



ENGINEERING DATA

FPP

Minimum Pressure Requirement Primary Only

UNIT SIZE	INLET SIZE	PRIMARY CFM	MIN Ps
2	06	100	0.01
		200	0.05
		300	0.12
		400	0.21
		500	0.32
	08	160	0.01
		320	0.04
		480	0.09
		640	0.17
		800	0.26

UNIT SIZE	INLET SIZE	PRIMARY CFM	MIN Ps
3	08	180	0.01
		360	0.05
		540	0.12
		700	0.20
		900	0.33
	10	275	0.01
		550	0.05
		825	0.11
		1100	0.20
		1375	0.32

UNIT SIZE	INLET SIZE	PRIMARY CFM	MIN Ps
4	10	290	0.01
		580	0.06
		870	0.13
		1100	0.20
		1430	0.34
	12	400	0.01
		800	0.05
		1200	0.12
		1600	0.21
		2000	0.32

UNIT SIZE	INLET SIZE	PRIMARY CFM	MIN Ps
5	12	420	0.01
		840	0.06
		1260	0.13
		1600	0.21
		2060	0.34
	14	600	0.02
		1150	0.06
		1710	0.13
		2100	0.19
		2800	0.34

UNIT SIZE	INLET SIZE	PRIMARY CFM	MIN Ps
6	14	570	0.01
		1140	0.06
		1710	0.13
		2100	0.19
		2800	0.34
	16	800	0.02
		1500	0.06
		2200	0.12
		2900	0.22
		3600	0.33

UNIT SIZE	INLET SIZE	PRIMARY CFM	MIN Ps
7	16	740	0.01
		1480	0.06
		2220	0.13
		2800	0.20
		3660	0.34

ENGINEERING DATA

FPP Sound Data

Minimum Inlet Static Pressure

Case	Inlet Size	Pressure Drop	Primary CFM	Discharge, Primary Octave Bands						NC Levels Discharge	Radiated, Primary Octave Bands						NC Levels Radiated
				2	3	4	5	6	7		2	3	4	5	6	7	
2	6	0.01	100	56	47	44	40	36	31	-	42	31	31	25	17	-	-
		0.05	200	67	58	53	49	44	38	23	52	41	40	32	24	15	-
		0.12	300	74	64	59	55	48	41	32	58	47	45	36	28	19	20
		0.21	400	78	69	62	58	52	44	37	62	51	48	40	31	22	25
	8	0.32	500	82	72	65	61	54	46	42	66	54	51	42	34	24	30
		0.01	160	52	50	48	43	36	31	-	46	38	37	30	24	16	-
		0.04	320	63	60	55	50	43	37	19	54	46	44	36	30	22	18
		0.09	480	69	66	59	55	48	41	26	58	50	47	40	33	26	21
3	8	0.17	640	74	70	62	58	51	44	32	62	53	50	42	35	28	25
		0.26	800	77	73	64	61	53	46	36	64	56	52	44	37	30	27
	10	0.01	180	54	52	49	44	37	32	-	47	40	38	31	25	17	-
		0.05	360	65	62	56	52	45	38	21	55	47	45	37	31	23	19
		0.12	540	71	67	60	56	49	42	28	60	51	48	41	34	27	22
		0.20	700	75	71	62	59	52	45	33	63	54	51	43	36	29	26
	12	0.33	900	79	75	65	62	55	47	39	66	57	53	45	38	31	30
		0.01	275	58	55	53	50	42	33	-	47	40	37	30	24	15	-
