	4
5	6.250	4	5	6.260	4
6	7.000	4	6	7.261	4

ABBREVIATION DEFINITIONS

- ODM – outside diameter of male
- TPI – threads per inch

THREAD DESIGNATIONS

- National Hose – NH or NHT; also called National Standard Thread (NST)
 - National Pipe Straight Hose – NPSH; also called Straight Iron Pipe Thread (SIPT)
 - National Pipe Thread – NPT; also called Tapered Iron Pipe Thread (TIPT)
 - British Standard Parallel Pipe – BSPP
 - British Standard Pipe Taper – BSP
- Please inquire with our sales staff as to availability of a specific thread on your product.

TECHNICAL DATA



ADAPTER DATA

TECHNICAL DATA

T-13

Model	Size	Size	Length	Model	Size	Size	Length
318	2.5" F	4.0" M	3	A-327A	1.5" F	1.5" M	1½
	3.0" F	3.5" M	2⅞		2.5" F	1.5" M	1⅞
	3.0" F	4.0" M	3		2.5" F	2.5" M	2⅞
	3.0" F	5.0" M	4	A-327	1.5" F	1.0" M	1⅜
	3.5" F	2.5" M	2⅝		1.5" F	1.5" M	1⅝
	3.5" F	3.0" M	2⅞		1.5" F	2.5" M	1⅞
	3.5" F	3.5" M	2⅞		2.0" F	1.5" M	1⅝
	3.5" F	4.0" M	2⅞		2.0" F	2.0" M	1⅞
	4.0" F	1.5" M	3 ¼		2.0" F	2.5" M	2⅞
	4.0" F	2.5" M	2 ⅞		2.5" F	¾ G.H.	1⅜
	4.0" F	3.0" M	3¾		2.5" F	1.5" M	1⅞
	4.0" F	3.5" F	2⅞		2.5" F	2.0" M	1⅞
	4.0" F	4.0" M	2⅞		2.5" F	2.5" M	2⅞
	4.0" F	4.5" M	2⅞		2.5" F	3.0" M	2⅝
	4.0" F	4.5" M	2⅞		3.0" F	2.0" M	2⅞
	4.0" F	5.0" M	2¾		3.0" F	2.5" M	2⅞
	4.0" F	6.0" M	3		3.0" F	3.0" M	2⅞
	4.5" F	2.5" M	3⅞	F-327A	1.5" F	1.5" F	2⅞
	4.5" F	4.0" M	2⅞		1.5" F	2.5" F	2⅞
	4.5" F	4.5" M	2⅞		1.5" F	2.5" M	2¼
	5.0" F	2.5" M	4⅞		2.5" F	2.5" F	3⅞
	5.0" F	4.0" M	2⅞	3.0" F	2.5" F	3⅞	
	5.0" F	6.0" M	3	F-327	1.5" F	1.5" F	2⅞
	6.0" F	2.5" M	3⅞		2.5" F	2.5" F	3⅞
	6.0" F	3.5" M	4		3.0" F	3.0" F	3⅞
	6.0" F	4.0" M	3⅞	M-327A	1.5" M	1.5" M	2⅞
6.0" F	4.5" M	3⅞	2.5" M		2.5" M	2⅞	
6.0" F	5.0" M	3⅞	M-327ABI	2.5" M	2.5" M	2⅞	
6.0" F	6.0" M	6⅞	M-327	1.5" M	1.5" M	2⅞	
6.0" F	6.0" M	6⅞		2.5" M	2.5" M	2⅞	
S-319	3.0" F	3.0" F	4⅞	S-327	1.5" F	1.5" M	2½
	3.5" F	2.5" F	4⅞		2.0" F	2.0" F	2⅞
	4.0" F	4.0" F	4⅞		2.5" F	1.5" M	2⅞
	4.5" F	2.5" F	4½		2.5" F	2.0" M	2⅞
	4.5" F	3.0" F	5⅞		2.5" F	2.5" M	3
	4.5" F	3.5" F	5⅞		2.5" F	3.0" M	3⅞
	4.5" F	4.0" F	5½		3.0" F	2.5" M	3⅞
	4.5" F	4.5" F	4¾		4.0" F	4.0" M	3⅞
	5.0" F	2.5" F	5⅞	435	2.5" Hose Thd	2.5" NHT	2¼
	5.0" F	3.0" F	5⅞				
	5.0" F	3.5" F	5½				
	5.0" F	4.0" F	5⅞				
	5.0" F	4.5" F	5⅞				
	6.0" F	2.5" F	4½				
6.0" F	4.5" F	4⅞					

LIQUID VOLUME		
To Convert	Into	Multiply by
Ounces (oz)	Milliliters (ml)	29.57
Pints (pt)	Liters (l)	.4732
Quarts (qt)	Liters (l)	.9464
Gallons (gal)	Liters (l)	3.785
Milliliters (ml)	Ounces (oz)	.0338
Liters (l)	Pints (pt)	2.113
Liters (l)	Quarts (qt)	1.057
Liters (l)	Gallons (gal)	.2642

PRESSURE		
To Convert	Into	Multiply by
Pounds per square inch (psi)	Kilopascals (kPa)	6.895
Pounds per square inch (psi)	bar	.06895
Kilopascals (kPa)	Lbs per square inch (psi)	.145
Kilopascals (kPa)	bar	.01
bar	Lbs per square inch (psi)	14.503
bar	Kilopascals (kPa)	100.00

LENGTH		
To Convert	Into	Multiply by
Inches (in)	Millimeters (mm)	25.4
Inches (in)	Centimeters (cm)	2.54
Feet (ft)	Centimeters (cm)	30.48
Feet (ft)	Meters (m)	.3048
Yards (yd)	Meters (m)	.914
Miles (mi)	Kilometers (km)	1.609
Millimeters (mm)	Inches (in)	.039
Centimeters (cm)	Inches (in)	.394
Meters (m)	Feet (ft)	3.282
Kilometers (km)	Miles (mi)	.6214

AREA		
To Convert	Into	Multiply by
Square Inches (in ²)	Square Centimeters (cm ²)	6.452
Square Feet (ft ²)	Square Meters (m ²)	.093
Square Yards (yds ²)	Square Meters (m ²)	.836
Square Miles (mi ²)	Square Kilometers (km ²)	2.59
Square Centimeters (cm ²)	Square Inches (in ²)	.155
Square Meters (m ²)	Square Yards (yds ²)	1.196
Square Kilometers (km ²)	Square Miles (mi ²)	.386

HOSE SIZES			
1" Hose =	25.4 mm	4" Storz =	100.00 mm
1½" Hose =	38.1 mm	4" Hose =	101.60 mm
1¾" Hose =	44.5 mm	4½" Hose =	114.30 mm
2" Hose =	50.8 mm	5" Storz =	125.00 mm
2½" Hose =	63.5 mm	5" Hose =	127.00 mm
3" Hose =	76.2 mm	6" Hose =	152.40 mm
3½" Hose =	88.9 mm		

TIP SIZES			
¼" Tip =	19.1 mm	1 ½" Tip =	38.1 mm
⅜" Tip =	22.2 mm	1 ¾" Tip =	44.5 mm
1" Tip =	25.4 mm	2" Tip =	50.8 mm
1⅛" Tip =	28.6 mm	2 ¼" Tip =	57.2 mm
1¼" Tip =	31.8 mm	2 ½" Tip =	63.5 mm
1⅜" Tip =	34.9 mm	3" Tip =	76.2 mm

SOLID VOLUME		
To Convert	Into	Multiply by
Ounces (oz)	Grams (g)	28.3495
Pounds (lb)	Kilograms (kg)	.4536
Grams (g)	Ounces (oz)	.035
Kilograms (kg)	Pounds (lb)	2.205