4	10	0.05	550	67	62	58	55	48	41	23	56	48	45	37	31	23	19
		0.11	825	72	66	62	58	52	45	30	62	53	49	41	36	29	25
		0.20	1100	75	69	64	60	55	48	33	66	57	52	44	39	32	30
		0.32	1375	78	72	66	62	57	51	37	69	60	55	46	41	35	34
	12	0.01	290	59	55	53	51	42	34	-	47	40	38	31	24	15	-
		0.06	580	67	62	59	56	49	41	23	57	49	45	38	32	24	19
		0.13	870	72	67	62	59	53	46	30	63	54	50	42	36	29	26
		0.20	1100	75	69	64	60	55	48	33	66	57	52	44	39	32	30
5	12	0.34	1430	79	72	66	62	57	51	39	69	60	55	47	42	35	34
		0.01	400	59	54	54	49	43	37	-	48	43	41	35	30	23	-
		0.05	800	68	61	60	55	50	44	24	57	50	48	42	36	29	22
		0.12	1200	72	66	63	58	54	49	30	62	55	52	46	40	32	26
	14	0.21	1600	76	69	65	60	57	52	35	66	58	55	48	43	35	30
		0.32	2000	78	71	67	62	59	54	37	69	60	57	51	45	37	34
		0.01	420	60	54	54	49	43	38	-	49	43	41	35	30	24	-
		0.03	840	68	62	60	55	50	45	24	58	51	48	42	37	29	22
6	14	0.07	1260	73	66	63	58	55	49	31	63	55	52	46	40	33	26
		0.13	1600	76	69	65	60	57	52	35	66	58	55	48	43	35	30
		0.34	2060	79	71	68	62	60	54	39	69	61	57	51	45	37	34
		0.02	600	62	57	54	50	46	40	17	51	46	43	37	33	23	17
	16	0.06	1150	69	63	60	56	52	47	26	58	51	48	41	37	29	22
		0.13	1700	73	67	64	59	56	51	31	62	54	50	44	40	33	25
		0.22	2250	75	69	67	62	59	54	33	65	56	52	46	42	35	29
		0.34	2800	78	71	69	64	61	56	37	68	58	54	47	44	37	32
7	14	0.01	570	62	57	53	49	45	39	17	50	46	43	37	33	23	17
		0.06	1140	69	63	60	56	52	47	26	58	51	48	41	37	29	22
		0.13	1710	73	67	64	59	56	51	31	62	54	50	44	40	33	25
		0.19	2100	75	69	66	61	58	53	33	65	56	52	45	42	34	29
	16	0.34	2800	78	71	69	64	61	56	37	68	58	54	47	44	37	32
		0.02	800	65	60	58	53	50	45	21	60	57	53	45	41	37	27
		0.06	1500	70	66	63	58	56	51	27	67	62	58	50	46	42	33
		0.12	2200	74	69	67	62	59	54	32	71	65	61	53	49	45	36
7	16	0.22	2900	76	71	69	64	62	57	35	74	68	63	55	51	47	40
		0.33	3600	78	73	71	66	64	59	37	77	69	64	57	52	49	44
		0.01	740	64	60	57	52	49	44	19	59	56	52	44	40	37	26
		0.06	1480	70	66	63	58	55	51	27	67	62	58	50	45	42	33
7	16	0.13	2220	74	69	67	62	59	54	32	71	65	61	53	49	45	36
		0.20	2800	76	71	69	64	61	57	35	74	67	62	55	50	47	40
		0.34	3660	78	73	71	66	64	59	37	77	70	64	57	53	49	44