PRESSURES GUIDELINES*		
50 psi =	345 kPa =	3.45 bar
60 psi =	414 kPa =	4.14 bar
70 psi =	488 kPa =	4.88 bar
75 psi =	517 kPa =	5.17 bar
80 psi =	552 kPa =	5.52 bar
90 psi =	621 kPa =	6.21 bar
100 psi =	690 kPa =	6.89 bar
150 psi =	1034 kPa =	10.34 bar
200 psi =	1379 kPa =	13.79 bar
250 psi =	1723 kPa =	17.23 bar
300 psi =	2069 kPa =	20.69 bar
350 psi =	2413 kPa =	24.13 bar
580 psi =	3999 kPa =	39.99 bar
700 psi =	4827 kPa =	48.27 bar

FLOW		
FLOW RATE	EXACT LPM	
12 gpm =	45.42 lpm	
13 gpm =	49.20 lpm	
15 gpm =	56.78 lpm	
20 gpm =	75.70 lpm	
23 gpm =	87.06 lpm	
25 gpm =	94.62 lpm	
30 gpm =	113.55 lpm	
40 gpm =	151.40 lpm	
50 gpm =	189.25 lpm	
60 gpm =	227.10 lpm	
70 gpm =	264.95 lpm	
75 gpm =	283.88 lpm	
85 gpm =	321.73 lpm	
95 gpm =	359.58 lpm	
100 gpm =	378.50 lpm	
120 gpm =	454.20 lpm	
125 gpm =	473.13 lpm	
150 gpm =	567.75 lpm	
175 gpm =	662.38 lpm	
200 gpm =	757.00 lpm	
250 gpm =	946.25 lpm	
300 gpm =	1135.50 lpm	
350 gpm =	1324.75 lpm	
375 gpm =	1419.38 lpm	
400 gpm =	1514.00 lpm	
450 gpm =	1703.25 lpm	
500 gpm =	1892.50 lpm	
550 gpm =	2081.75 lpm	
700 gpm =	2649.50 lpm	
750 gpm =	2838.75 lpm	
800 gpm =	3028.00 lpm	
1000 gpm =	3785.00 lpm	
1200 gpm =	4542.00 lpm	
1250 gpm =	4731.25 lpm	
1500 gpm =	5677.50 lpm	
2000 gpm =	7570.00 lpm	

* The above are general guidelines. Elkhart Brass provides more precise figures as applicable.



SPEC DEFINITIONS

HANDLINE NOZZLES

SELECT-O-MATIC® HANDLINE NOZZLES (SM SERIES AND TSM SERIES)

Nozzle shall be constructed of durable, hard anodized, lightweight Elk-O-Lite®; shall have heat-tempered, stainless steel spring mechanism shall have an outside unobstructed waterway, which reacts automatically to water flow and delivers that water flow efficiently throughout the flow range; shall have infinite pattern selection from straight stream to full fog; shall be capable of flushing without shutting down; shall have replaceable spinning teeth; shall have highly visible, protective, urethane bumper; shall have ball with adjustable neoprene seat; shall have rugged aluminum bronze shut-off handle with double stops; and shall have a flow range of 75 to 325 gpm (SM -30F series), 60 to 200 gpm (SM-20F series), 60 to 125 gpm (SM-10F series) or 10 to 75 (SM-3F series); shall comply with NFPA 1964.

CHIEF™ HANDLINE NOZZLES (4000 SERIES – INCLUDING TIPS)

Nozzle shall be constructed of durable, hard anodized, lightweight Elk-O-Lite®; shall be single gallonage and constant flow; shall have infinite pattern selection from straight stream to full fog; shall be capable of flushing without shutting down; shall have replaceable spinning teeth; shall have highly visible, protective urethane bumper shall have hydraulically balanced acetal ball with adjustable neoprene seat; shall have rugged, aluminum bronze shut-off handle with double stops; shall flow _____ gpm at _____psi and have rated flow stamped on stem head; shall comply with NFPA 1964

CHIEF™ HANDLINE NOZZLE TIP (4000-14HR)

Handline nozzle tip shall be constructed of durable, hard anodized, light-weight Elk-O-Lite®; tip shall be single gallonage with a constant flow of 175 gpm operating at 50 psi, with the gallonage shown on the stem head; shall have an infinite pattern selection from straight stream to a full fog with rigid metal fog teeth; nozzle tip shall have no twist shut-off and shall be capable of flushing without shutting down; shall have a luminescent "glow" bumper as standard and 1.5" NHT rigid base.

CHIEF™ HANDLINE NOZZLE (4000-31)

Handline Nozzle shall be constructed of durable, hard anodized, light-weight Elk-O-Lite®. The 1.5" break-apart nozzle (4000-22) shall have a ball shut-off (B-275 GAT) with a pistol grip, a built-in smooth bore tip, and horseshoe-shaped shut-off handle. The nozzle shall have an infinite pattern selection from straight stream to a full fog with the replaceable spinning teeth; and shall be capable of flushing without shutting down the nozzle. The nozzle shall be single gallonage with a constant flow of 250 gpm operating at 100 psi, with the gallonage stamped on the stem head. The unit will have a 1.375" waterway for greater flows, and a 1.5" NHT free swivel base. (Please specify size of smooth bore: 7/8" – 15/16" – 1" – 1 1/8" – 1 1/4").

PHANTOM® HANDLINE NOZZLES (PSFS-HP)

1" Select-O-Flow® nozzle shall be constructed of durable, hard anodized, lightweight Elk-O-Lite®; shall have a constant flow in each of the four detented gallonage positions of 15, 30, 45, and 60 gpm while operating at 100 psi. The nozzle will have a discharge pattern selection from a straight stream to a wide fog pattern and will be capable of flushing without shutting down. The nozzle shall be equipped with an unbreakable, double stop, metal tab handled shut-off with a double actuator driven aluminum ball and double self-adjusting UHMWPE seats. The unit shall have a 1" NHT free swivel base with 1" waterway through the shut-off.

PHANTOM® MID-RANGE NOZZLE (SFM SERIES)

Shall be constructed of durable, hard anodized, lightweight Elk-O-Lite®; shall have internal, ball detent gallonage selector; shall have infinite pattern selection from straight stream to full fog; shall be constant flow; shall be capable of flushing without shutting down; shall have replaceable teeth; shall have heavy-duty urethane protective bumper; shall have rugged aluminum bronze shut-off handle with double stops; shall have adjustable gallonage settings of 30-95-125-150 gpm; shall operate at 75 psi (LP) or 100 psi (HP); shall comply with NFPA 1964.

1.5" FOAM NOZZLE – COAST GUARD APPROVED (SFL-CG AND SFL-GCG)

Nozzle shall be constructed of rugged, corrosion resistant brass and bronze alloys; shall have adjustable stream from straight stream to full wide fog with slotted, locking pattern selector; shall be constant flow; shall be capable of flushing without shutting down; shall have molded urethane protective bumper; shall have hydraulically balanced acetal ball with self-adjusting UHMWPE seat; shall have heavy-duty manganese/bronze shut-off handle with single stop; shall flow 95 gpm at 100 psi; shall have 1.5" NHT free swivel base; shall have durable, cast pistol grip (SFL-GCG only); for SFL-CG, shall have USCG approval number 162.027/14/0, CFR46-162.027/14; for SFL-GCG shall have USCG approval number 162.027/12/0, CFR46-162.02; and shall have cast finish.

ELK-O-LITE® MYSTERY® NOZZLE TIP (L-205-BA)

Handline nozzle tip shall be constructed of durable, hard anodized, lightweight Elk-O-Lite®; shall have fixed tooth design with heavy-duty, protective, urethane bumper; shall be fully adjustable from wide fog to straight stream to shut-off; shall flow _____gpm at _____psi; shall be single gallonage design with rated flow stamped on stem head; shall have two-piece, floating stem; and shall have 1.5" female threaded base.

ELK-O-LITE® MYSTERY® NOZZLE TIP (205-BA AND D-205-BA)

Handline nozzle tip shall be constructed of durable, hard anodized, lightweight Elk-O-Lite®; shall have fixed tooth design with heavy-duty, protective, urethane bumper; shall be fully adjustable from wide fog to straight stream to shut-off; shall flow _____gpm at _____psi; shall be single gallonage design with rated flow stamped on stem head; shall have two-piece, floating stem; and shall have 1.5" female threaded base (205-B) or 2.5" female threaded base (D-205-BA).

BALL SHUT-OFFS

ELK-O-LITE® BALL SHUT-OFF (LB-275A, LB-275-GA, B-275A AND B-275-GA)

Quarter-turn, ball-valved, handline shut-off with 1" waterway (LB-275A or LB-275 GA only) or 1.375" waterway (B-275A or B-275-GA only); shall be constructed of durable, hard anodized, lightweight Elk-O-Lite®; shall have rugged aluminum/bronze horseshoe handle with double stops; shall have hydraulically balanced acetal valve ball with an adjustable neoprene/nylon seat; shall have Elk-O-Lite® pistol grip mounted to bottom of shut-off body (LB-275-GA or B-275-GA only); and shall have a 1.5" female threaded swivel inlet and a 1.5" male threaded outlet.

ELK-O-LITE® BALL SHUT-OFF (DB-275-A)

Quarter-turn, ball-valved, handline shut-off with 1.375" waterway; shall be constructed of durable, hard anodized, lightweight Elk-O-Lite®; shall have rugged aluminum/bronze horseshoe handle with double stops; shall have hydraulically balanced acetal valve ball with an adjustable neoprene/nylon seat; shall have ____" integral smooth bore tip machined into outlet of shut-off body; shall have pistol grip handle mounted to bottom of shut-off body; and shall have a 2.5" threaded swivel inlet and a 1.5" threaded male outlet.

ELK-O-LITE® BALL SHUT-OFF (B-375A)

1.5" double drive ball shut-off with 1.375" waterway; shall be constructed of durable, hard anodized, lightweight, Elk-O-Lite®; shall have a horseshoe-shaped handle with double stops, non-adjustable dual seats with a single cut metal ball. The shut-off shall have a 1.5" NHT female swivel base with a 1.5" NHT male outlet.

ELK-O-LITE® BALL SHUT-OFF (B-375-AT, B-375-GAT, DB-375-A)

Double drive ball shut-off with 1.375" waterway; shall be constructed of durable, hard anodized, lightweight Elk-O-Lite®; shall have a horseshoe-shaped handle with double stops that shall control a dual-drive, single cut, metal ball and an UHMWPE seat; shall have Elk-O-Lite® pistol grip mounted to bottom of shut-off body (B-375-GAT only). The shut-off shall have a 1⁵/₁₆" integral smooth bore tip machined into the outlet of the body. The shut-off shall have a 1.5" NHT female swivel base (B-375-AT or B-375-GAT) or 2.5" NHT swivel base (DB-375-A) with a 1.5" NHT male outlet.

ELK-O-LITE® BALL SHUT-OFF (DB-375-A)

2.5" double drive ball shut-off with a 1.375" waterway; shall be constructed of durable, hard anodized, lightweight Elk-O-Lite®; shall have a horseshoe-shaped handle with double non-adjustable seats, and a single cut, metal ball. The shut-off shall have a 2.5" NHT swivel base with a 1.5" NHT male outlet.

ELK-O-LITE® BALL SHUT-OFF (DB-375-AT AND DB-375-GAT)

2.5" ball shut-off with 1.375" waterway; shall be constructed of durable, hard anodized, lightweight Elk-O-Lite®; shall have a horseshoe-shaped handle with double stops that shall control a dual-drive, single cut, metal ball and an UHMWPE seat; shall have Elk-O-Lite® pistol grip mounted to bottom of shut-off body (DB-375-GAT only). The shut-off shall have a 1.25" integral smooth bore tip machined into the outlet of the body. The shut-off shall have a 2.5" NHT female swivel base with a 1.5" NHT male outlet.

MASTER STREAM NOZZLES

SELECT-O-MATIC® X-STREAM® NOZZLE (SM-1000, SM-1250, SM-1000B, AND SM-1250B)

Nozzle shall be constructed of durable, hard anodized, lightweight Elk-O-Lite® (SM-1000 and SM-1250) or rugged corrosion resistant brass alloys (SM-1000B and SM-1250B); shall have heat-treated, stainless steel spring mechanism, outside unobstructed waterway which reacts automatically to water flow and delivers that flow efficiently throughout the specified flow range; shall have large control handles to easily change pattern; shall be constant flow with infinite pattern selection from straight stream to full fog; shall have highly visible, protective urethane bumper; shall have a flow range of 300 to 1000 gpm (SM-1000 or SM-1000B), 300 to 1250 gpm (SM-1250 or SM-1250B). (Please specify 2.5" or 3.5" swivel base.)

SELECT-O-MATIC® X-STREAM® NOZZLE (SM-2000 AND SM-2000B)

Nozzle shall be constructed of durable, hard anodized, lightweight Elk-O-Lite® (SM-2000) or rugged corrosion resistant brass alloys (SM-2000B); shall have heat-treated, stainless steel spring mechanism, outside unobstructed waterway which reacts automatically to water flow and delivers that flow efficiently throughout the specified flow range; shall have large control handles to easily change pattern; shall be constant flow with infinite pattern selection from straight stream to full fog; shall have highly visible, protective urethane bumper; shall have a flow range of 500 to 2000 gpm at 50 to 80 psi; shall have a 3.5" swivel base.

SELECT-O-MATIC® X-STREAM® NOZZLE (SM-1000E, SM-1000BE, SM-1250E, SM-1250BE, SM-2000E)

Same specification as SM-1000/SM-1000B, SM-1250/SM-1250B or SM-2000 except: shall have encased 12 volt DC electric motor with manual override to change stream pattern.

SELECT-O-MATIC® X-STREAM® NOZZLE (SM-1000H, SM-1000HB, SM-1250H, SM-1000HB, SM-2000H)

Same specifications as SM-1000/SM-1000B, SM-1250/SM-1250B, or SM-2000 except: shall have hydraulic piston with built-in flow control to change stream pattern; and brass versions shall have no twist shut-off capabilities.

SELECT-O-MATIC® X-STREAM® NOZZLE (SM-2000BE)

Same specification as SM-2000B except: shall operate at a lower pressure of 80 psi and shall be encased 12 volt DC electric motor with manual override to change stream pattern.

SELECT-O-MATIC® X-STREAM® NOZZLE (SM-2000HB)

Same specifications as SM-2000B except: shall operate at a lower pressure of 80 psi; shall have hydraulic piston with built-in flow control to change stream pattern; shall have no twist shut-off capabilities.

HYDRO-FOAM MASTER STREAM NOZZLE (HF-350 AND HF-500)

Nozzle shall be constructed of rugged, corrosion resistant brass alloys; shall be single gallonage (350 or 500 gpm) and constant flow; shall have infinite pattern positioning from straight stream to full fog; shall have built-in foam eductor which will proportion at 1/2%, 1%, 3% or 6% rate (HF-350 only for 6%); shall be U.L. listed; shall be able to accept optional 1/3" or 3/6" valve (HF-350 only), shut-off valve, and/or quick-connect coupling; shall have grease fitting for easy lubrication of tip cam; and shall have 2.5" swivel base. (Please specify chrome-plated or cast brass finish).