ENGINEERING DATA

FPS Sound Data

0.5" Inlet Static Pressure

Case	Inlet Size	Pressure Drop	Primary CFM	Discharge, Primary Octave Bands						NC Levels Discharge	Radiated, Primary Octave Bands						NC Levels Radiated
				2	3	4	5	6	7		2	3	4	5	6	7	
2	6	0.01	100	56	47	44	40	36	31	-	42	31	31	25	17	-	-
		0.05	200	67	58	53	49	44	38	23	52	41	40	32	24	15	-
		0.12	300	74	64	59	55	48	41	32	58	47	45	36	28	19	20
		0.21	400	78	69	62	58	52	44	37	62	51	48	40	31	22	25
		0.32	500	82	72	65	61	54	46	42	66	54	51	42	34	24	30
	8	0.01	160	52	50	48	43	36	31	-	46	38	37	30	24	16	-
		0.04	320	63	60	55	50	43	37	19	54	46	44	36	30	22	18
		0.09	480	69	66	59	55	48	41	26	58	50	47	40	33	26	21
		0.17	640	74	70	62	58	51	44	32	62	53	50	42	35	28	25
	0.26	800	77	73	64	61	53	46	36	64	56	52	44	37	30	27	
3	8	0.01	180	54	52	49	44	37	32	-	47	40	38	31	25	17	-
		0.05	360	65	62	56	52	45	38	21	55	47	45	37	31	23	19
		0.12	540	71	67	60	56	49	42	28	60	51	48	41	34	27	22
		0.20	700	75	71	62	59	52	45	33	63	54	51	43	36	29	26
		0.33	900	79	75	65	62	55	47	39	66	57	53	45	38	31	30
	10	0.01	275	58	55	53	50	42	33	-	47	40	37	30	24	15	-
		0.05	550	67	62	58	55	48	41	23	56	48	45	37	31	23	19
		0.11	825	72	66	62	58	52	45	30	62	53	49	41	36	29	25
		0.20	1100	75	69	64	60	55	48	33	66	57	52	44	39	32	30
	0.32	1375	78	72	66	62	57	51	37	69	60	55	46	41	35	34	
4	10	0.01	290	59	55	53	51	42	34	-	47	40	38	31	24	15	-
		0.06	580	67	62	59	56	49	41	23	57	49	45	38	32	24	19
		0.13	870	72	67	62	59	53	46	30	63	54	50	42	36	29	26
		0.20	1100	75	69	64	60	55	48	33	66	57	52	44	39	32	30
		0.34	1430	79	72	66	62	57	51	39	69	60	55	47	42	35	34
	12	0.01	400	59	54	54	49	43	37	-	48	43	41	35	30	23	-
		0.05	800	68	61	60	55	50	44	24	57	50	48	42	36	29	22
		0.12	1200	72	66	63	58	54	49	30	62	55	52	46	40	32	26
		0.21	1600	76	69	65	60	57	52	35	66	58	55	48	43	35	30
	0.32	2000	78	71	67	62	59	54	37	69	60	57	51	45	37	34	
5	12	0.01	420	60	54	54	49	43	38	-	49	43	41	35	30	24	-
		0.03	840	68	62	60	55	50	45	24	58	51	48	42	37	29	22
		0.07	1260	73	66	63	58	55	49	31	63	55	52	46	40	33	26
		0.13	1600	76	69	65	60	57	52	35	66	58	55	48	43	35	30
		0.34	2060	79	71	68	62	60	54	39	69	61	57	51	45	37	34
	14	0.02	600	62	57	54	50	46	40	17	51	46	43	37	33	23	17
		0.06	1150	69	63	60	56	52	47	26	58	51	48	41	37	29	22
		0.13	1700	73	67	64	59	56	51	31	62	54	50	44	40	33	25
		0.22	2250	75	69	67	62	59	54	33	65	56	52	46	42	35	29
	0.34	2800	78	71	69	64	61	56	37	68	58	54	47	44	37	32	
6	14	0.01	570	62	57	53	49	45	39	17	50	46	43	37	33	23	17
		0.06	1140	69	63	60	56	52	47	26	58	51	48	41	37	29	22
		0.13	1710	73	67	64	59	56	51	31	62	54	50	44	40	33	25
		0.19	2100	75	69	66	61	58	53	33	65	56	52	45	42	34	29
		0.34	2800	78	71	69	64	61	56	37	68	58	54	47	44	37	32
	16	0.02	800	65	60	58	53	50	45	21	60	57	53	45	41	37	27
		0.06	1500	70	66	63	58	56	51	27	67	62	58	50	46	42	33
		0.12	2200	74	69	67	62	59	54	32	71	65	61	53	49	45	36
		0.22	2900	76	71	69	64	62	57	35	74	68	63	55	51	47	40
	0.33	3600	78	73	71	66	64	59	37	77	69	64	57	52	49	44	
7	16	0.01	740	64	60	57	52	49	44	19	59	56	52	44	40	37	26
		0.06	1480	70	66	63	58	55	51	27	67	62	58	50	45	42	33
		0.13	2220	74	69	67	62	59	54	32	71	65	61	53	49	45	36
		0.20	2800	76	71	69	64	61	57	35	74	67	62	55	50	47	40
		0.34	3660	78	73	71	66	64	59	37	77	70	64	57	53	49	44