FOAM MASTER STREAM NOZZLE (CSW-C-HF)

Composite nozzle shall have selectable gallonages of 350/500/750 with a built-in foam eductor that shall be capable of 1% or 3% proportioning capacity, but achieves this rate only when the nozzle is flowed at the specific gpm selections listed; shall be provided with an 8' pick-up hose and shall have a 2.5" NHT female swivel inlet.



SPEC DEFINITIONS

FOAM MASTER STREAM NOZZLE (SM-1000-HF AND SM-2000-HF)

Composite automatic nozzle shall flow from 250 to 1000 gpm (SM-1000-HF) or 500 to 2000 gpm (SM-2000-HF); shall have a selectable automatic foam metering; nozzle can be selected to educt at 1% or 3% proportioning capacity (SM-1000-HF) or 1% proportioning capacity (SM-2000-HF), and will achieve close to this rate across a broad flow range; shall be provided with an 8' pick-up hose; and shall have a 2.5" NHT female swivel inlet (SM-1000-HF) or a 3.5" NHT female swivel inlet (SM-2000-HF).

SELECT-O-FLOW® MASTER STREAM NOZZLE (CSW AND CSW-L)

Nozzle shall be constructed of durable, hard anodized, lightweight Elk-O-Lite®; shall have multiple gallonage settings (CSW, 300-550-750 gpm; CSW-L, 500-750-1000-1250 gpm); shall be constant flow; shall have infinite pattern setting from straight stream to wide fog; shall be capable of shutting off; shall be capable of changing gallonage settings while flowing under normal operating pressure; shall have protective rubber bumper; shall have a 2.5" swivel base.

SELECT-O-FLOW® MASTER STREAM NOZZLE (CSW-LB)

Nozzle shall be constructed of rugged, corrosion-resistant brass alloys; shall have multiple gallonage settings of 500-750-1000-1250 gpm; shall be constant flow; shall have infinite pattern setting from straight stream to wide fog; shall be capable of shutting off completely; shall be capable of changing gallonage settings while flowing under normal operating pressure; shall have protective rubber bumper; shall have a 2.5" swivel base.

SELECT-O-STREAM® MASTER STREAM NOZZLE (CJ, CJN, CJB AND CJN-B)

2.5" nozzle shall be constructed of durable, hard anodized, lightweight Elk-O-Lite® (CJ and CJN) or rugged brass alloys (CJB and CJN-B); shall be single gallonage and constant flow of 500 gpm (1000 gpm for the CJN and CJN-B) while operating at a pressure of 100 psi; shall have an easily adjustable stream pattern (with the large control handles) from straight stream to a wide, full fog pattern; shall have a 2.5" NHT swivel base, with chrome-plated trim (CJ and CJN) or satin brass trim (CJB and CJN-B); and shall have no twist shut-off capabilities.

SELECT-O-STREAM® MASTER STREAM NOZZLE (CJ-RC, CJN-RC, CJB-RC AND CJN-B-RC)

2.5" nozzle shall be constructed of durable, hard anodized, lightweight Elk-O-Lite® (CJ-RC and CJN-RC) or rugged brass alloys (CJB-RC and CJN-B-RC); shall be single gallonage and constant flow of 500 gpm (1000 gpm for the CJN-RC and CJN-B-RC) while operating at a pressure of 100 psi; shall have an easily adjustable stream pattern (using cables for remote operation) from straight stream to a wide, full fog pattern; shall have a 2.5" NHT swivel base, with chrome-plated trim (CJ-RC and CJN-RC) or satin brass trim (CJB-RC and CJN-B-RC); and shall have no twist shut-off capabilities.

RAPID ATTACK NOZZLE (R.A.N.®)

Constant gallonage nozzle shall have a flow rate of 500 gpm while operating at 75 psi nozzle pressure and 400 gpm while operating at 50 psi; durable, lightweight Elk-O-Lite® alloy nozzle with hard anodized finish shall have a built-in stream shaper and adjustable stream patterns from straight stream to a full fog pattern; and shall be used in conjunction with an Elkhart R.A.M.® (Rapid Attack Monitor).

MONITORS

PORTABLE ATTACK MONITOR (R.A.M.®)

Lightweight Elk-O-Lite® Rapid Attack Monitor shall have a 2.5" vaned waterway for flows up to 500 gpm; monitor shall be equipped with a U-shaped handle that shall serve as a carrying handle and control the ball shut-off valve; valve control handle shall have a locking pin with pull to release function designed to hold the valve in the closed position during deployment with a charged hose line; monitor shall have a unique safety system incorporated into its design that harnesses nozzle reaction force to stabilize the monitor, automatically activates when the reaction force becomes substantial (approximately 350 gpm) and is independent of system operation without the ability to be overridden; monitor shall have a double ball joint configuration at the outlet for controlled positioning of the nozzle; unit shall have counterbalance mechanisms capable of maintaining desired nozzle position unless overridden by the safety system; shall have an integral portable base that includes four (4) forged aluminum fold out legs that when deployed provide a wide footprint for stability; rear legs shall have 35° rearward angled spikes for maximum stability; attached retention strap with storage bag shall be provided; shall have a red urethane enamel finish with Elk-O-Lite® hard anodized trim and reflective instruction labels; dimensions for the monitor shall not exceed 16.5" long, 8.5" wide and 8.75" high when in the folded position; total weight shall not exceed 19 pounds; monitor shall have one (1) 2.5" NHT female swivel inlet and one (1) 2.5" NHT male outlet; and a storage bracket designed for horizontal or vertical mounting and that allows for rapid deployment shall be provided.

STINGER® PORTABLE MONITOR (8297 2.0 SERIES)

Monitor shall be constructed of durable, lightweight Elk-O-Lite®; shall have two (2) 2.5" clappered inlets (one [1] 3.5", 4.0" or 4.5" swivel inlet or one [1] 4.0" or 5.0" Storz inlet); shall have a 3.0" waterway; shall have folding legs on a portable base; shall be easily detached from portable base; shall have hand-wheel driven worm gear (fully enclosed) for vertical movement; shall have vertical safety stop at 35° above horizontal; shall have positive twist-lock mechanism for horizontal travel; shall have convenient carrying handle; shall be capable of flowing up to 1000 gpm with (2) 2.5" base (1250 gpm with [1] 3.5", 4.0", 4.5" swivel or 4.0" and 5.0" Storz base); shall have 200 psi liquid-filled gauge; shall have 10' safety chain; shall have red urethane enamel finish; shall not exceed 17" in height; shall not exceed 31 lbs., excluding stream shaper and tips.

STINGER® DECK GUN (8297-98 AND 8297-99)

Monitor shall be constructed of durable, lightweight Elk-O-Lite®; shall have a 3.0" waterway; shall be easily detached from (top mount adapter, 8297-98) (topmount fixture, 8297-99); shall have hand-wheel driven worm gear (fully enclosed) for vertical movement from 80° above to 30° below horizontal; shall have full 360° horizontal movement with positive twist-lock mechanism; shall be capable of flowing up to 1250 gpm; shall have 200 psi liquid-filled gauge; shall have (3" – 150# ANSI flange base, 8297-98) (2-2.5" clappered swivel inlet base, 8297-99); shall have red urethane enamel finish; shall not exceed (19.5", 8297-98) (22.5", 8297-99) in height; shall not exceed 14 lbs., excluding stream shaper, tips and top mount adapter/fixture.

STINGER® RF MONITOR 8297RF

Monitor shall be constructed from lightweight cast aluminum with a fully vaned 3.25" waterway; shall have a flow rating of 1250 gpm and be a dual purpose convertible deck gun/portable monitor system; shall be electrically controlled by wireless RF signal at a distance of up to 1000 feet and shall not require the operator to gain access to the location of the monitor to initiate and change the functions

of the monitor; shall have two (2) heavy duty permanent magnet gear motors that allow for simultaneous vertical and horizontal adjustment of stream direction; one motor shall control the left-right rotation while the other motor shall control the elevation of the nozzle; electronic circuitry shall provide protection for the motors in the event an obstruction is encountered during movement; horizontal motor shall have a dual speed feature to allow for precise positioning of the water stream; vertical monitor positions shall have stop locations at 80° above and 30° below the horizontal plane while in deck gun mode, and 80° above to 30° above the horizontal plane while in portable mode; left-right and up-down motors shall have manual override devices for use in the event of power failure; when engaged, the vertical override control shall automatically disengage the motor in order to eliminate safety hazards; left-right motion between the upper monitor and the base (deck gun and/or portable) shall be accomplished by the use of unique (patent pending) self-aligning spur gears; self-aligning feature shall allow quick, reliable installation of the upper monitor onto the base while minimizing the chance of a butt tooth condition between the drive pinion and the ring gear; deck gun base ring gear shall allow full 360° rotation of the monitor, with an optional 270° ring gear available for top control panel pumper installations in order to prevent inadvertent directing of the deck gun stream toward the pump operator; portable base ring gears shall allow left-right stream rotation of 45° to either side of the straight ahead position; deck gun base options shall include 3" ANSI 150 lb. flange or 3" NPT female pipe thread connection; portable bases shall be available with two 2.5" female hose thread swivel connections, or single female hose thread swivel connections in 3.5", 4", or 4.5" size, or single inlet free swivel Storz hose connection in 4" or 5" size; portable bases shall be supported by four (4) heavy-duty forged aluminum legs with spring-loaded carbide ground spikes; support legs shall fold for compact storage, and a quick-release bracket, with single lever release action, shall be available for safe, secure storage of the portable base assembly; and monitor shall meet all of the applicable NFPA #1901 (2003 edition) standards, both required and annex, for apparatus mounted monitors.

POWER SYSTEM FOR STINGER® RF

Upper monitor assembly shall include a 12 volt, 5 amp/hr sealed lead-acid battery to serve as the power source for portable operation; battery shall be housed in a cast aluminum enclosure, sealed to NEMA 4 requirements; retractable power cable assembly shall be provided for connection to the monitor control box while monitor is installed on the deck gun base on the fire apparatus; cable assembly shall have a circular coaxial type connector for attachment to and quick detachment from the monitor control box; opposite end of the power cable assembly shall include a strain relief fitting to allow the cable to be secured to the apparatus with wire conductors connected un-switched to the vehicle battery system; while connected to the monitor control box, this cable shall allow the monitor to operate under vehicle power in the deck gun mode, as well as provide a power source for charge maintenance of the 5 amp/hr lead-acid battery; power cord design shall allow the monitor control system to sense the presence of the cord connector within the control box receptacle and signal the controller to allow the "deck gun mode" Up-Down travel range; when power cord is unplugged, the controller shall allow Up-Down travel only within the "portable mode" range; LED power status indicator shall be included in the cover of the battery enclosure; indicator shall consist of three (3) high intensity LEDs, one each of red, yellow and green; one (1) LED shall be illuminated at any time, with LED color used to indicate battery charge level: green shall signify a full or high level of charge, while red shall signify a low charge level; a steady burning LED shall signify that the vehicle power cable is connected to the monitor control box, and a flashing LED shall signal that the monitor is operating from battery power.

ELECTRONIC CONTROLS FOR STINGER® RF

The electrical system and components on the monitor shall have a NEMA 4 rating with reverse polarity and circuit board moisture protection; control circuitry shall use programmable integrated circuit technology for monitor up/down, left/right rotation and nozzle control functions; system shall utilize only encoded radio frequency links to assure multiple frequency availability in the event multiple monitors are utilized at the same incident; horizontal motor circuitry shall have programmable limits of any angle combination, which permit the user to set limits directly from the remote transmitter to allow for automatic oscillation of the monitor; monitor shall be supplied with a pump panel (main) control module powered by the chassis 12 volt electrical system and a wireless (secondary) handheld control; both controls shall have NEMA 4 ratings and designed with similar positioning of the controls for operator familiarization consistency; handheld control shall have a 1000 foot range to permit operation of the monitor in a safe area, away from the collapse zone; handheld control shall be powered by two (2) readily available AA batteries with a life cycle of 20 hours of continuous operation; automatic power down feature shall be incorporated to place the handheld remote into "sleep mode" after five minutes of inactivity; On/Off button shall also be provided to manually control the power usage of the remote; low battery LED indicator light shall illuminate two hours prior to depletion of the batteries; panel mounted control shall override function of the handheld device if used simultaneously; wireless devices shall be FCC Part 15 compliant and not require a license; and system electrical components shall be completely shock, vibration, drop and environmentally tested and certified to meet all requirements of the fire service.

SCORPION® DECK GUN (8294-02)

Deck gun shall be constructed of durable, lightweight Elk-O-Lite®; shall have 4.0" vaned waterway; shall be capable of flowing up to 2000 gpm; shall have hand-wheel driven worm gear (fully enclosed) for vertical travel of 90° above to 45° below horizontal with optional stop at 45° above horizontal; shall have hand-wheel driven worm gear (fully enclosed) for 360° horizontal travel; shall have grease fittings for easy lubrication of gears and ball races; shall have 300 psi liquid-filled gauge; shall have 4.0" – 150# ANSI flange base; shall have red urethane enamel finish.

SCORPION® ELECTRIC REMOTE CONTROLLED DECK GUN (8294-04)

Deck gun shall be constructed of durable, lightweight Elk-O-Lite®; shall have 4.0" vaned waterway; shall have fully enclosed motor driven worm gear for vertical travel of 90° above to 45° below horizontal with optional stop at 45° above horizontal; shall have motor driven worm gear for 347° horizontal travel with 37 safety stop positions to comply with NFPA 1901; shall have totally sealed planetary gear type 12V DC electric motors with manual override; shall include 12V DC control package of one (1) relay box with solid state circuitry, one (1) primary control box with function switches and override capability, and one (1) secondary control box with function switches and override capability; shall have grease fittings for easy lubrication of gears and ball races; shall have 300 psi liquid-filled gauge; shall have 4.0" – 150# ANSI flange base; shall have red urethane enamel finish.

OPTIONAL FOR 8294-04:

- Shall have hand-held remote control box with 50' of cable
- Shall have 12V DC battery housed in weatherproof case
- Shall include electrically controlled (with manual override), automatic, combination fog nozzle capable of flowing from 500 to 2000 gpm (SM-2000E)



SPEC DEFINITIONS

SCORPION® RF MONITOR (8294)

Monitor shall be constructed from lightweight cast aluminum with a fully vaned 4" waterway producing a friction loss factor of less than 27 psi; shall have a flow rating of up to 2000 gpm; shall be configured with a 4" 150# ANSI companion flange inlet and a 3-5" NHT male outlet; shall be electrically controlled without the use of a tethered remote at a distance of 1300 feet and shall not require the operator to gain access to the location of the monitor to initiate and change the functions of the monitor; shall have two (2) heavy-duty permanent magnet gear motors that allow for simultaneous vertical and horizontal adjustment, one motor shall control the continuous 349° rotation while the other motor shall control the elevation of the nozzle; electrical connection for the monitor base shall permit unlimited rotation in either direction without dead zones; electronic circuitry shall provide protection for the motor in the event an obstruction is encountered during movement; horizontal motor shall allow for precise positioning of the water stream with user defined stop positions; vertical monitor positions shall have stop locations at 90° above and 45° below the horizontal plane with 10 other user defined stop positions; control circuitry shall have an automatic storage function (return to minimum dimensions) to allow the monitor to return to its stowed position area on top of the apparatus; horizontal and vertical motors shall have a manual override device for use in the event of power failure; electrical controls shall be compatible with 12 volt electrical systems; a wiring connection for a (customer supplied) "monitor nested" light shall be supplied; and monitor shall meet all of the applicable NFPA #1901 (2003 edition) standards, both required and annex, for apparatus mounted monitors.