Terminal
Units

ENGINEERING DATA

FPP Sound Data

1.0" Inlet Static Pressure

Case	Inlet Size	Pressure Drop	Primary CFM	Discharge, Primary Octave Bands						NC Levels Discharge	Radiated, Primary Octave Bands						NC Levels Radiated
				2	3	4	5	6	7		2	3	4	5	6	7	
2	6	0.01	100	58	51	47	43	41	36	-	43	35	34	28	22	13	-
		0.05	200	69	62	56	52	48	43	26	54	45	42	35	29	20	15
		0.12	300	76	68	61	58	53	47	35	60	51	47	40	33	25	22
		0.21	400	80	73	65	62	56	49	40	64	55	51	43	36	28	27
		0.32	500	84	76	68	64	59	52	45	68	58	54	45	38	30	32
	8	0.01	160	56	54	52	47	41	37	-	49	43	42	35	29	23	15
		0.04	320	66	64	59	55	49	44	24	57	50	48	41	35	29	22
		0.09	480	73	70	63	60	53	48	31	62	54	52	44	39	32	26
		0.17	640	77	74	66	63	57	50	36	65	57	55	47	41	35	30
		0.26	800	81	77	68	65	59	53	41	68	60	57	49	43	37	32
3	8	0.01	180	57	56	54	49	43	39	-	51	44	43	36	30	24	17
		0.05	360	68	66	60	56	50	45	26	59	51	49	42	36	30	23
		0.12	540	75	72	64	61	55	49	33	63	56	53	45	40	34	27
		0.20	700	79	75	67	64	58	51	39	66	58	55	48	42	36	30
		0.33	900	83	79	70	67	60	54	44	69	61	58	50	44	38	34
	10	0.01	275	62	60	58	56	48	40	19	52	46	43	36	30	21	17
		0.05	550	71	67	64	61	54	47	28	61	54	51	43	37	30	25
		0.11	825	76	72	67	64	58	52	35	67	60	55	47	42	35	31
		0.20	1100	79	75	69	66	61	55	39	71	63	59	50	45	38	36
		0.32	1375	82	77	71	68	63	57	42	74	66	61	53	48	41	40
4	10	0.01	290	63	61	58	56	49	40	20	52	47	44	37	30	22	18
		0.06	580	72	68	64	61	55	48	30	62	55	52	44	38	30	26
		0.13	870	77	72	67	64	59	52	36	68	60	56	48	43	35	32
		0.20	1100	79	75	69	66	61	55	39	71	63	59	50	45	38	36
		0.34	1430	83	77	71	68	63	58	44	75	66	61	53	48	42	41
	12	0.01	400	63	59	60	56	49	44	18	53	47	45	38	33	28	19
		0.05	800	72	66	65	61	56	51	30	61	55	52	45	40	34	26
		0.12	1200	76	71	69	64	60	55	35	66	59	56	49	44	37	31
		0.21	1600	80	74	71	67	63	58	40	70	62	59	52	46	39	35
		0.32	2000	82	76	73	68	66	61	42	73	65	61	54	48	41	39
5	12	0.01	420	64	60	60	56	50	45	19	53	48	45	38	34	28	19
		0.03	840	72	67	66	62	57	52	30	62	55	52	45	40	34	26
		0.07	1260	77	71	69	65	61	56	36	67	60	56	49	44	38	31
		0.13	1600	80	74	71	67	63	58	40	70	62	59	52	46	39	35
		0.34	2060	83	76	73	69	66	61	44	73	65	61	54	49	42	39
	14	0.02	600	68	64	61	57	52	47	24	55	52	49	43	38	29	23
		0.06	1150	74	70	67	63	59	54	32	63	57	53	47	43	35	27
		0.13	1700	78	73	71	66	63	58	37	67	60	56	49	45	38	31
		0.22	2250	81	76	74	69	66	61	41	70	62	58	51	47	41	35
		0.34	2800	83	78	76	71	68	63	44	72	64	59	53	49	43	38
6	14	0.01	570	67	63	60	56	52	46	23	55	51	48	42	38	29	22
		0.06	1140	74	70	67	63	59	54	32	63	57	53	47	43	35	27
		0.13	1710	78	73	71	66	63	58	37	67	60	56	49	45	38	31
		0.19	2100	80	75	73	68	65	60	40	69	62	57	51	47	40	34
		0.34	2800	83	78	76	71	68	63	44	72	64	59	53	49	43	38
	16	0.02	800	70	67	64	60	56	51	27	63	62	59	52	48	44	34
		0.06	1500	75	72	70	66	62	57	33	70	68	64	57	53	49	39
		0.12	2200	79	75	73	69	66	61	39	75	71	67	60	56	52	43
		0.22	2900	81	78	76	72	68	64	41	78	73	69	62	58	54	45
		0.33	3600	83	79	78	74	70	66	44	80	75	70	64	59	55	48
7	16	0.01	740	69	66	64	59	56	51	26	63	62	58	51	47	43	33
		0.06	1480	75	72	70	66	62	57	33	70	68	64	56	52	49	39
		0.13	2220	79	75	73	69	66	61	39	75	71	67	60	56	52	43
		0.20	2800	81	77	75	71	68	63	41	77	73	69	62	57	54	45
		0.34	3660	83	80	78	74	71	66	44	80	75	71	64	60	56	48



ENGINEERING DATA

FPP Sound Data

1.5" Inlet Static Pressure

Case	Inlet Size	Pressure Drop	Primary CFM	Discharge, Primary Octave Bands						NC Levels Discharge	Radiated, Primary Octave Bands						NC Levels Radiated
				2	3	4	5	6	7		2	3	4	5	6	7	
2	6	0.01	100	59	54	48	45	43	40	-	45	37	35	30	24	16	-
		0.05	200	70	64	57	54	51	46	27	55	47	44	37	32	23	18
		0.12	300	77	71	63	60	56	50	36	61	53	49	42	36	28	23
		0.21	400	81	75	67	63	59	53	41	65	57	53	45	39	31	29
	8	0.32	500	85	78	69	66	62	55	46	69	60	55	47	41	33	34
		0.01	160	58	57	55	50	45	41	15	51	45	45	38	33	27	19
		0.04	320	69	67	62	58	52	48	27	59	52	51	44	39	33	25
		0.09	480	75	72	66	62	57	52	33	64	57	55	47	42	36	30
3	8	0.17	640	79	76	69	66	60	54	39	67	60	57	50	44	39	32
		0.26	800	83	80	71	68	62	57	44	70	62	59	52	46	41	35
	10	0.01	180	60	58	56	51	46	43	17	53	46	46	39	34	28	20
		0.05	360	70	68	63	59	53	49	28	61	54	52	45	39	34	26
		0.12	540	77	74	67	64	58	53	36	66	58	56	48	43	37	31
		0.20	700	81	78	70	67	61	55	41	69	61	58	50	45	40	34
	12	0.33	900	85	81	72	69	64	58	46	71	63	61	53	47	42	36
		0.01	275	65	63	61	59	52	44	23	55	50	47	40	33	25	21
4	10	0.05	550	73	71	67	64	58	51	32	64	58	55	47	41	33	30
		0.11	825	78	75	70	67	62	55	37	70	63	59	51	45	38	35
		0.20	1100	82	78	72	69	64	58	42	74	67	62	54	49	42	40
		0.32	1375	85	80	74	71	67	61	46	77	70	65	56	51	45	44
	12	0.01	290	65	64	61	60	52	44	24	56	50	48	41	34	25	22
		0.06	580	74	71	67	65	59	52	32	65	59	55	48	42	34	30
		0.13	870	79	75	70	68	62	56	39	71	64	60	52	46	39	36
		0.20	1100	82	78	72	69	64	58	42	74	67	62	54	49	42	40
5	12	0.34	1430	85	81	74	71	67	61	46	78	70	65	57	51	45	45
		0.01	400	66	62	63	60	53	48	22	55	50	47	40	35	31	21
		0.05	800	74	69	69	65	60	55	32	64	57	54	47	42	36	29
		0.12	1200	79	74	72	68	64	59	39	69	62	58	51	46	40	34
	14	0.21	1600	82	77	75	71	67	62	42	73	65	61	53	48	42	39
		0.32	2000	85	79	77	72	69	65	46	75	67	63	56	50	44	41
		0.01	420	66	63	63	60	53	49	23	56	50	48	40	36	31	22
		0.03	840	75	70	69	66	60	56	33	64	58	55	47	42	37	30
6	14	0.07	1260	79	74	73	69	65	60	39	70	62	59	51	46	40	35
		0.13	1600	82	77	75	71	67	62	42	73	65	61	53	48	42	39
		0.34	2060	85	79	77	73	70	65	46	76	68	64	56	51	44	43
		0.02	600	71	67	65	61	56	51	28	58	55	52	46	41	32	26
	16	0.06	1150	78	73	71	67	63	58	37	65	60	57	50	46	38	32
		0.13	1700	81	77	75	70	67	62	41	70	63	59	53	48	42	35
		0.22	2250	84	80	78	73	69	65	45	73	66	61	54	50	44	39
		0.34	2800	86	82	80	75	72	68	48	75	67	63	56	52	46	41
7	16	0.01	570	71	67	64	61	56	50	28	58	55	52	46	41	32	26
		0.06	1140	77	73	71	67	63	58	36	65	60	57	50	46	38	32
		0.13	1710	81	77	75	70	67	62	41	70	63	59	53	48	42	35
		0.19	2100	83	79	77	72	69	64	44	72	65	61	54	50	43	38
	18	0.34	2800	86	82	80	75	72	68	48	75	67	63	56	52	46	41
		0.02	800	73	71	68	65	60	55	32	65	66	62	56	52	48	37
		0.06	1500	78	76	74	70	66	61	38	72	71	67	61	57	53	43
		0.12	2200	82	79	77	73	70	65	42	77	74	70	64	60	56	46
8	18	0.22	2900	84	81	80	76	72	68	45	80	76	72	66	62	58	48
		0.33	3600	86	83	82	78	74	70	48	82	78	74	68	63	60	51
	20	0.01	740	72	70	68	64	60	54	31	64	65	62	55	51	47	37
		0.06	1480	78	76	74	70	66	61	37	72	71	67	60	56	53	43
9	20	0.13	2220	82	79	77	74	70	65	42	77	74	70	64	60	56	46
		0.20	2800	84	81	79	76	72	67	45	79	76	72	66	61	58	48
		0.34	3660	86	83	82	78	74	70	48	82	78	74	68	64	60	51