ELECTRONIC CONTROLS FOR SCORPION® RF

The electrical system and components on the monitor shall have a NEMA 4 rating with reverse polarity and circuit board moisture protection; control circuitry shall use programmable integrated circuit technology for monitor up/down, left/right rotation and nozzle control functions; system shall utilize only encoded radio frequency links to assure multiple frequency availability in the event multiple monitors are utilized at the same incident; horizontal motor circuitry shall have programmable limits of any angle combination, which permit the user to set limits directly from the remote transmitter to allow for automatic oscillation of the monitor without operator intervention; monitor shall be supplied with a pump panel (main) control module powered by the chassis 12 volt electrical system and a wireless (secondary) control panel; both controls shall have NEMA 4 ratings and shall be designed with similar positioning of the controls for operator familiarization consistency; the handheld control shall have a 1300 foot range to permit operation of the monitor in a safe area, away from the collapse zone; handheld control shall be powered by two (2) readily available AA batteries with a life cycle of 20 hours of continuous operation; automatic power down feature shall be incorporated to place the remote into "sleep mode" after five minutes of inactivity; On/Off button shall also be provided to manually control the power usage of the remote; low battery LED indicator light shall illuminate two hours prior to depletion of the batteries; priority panel mounted control shall override the secondary devices if used simultaneously; wireless devices shall be FCC Part 15 compliant and not require a license; and system electrical components shall be completely shock, vibration, drop and environmentally tested and certified to meet all requirements of the fire service.

VULCAN® RF MONITOR

Monitor shall be constructed from lightweight cast aluminum with a fully vaned 3.5" waterway producing a friction loss factor of less than 27 psi; monitor shall have a flow rating of 1250 gpm; monitor shall be configured with a 3" 150# ANSI flange inlet and a 2.5" NHT male outlet; monitor shall be electrically controlled without the use of a tethered remote at a distance of 1000 feet and shall not require the operator to gain access to the location of the monitor to initiate and change the functions of the monitor; when in the stowed position (monitor and nozzle) the monitor shall have maximum dimensions of 16" high, 12" wide and 22" deep; monitor shall have two (2) heavy duty permanent magnet gear motors that allow for simultaneous vertical and horizontal adjustment; one motor shall control the continuous 360° rotation while the other motor shall control the elevation of the nozzle; electrical connection for the monitor base shall permit unlimited rotation in either direction without dead zones; electronic circuitry shall provide protection for the motor in the event an obstruction is encountered during movement; horizontal motor shall have a dual speed feature to allow for precise positioning of the water stream; vertical monitor positions shall have stop locations at 90° above and 45° below the horizontal plane; the control circuitry shall have an automatic storage function (return to minimum dimensions) to allow the monitor to return to its stowed position area on top of the apparatus; the horizontal and vertical motors shall have a manual override device for use in the event of power failure; electrical controls shall be compatible with 12 volt electrical systems; and monitor shall meet all of the applicable NFPA #1901 (2003 edition) standards, both required and annex, for apparatus mounted monitors.

ELECTRONIC CONTROLS FOR VULCAN® RF

The electrical system and components on the monitor shall have a NEMA 4 rating with reverse polarity and circuit board moisture protection; control circuitry shall use programmable integrated circuit technology for monitor up/down, left/right rotation and nozzle control functions; system shall utilize only encoded radio frequency links to assure multiple frequency availability in the event multiple monitors are utilized at the same incident; horizontal motor circuitry shall have programmable limits of any angle combination, which permit the user to set limits directly from the remote transmitter to allow for automatic oscillation of the monitor without operator intervention; monitor shall be supplied with a pump panel (main) control module powered by the chassis 12 volt electrical system and a wireless (secondary) control panel; both controls shall have NEMA 4 ratings and designed with similar positioning of the controls for operator familiarization consistency; handheld control shall have a 1000 foot range to permit operation of the monitor in a safe area, away from the collapse zone; handheld control shall be powered by two (2) readily available AA batteries with a life cycle of 20 hours of continuous operation; automatic power down feature shall be incorporated to place the handheld remote into "sleep mode" after five minutes of inactivity; On/Off button shall also be provided to manually control the power usage of the remote; a low battery LED indicator light shall illuminate two hours prior to depletion of the batteries; panel mounted control shall override the wireless devices if used simultaneously; wireless devices shall be FCC Part 15 compliant and not require a license; system electrical components shall be completely shock, vibration, drop and environmentally tested and certified to meet all requirements of the fire service.

STINGRAY® INDUSTRIAL MONITOR (8393 OR 8393P)

Monitor shall be constructed of rugged, corrosion resistant brass alloys; shall have full 3.0" single waterway; shall have hand-wheel driven worm gear (fully enclosed) for vertical travel of 90° above to 60° below horizontal; shall have full 360° horizontal travel with positive twist-lock mechanism; shall be capable of flowing up to 1250 gpm; shall have grease fittings for easy lubrication of gear and ball races; shall have 200 psi liquid-filled gauge (8393P only); shall be furnished with 3" 150# ANSI flange base (3.0" NPT and 4.0" 150# ANSI flange bases optional); shall be FM approved and CE certified; shall have red urethane enamel finish.

STINGRAY® IV (8393IV [2.0])

Monitor shall be constructed of rugged, corrosion resistant brass alloys; monitor shall have a single waterway with a 3" interior diameter brass tubing; full waterway shall allow for constant flows up to 1250 gpm; monitor shall have a hand-wheel driven worm gear that shall be fully enclosed; stainless steel worm gear shall control the full 360° rotation with 140° of vertical travel with 70° above to 70° below the horizontal plane that shall hold position wherever it is stopped; shall be equipped with a positive twist-lock mechanism when full rotation is used; shall be equipped with an integral 3" quarter-turn, full flow ball valve with an "F" handle (Elkhart model #2893); monitor shall have four ball races with bronze balls and greased zerks for easy lubrication; shall be equipped with 3" 150# ANSI mounting flange and a 2.5" NH male outlet; and shall have a red urethane enamel finish.

COPPERHEAD (8593)

Monitor shall be constructed of rugged, corrosion resistant brass alloys; shall have a 3" waterway with cast-in vane that shall allow for constant flows up to 1250 gpm; shall have a 24" stainless steel rod to control the full 360° rotation; vertical movement shall be 90° above to 45° below the horizontal plane that shall hold position wherever it is stopped; shall be equipped with stainless steel lock hardware for positioning; shall have brass balls in all swivel joints with greased fittings for easy lubrication; shall be equipped with a 3" 150# ANSI mounting flange and a 2.5" NHT male outlet; and shall be painted red urethane enamel. (Optional — pressure gauge, part number 39130000, available. The pressure gauge shall be liquid-filled with calibration readings from 0 to 200 psi.)