ENGINEERING DATA

FPP Sound Data

3.0" Inlet Static Pressure

Case	Inlet Size	Pressure Drop	Primary CFM	Discharge, Primary Octave Bands						NC Levels Discharge	Radiated, Primary Octave Bands						NC Levels Radiated
				2	3	4	5	6	7		2	3	4	5	6	7	
2	6	0.01	100	61	58	51	48	48	45	17	47	41	38	33	29	22	-
		0.05	200	72	68	60	58	56	51	30	57	51	47	40	36	29	21
		0.12	300	79	75	65	63	61	55	39	63	57	52	45	41	33	26
		0.21	400	83	79	69	67	64	58	44	67	61	55	48	44	36	31
		0.32	500	87	83	72	70	66	60	49	71	65	58	50	46	38	36
	8	0.01	160	61	61	60	55	50	48	20	55	49	49	42	38	34	23
		0.04	320	72	71	67	63	58	55	32	63	56	56	48	44	40	31
		0.09	480	78	76	71	67	62	59	38	68	61	59	52	48	43	34
		0.17	640	83	80	73	70	65	61	44	71	64	62	54	50	46	37
3	8	0.26	800	86	84	76	73	68	63	48	74	66	64	56	52	48	40
		0.01	180	63	62	61	56	51	49	21	56	50	50	43	39	35	24
		0.05	360	74	72	68	64	59	56	33	64	58	57	49	45	41	32
		0.12	540	80	78	72	68	64	60	40	69	62	60	53	48	44	35
		0.20	700	84	82	74	71	66	62	45	72	65	63	55	51	47	38
	10	0.33	900	88	85	77	74	69	64	50	75	67	65	57	53	49	41
		0.01	275	69	69	66	65	58	50	30	60	56	53	46	40	31	27
		0.05	550	77	76	72	70	64	57	38	70	64	61	53	47	40	36
		0.11	825	82	80	75	73	68	62	43	75	69	65	57	52	45	41
4	10	0.20	1100	86	83	77	75	71	65	48	79	73	68	60	55	48	46
		0.32	1375	89	86	79	77	73	67	51	82	76	71	62	57	51	50
	12	0.01	290	69	69	66	65	58	51	30	61	56	54	47	40	32	29
		0.06	580	78	77	72	70	65	58	39	70	65	61	54	48	40	36
		0.13	870	83	81	75	73	68	62	44	76	70	66	58	52	45	43
	12	0.20	1100	86	83	77	75	71	65	48	79	73	68	60	55	48	46
		0.34	1430	89	86	79	77	73	68	51	83	76	71	63	58	52	52
		0.01	400	70	67	69	66	59	55	27	59	54	52	43	39	35	26
		0.05	800	78	74	75	72	66	62	37	68	62	58	50	46	41	33
5	12	0.12	1200	83	79	78	75	70	66	44	73	66	62	54	49	45	39
		0.21	1600	86	82	80	77	73	69	48	77	69	65	56	52	47	44
		0.32	2000	89	84	82	79	76	72	51	80	72	67	59	54	49	48
	14	0.01	420	70	68	69	67	60	56	28	60	55	52	43	39	36	26
		0.03	840	79	75	75	72	67	63	39	69	62	59	50	46	42	34
		0.07	1260	83	79	78	76	71	67	44	74	67	63	54	50	45	40
		0.13	1600	86	82	80	77	73	69	48	77	69	65	56	52	47	44
	14	0.34	2060	89	84	83	79	76	72	51	80	72	68	59	54	49	48
		0.02	600	77	74	72	68	63	58	36	63	61	58	51	46	38	33
6	14	0.06	1150	83	80	78	74	69	65	44	70	66	62	55	51	44	37
		0.13	1700	87	84	82	77	73	69	49	74	69	65	58	54	47	41
		0.22	2250	90	86	84	80	76	72	53	77	71	67	60	56	50	44
		0.34	2800	92	88	87	82	78	75	55	80	73	68	61	57	52	48
	16	0.01	570	76	73	71	68	62	57	35	62	61	58	51	46	38	33
		0.06	1140	83	80	78	74	69	65	44	70	66	62	55	51	44	37
		0.13	1710	87	84	82	77	73	69	49	74	69	65	58	54	47	41
		0.19	2100	89	86	84	79	75	71	51	76	71	66	59	55	49	43
7	16	0.34	2800	92	88	87	82	78	75	55	80	73	68	61	57	52	48
		0.02	800	78	77	75	72	67	62	39	69	71	69	62	59	55	45
		0.06	1500	83	82	81	78	73	68	45	76	76	73	67	64	60	49
		0.12	2200	87	86	84	81	77	72	50	80	80	76	71	67	63	53
		0.22	2900	89	88	86	83	79	74	52	83	82	78	73	69	65	55
	16	0.33	3600	91	90	88	85	81	76	54	85	84	80	74	70	66	58
		0.01	740	77	77	74	71	66	61	39	68	71	68	62	58	54	44
		0.06	1480	83	82	81	77	73	68	45	76	76	73	67	63	60	49
		0.13	2220	87	86	84	81	77	72	50	80	80	76	71	67	63	53
7	16	0.20	2800	89	88	86	83	79	74	52	83	82	78	72	68	65	55
		0.34	3660	91	90	88	85	81	77	54	86	84	80	75	71	67	58