PYTHON® INDUSTRIAL MONITOR (299-11)

Monitor of single waterway design shall be constructed of rugged, corrosion resistant brass; shall have waterway of 2.5" I.D. brass tubing; shall have cast swivel brass joints with bronze balls and grease zerks for easy lubrication; shall have full 360° rotation with brass and stainless steel twist-lock mechanism; shall have 150° vertical travel (90° above to 60° below horizontal) controlled with stainless steel handle rod and brass and stainless steel twist-lock mechanism; shall be capable of flowing up to 1250 gpm with minimal friction loss; shall be FM approved; and shall have red urethane enamel finish.

GIANT PYTHON® INDUSTRIAL MONITOR (299-20)

Monitor of single waterway design shall be constructed of rugged, corrosion resistant stainless steel, shall have waterway of 3.5" I.D. stainless steel tubing; shall have cast stainless steel swivel joints with stainless steel balls and grease zerks for easy lubrication; shall have full 360° rotation controlled by hand-wheel driven worm gear; shall have 150° vertical travel controlled by hand-wheel driven worm gear; shall have worms and gears of chrome-plated brass; shall have built in 300lb pressure gauge; shall be capable of flowing up to 2500 gpm with minimal friction loss; shall be FM approved; and shall be red urethane enamel finish.

MONITOR ACCESSORY (EXTENDER FOR VULCAN® SERIES [8598])

Extender is designed to provide better clearance for the monitor to allow for a wider coverage range and address firefighter safety concerns; 18" Extender shall be compatible with the Elkhart Vulcan® Series of monitor's and a range of other compact monitors; shall be designed for use with monitor and nozzle flow ratings of 1250 gpm maximum with 100 psi nozzle pressure with a maximum inlet pressure rating of 200 psi; shall be electrically actuated through a pump panel pushbutton control pad and designed for a static load of up to 2500 pounds in any position; shall allow deployment of the monitor in 10 seconds; installation kit shall have an in-cab warning light that shall alert the driver when unit is not retracted; pressure switch shall be provided to limit movement when internal pressure exceeds 10 psi to avoid injury to personnel and damage to equipment; automatic drain system shall be provided on the vertical piping to drain all water from the monitor and piping upon closing of the water valve; shall have a 3" Victaulic base by a 3" Flange outlet for attachment to apparatus piping; Extender package shall include all items required for installation; wiring harnesses shall be available in lengths from 5 to 40 feet; and system shall be powered from the chassis electrical system and shall be in compliance with applicable 2003 NFPA #1901 standards.

VALVES

FIELD ADJUSTABLE PRESSURE REDUCING VALVE (URFA-20, URFA-20S, AND URFA-25)

2.5" right angle field adjustable pressure reducing valve (URFA-20) or 2.5" in-line field adjustable pressure reducing valve (URFA-20S) or 2.5" right angle field adjustable pressure reducing hose valve (URFA-25) shall have a nested spring design utilizing two custom springs allowing a low torque field adjustment of the pressure reducing functions; shall have a 5" hand-wheel requiring less than 15.5 ft-lbs. of torque to open or close the valve; shall utilize a hydraulic piston and cylinder assembly within the lower bonnet to self-throttle in response to pressure change on the downstream side of the valve; shall self-close to maintain a reduced pressure under no-flow conditions; shall self throttle maintaining reduced pressure conditions when flowing and have a built in check valve; shall have five (5) field adjustable valve settings (A-E) on a color coded indication label; pin in hex security screws shall be installed to secure the hand-wheel and a high impact plastic shield covering the pressure reducing adjustment mechanism; one (1) pin in hex bit shall be supplied with each valve; pressure adjustment mechanism shall be utilized using an aluminum adjustment rod provided with each valve and actuated by rotating in either a clockwise or a counter clockwise direction; pressure gauge taps shall be provided on the inlet and the discharge side of the valve; two (2) capped threaded taps on each side of the upper bonnet shall be provided for the installation of an optional tamper proof supervisory switch; and shall be UL and NY City MEA approved.

OPTIONAL SUPERVISORY SWITCH FOR USE WITH URFA VALVES

UL Approved integral tamper resistant supervisory alarm switch contained within a UL approved enclosure with pin in hex security screws providing enhanced security for installation on either side of the valve by threading it into the upper bonnet

UNIBODY VALVE FOR APPARATUS (EB15, EB20, EB25, EB30, AND EB35)

Valve shall be constructed of an all brass body, stainless steel ball with dual polymer seats; shall be capable of accepting any actuator without breaking the waterway; shall be capable of bi-directional flow and incorporating a self-locking ball; shall be capable of swinging out of the waterway for maintenance; shall not require lubrication of seats or any other internal waterway components; shall be manufactured and assembled in the United States and carry a 10 year manufacturer's warranty.

UNIBODY VALVE FOR APPARATUS (EB40)

Valve shall be constructed of an all brass body with a 4" full flow waterway; shall utilize a bronze flat ball design with a single urethane seat; shall not require lubrication of seats or any other internal waterway components; shall be capable of swinging out of the waterway for maintenance; shall be manufactured and assembled in the United States and carry a 10 year manufacturer's warranty.

NATIONAL STOCK #	MODEL #	PAGE
NOZZLES		
4210-00-200-0346	279-L CP	1-25
4210-00-289-1032	4000-02	1-6
4210-01-212-9408	4000-03	1-6
4210-01-464-6883	4000-13	1-6
4210-01-518-2585	B-278-L	1-25
4210-01-475-9715	CJ-B - 350	6-10
4210-01-200-5801	DSF	1-14
4210-00-465-1904	DSF-N	1-14
4210-01-200-1612	DSM-30F	1-9
4210-01-323-3207	HF-500	6-14
4210-00-004-8316	L-205-B - NST	1-20
4820-01-236-7153	LB-275	1-25
4210-01-320-9513	L-OG	1-18
4210-00-269-8970	NTL-C	6-18
4210-01-484-7004	NTS-C FEM	6-18
4210-01-314-2189	SB-275	1-25
4210-01-199-6832	SF-800	
4210-01-202-2155	SFL-OG	1-14
4210-01-108-2717	SFL-OG MOD.	1-14
4210-01-408-6992	SFL-GN	1-22
4210-00-601-0986	SFL-GN-125	1-22
4210-00-465-1906	SFL-GN-95	1-22
4210-01-042-0408	SFL-GN-95	1-22
4210-01-199-6829	SFL-O	1-14
4210-01-199-6830	SFL-OG	1-14
4210-00-465	SFS-GN	
4210-01-490-1822	SFS-GN 3/4"	1-22
4210-01-199-6828	SFS-O	1-22
4210-01-199-6827	SFS-OG	1-22
4210-01-394-3951	SFS-OG	1-22
4210-01-315-1092	SM-10F	1-9
4210-01-212-8329	SM-10FG	1-9
4210-01-199-6844	SM-30PL	1-9
4210-01-441-9798	ST-190BA	1-29
4210-01-202-2160	STDSF	1-9
4210-01-201-1377	STDSM-30F	1-9
4210-01-199-6834	STSF-800	
4210-01-204-1710	STSF-800-A	1-14
4210-01-199-6833	STSFL	1-9
4210-01-202-2159	STSFL-O	1-9
4210-01-200-3247	STSM-10F	1-9
4210-01-230-1447	STSM-30BPA	
4210-01-200-3248	STSM-30F	1-9
4210-01-202-2164	TSF	1-14
4210-01-199-6838	TSF	1-14
4210-01-199-6837	TSFL	
4210-01-202-2163	TSFL-O	
4210-01-199-6845	TSM-10F	1-9
4210-01-199-6835	TSM-30F	1-9
MONITORS		
4210-00-289-1031	8287	5-38
4210-01-327-7775	8294-021	5-51
4210-01-287-1070	8297-98 (w/282A & SM-1000)	5-22

FOAM EDUCTORS		
4210-01-197-9106	240-95	3-3
4210-01-198-3903	241-125	3-3
4210-00-466-5430	241-60	3-3
4210-01-197-9108	241-60	3-3
4210-01-197-9109	241-95	3-3
4210-01-197-9110	241-95	3-3
4320-01-530-5448	241-N3	3-3
4210-01-112-3081	241-N6	3-3
WYES AND WATER THIEFS		
4730-00-322-9636	1	4-11
4210-01-198-7817	1	4-11
4210-01-198-7818	1	4-11
4210-01-263-0920	1	4-11
4210-00-096-9468	B-100	4-11
4210-00-288-7861	B-100	4-11
4210-00-959-3233	B-100	4-11
4210-01-125-9822	B-100	4-11
4210-00-255-0235	B-97	4-11
4810-01-261-7936	B-97-A	4-11
4210-01-196-4579	B-95-A	4-11
4210-01-196-4580	B-95-A	4-11
4210-01-196-4581	B-95-A	4-11
4210-01-196-4564	B-97	4-11
4210-01-196-4576	B-97-A	4-11
4210-01-196-4577	B-97-A	4-11
4210-01-196-4578	B-97-A	4-11
4210-01-198-9813	B-97-A	4-11
4210-01-198-9814	B-97-A	4-11
4210-01-198-9815	B-97-A	4-11
4210-01-198-8347	1A	4-11
4210-01-198-8348	1A	4-11
4210-01-198-8349	1A	4-11
4210-01-198-6049	B-100	4-11
4210-01-233-2405	B-100-A	4-11
4210-01-198-6048	B-100-L	4-11
4210-00-255-0234	B-100N	4-11
4210-01-196-6267	BG-104	4-2
4210-01-196-4582	BG-104-A	4-2
4210-01-038-6001	BG-104N	4-2
4210-01-038-6001	BG-104N	4-2
SIAMESE		
4210-01-196-0085	2	4-6
4210-01-196-4557	2	4-6
4210-01-196-4559	4	4-6
4210-01-196-4560	4	4-6
4210-00-274-8614	4	4-6
4210-01-196-4571	4A	4-6
4210-01-196-4572	4A	4-6
4210-01-196-4564	B-98	4-8
4210-01-196-4565	B-98	4-8
4210-01-196-4566	B-98	4-8
4210-01-196-4576	B-98A	4-8
4210-01-196-4577	B-98A	4-8
4210-01-196-4578	B-98A	4-8
4210-01-196-4579	B-99A	4-8
4210-01-196-4580	B-99A	4-8
4210-01-196-4581	B-99A	4-8

TECHNICAL DATA



NATIONAL STOCK NUMBER LISTING

TECHNICAL DATA

G-9

NATIONAL STOCK #	MODEL #	PAGE
APPARATUS VALVES		
4820-01-371-8330	9786	4-14
4820-01-270-6422	2891-01-01-D	7-19
4820-00-764-7866	2892-01-01-F	7-19
4820-01-267-8604	2896-01-01-D	7-19
4820-01-270-6421	2896-01-35-D	7-19
4820-01-270-9565	2896-01-35-F	7-19
4820-01-266-8145	2896-13-01-F	7-19
4820-01-131-3231	2896-10-01-F	7-19
4820-01-266-7851	890-01-01-D	7-19
4820-00-166-9587	890-01-01-D-3	7-19
4820-00-166-9598	890-01-01-D-4	7-19
4810-01-443-1189	890-43-01-D	7-19
4820-00-166-9837	891-01-01-D-12	7-19
4820-00-166-9836	891-01-01-D-7	7-19
4820-01-213-4318	891-01-01-E-8	7-19
4820-01-300-2752	891-01-03-D	7-19
4210-01-205-3991	891-10-40-E	7-19
4820-01-329-1222	891-40-01-D	7-19
4820-01-329-1223	891-43-01-D	7-19
4820-01-246-1077	891-50-50-D	7-19
4820-00-990-9008	891-01-01-D	7-19
4820-00-432-9588	892-01-01-D	7-19
4820-01-286-1971	892-11-01-D-13	7-19
4820-01-198-2754	892-50-50-D	7-19
4820-01-465-5095	893-50-50-D	7-19
4820-00-096-9326	896-01-01-D	7-19
4820-01-247-0791	896-01-01-D	7-19
4820-01-225-8671	896-01-01-D-7	7-19
4820-01-323-1184	896-01-01-E	7-19
4810-01-247-0792	896-01-37-D	7-19
4820-01-318-9191	896-20-33-F	7-19
4820-01-206-3522	896-50-37-F	7-19
4820-01-329-4965	896-51-21-D	7-19
4820-01-465-5285	896-95-95-D	7-19
4820-01-216-2871	X-86-A	7-5
REPAIR KITS		
4820-01-089-2031		14-2
4820-01-033-5103		14-2
4820-01-130-3384		14-2
4820-01-130-4390		14-2
ADAPTERS		
4210-00-277-3377	306	10-8
4210-00-277-3378	306	10-8
4210-00-288-8811	306	10-8
4730-00-277-6845	306	10-8
4210-00-174-6863	307	10-4
4210-00-827-8765	307	10-4
4210-00-864-4168	307	10-4
4210-00-952-6036	307	10-4
4730-01-286-3201	307	10-4
4730-01-245-0258	419	10-8
4730-01-247-0796	419	10-8
4210-01-208-4851	435	10-3
4730-00-618-8592	318 SPL	10-4
4210-01-268-0206	418	10-6
4730-01-247-0761	418	10-6

4210-01-247-0763	418-S	10-6
4210-00-143-4353	A-327	10-4
4210-00-202-7466	A-327	10-4
4210-00-209-5023	A-327	10-4
4210-01-131-8245	A-327	10-4
4730-00-090-9228	A-327	10-4
4210-00-288-8816	F-327	10-4
4210-00-307-4699	F-327	10-4
4210-00-377-6521	F-327	10-4
4210-01-160-8043	F-327	10-4
4210-00-488-8402	F-327-A	10-4
4210-00-262-9211	M-327	10-4
4210-00-277-3374	M-327	10-4
4210-00-277-3375	M-327	10-4
4210-00-288-8827	M-327	10-4
4210-00-289-1305	M-327	10-4
4210-00-288-8815	S-319	10-4
4210-01-160-5634	S-319	10-4
4210-01-037-6265	S-327	10-4
4730-00-541-6551	S-327	10-4
CAPS & PLUGS		
4730-00-240-5540	310	10-1
4820-01-247-0762	310	10-1
5342-01-245-0264	311	10-1
4210-01-247-0762	310 6"	10-1
2930-00-318-0939	310 2" NPSH	10-1
2590-01-465-5807	310 3"	10-1
4210-00-355-4862	419 SPL & 311	10-8
5342-01-322-1475	310	10-1
VALVES		
4820-01-518-2434	UR-20 ZZA	9-4
ACCESSORIES		
4210-00-288-7864	105	10-4
4820-00-281-2679	110	7-26
4820-01-363-7342	115	7-26
4210-00-409-6565	181	1-29
4210-00-240-5530	315	8-2
4210-01-363-2171	105-2.5	10-4
4210-01-327-7776	283-A	1-27
4820-00-540-2381	315-FN	8-2
4820-01-465-4777	40-41	7-27
4210-01-130-8595	S-320 1.5"	8-2
4210-01-127-6167	S-320 2.5"	8-2
4210-01-213-4454	S-320 4.5"	8-1
5120-00-018-1519	S-454	2-2
4210-01-327-7777	ST-191-A	1-29
5120-01-382-8041	T-464	2-2