Terminal
Units

ENGINEERING DATA

FPP Sound Data Notes

Performance Data Notes:

1. Test were conducted in accordance with standard ARI 880-94.
2. Sound power levels are referenced to 10^{-12} watt.
3. Octave bands 2-7 correspond to 125 Hz to 4000 Hz.
4. For ARI Certification data:
 - a. The "Fan Only" test is conducted with the fan operating at the specified airflow and no primary inlet airflow (100% delivered through the induction inlet) with 0.25 in. WC downstream static pressure.
 - b. The "Fan & 100% Primary" test is conducted with the fan operating at the specified airflow with 100% of the airflow being supplied through the primary inlet with 0.25 in. WC downstream static pressure.
5. At ARI Certification test points:
 - a. The "Fan Only" test is conducted at the maximum fan airflow capacity (high tap/speed control set at high) with no primary inlet airflow and 0.25 in. WC. downstream static pressure.
 - b. The "Fan & 100% Primary" test is conducted with the fan operating at the maximum fan airflow capacity (high tap/speed control set at high) with a primary inlet airflow corresponding to the max fan airflow or 2000 fpm air velocity, whichever is less. The operating pressure is 1.5 in. WC. with a downstream static pressure of 0.25 in. WC.
 - c. The electric power is measured during the "Fan Only" test.
 - d. The minimum operating pressure test is conducted with the fan operating at the maximum fan airflow capacity (speed control set at high) with a primary inlet airflow corresponding to the max fan airflow or 2000 fpm air velocity, whichever is less. The downstream static pressure is 0.25 in. WC.

Noise Criteria (NC) Notes:

1. A hyphen (-) indicates the NC is lower than 15.
2. Noise Criteria (NC) were found using standard ARI 885-98 Appendix E (2002 Addendum):
 - a. Radiated NC were found using the type 2 ceiling (mineral fiber) condition.
 - b. Discharge NC were found using the large terminal condition due to the multitude of possible discharge duct sizes.
3. Standard ARI 885-98 Appendix E, Table E1. Typical Sound Attenuation Values, dB:

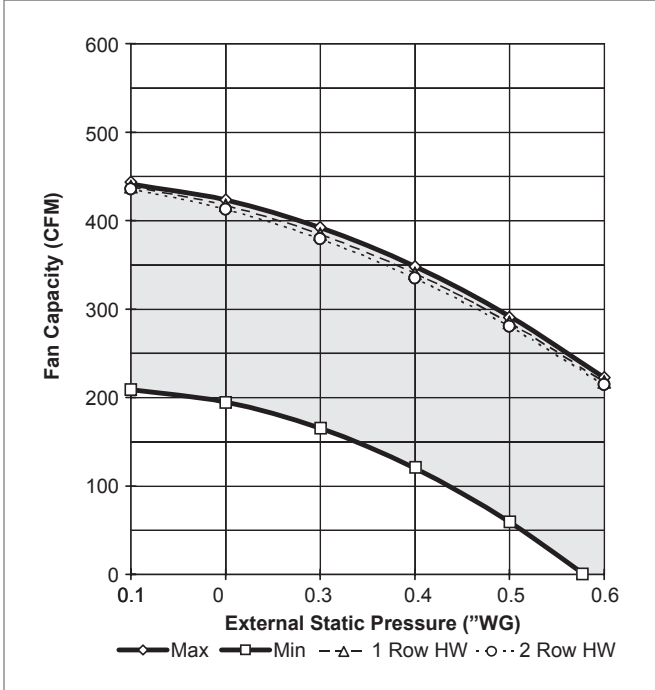
RADIATED	OCTAVE BAND CENTER FREQUENCY (Hz)					
	125	250	500	1000	2000	4000
Type 1 - Glass Fiber	19	19	21	25	29	35
Type 2 - Mineral Fiber	18	19	20	26	31	36
Type 3 - Gypsum Board	23	26	25	27	27	28
DISCHARGE	OCTAVE BAND CENTER FREQUENCY (Hz)					
	125	250	500	1000	2000	4000
Small Terminal	24	28	39	53	59	40
Medium Terminal	27	29	40	51	53	39
Large Terminal	29	30	41	51	52	39



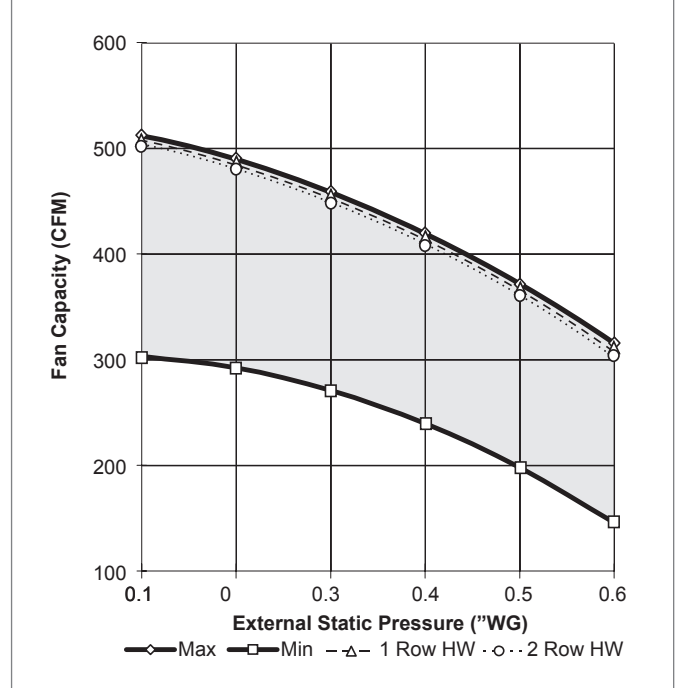
FAN PERFORMANCE

FPP Fan Curves

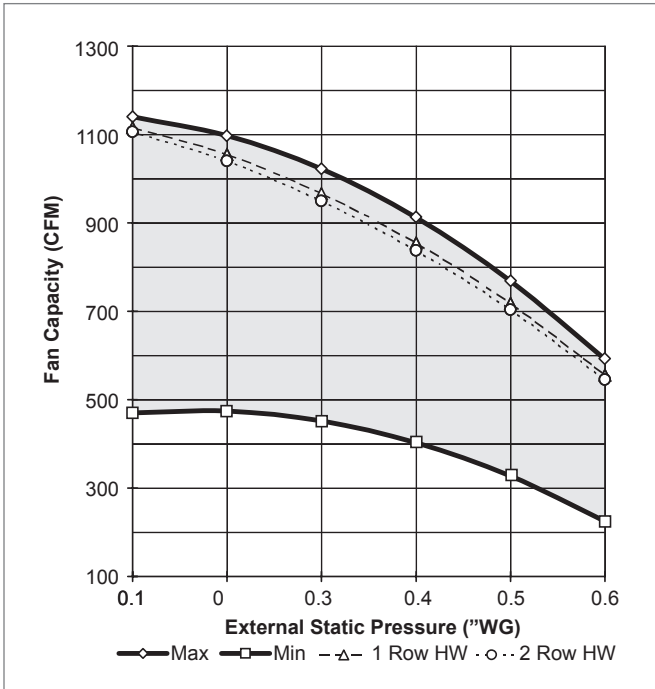
FPP PSC FAN CURVE, UNIT SIZE 2



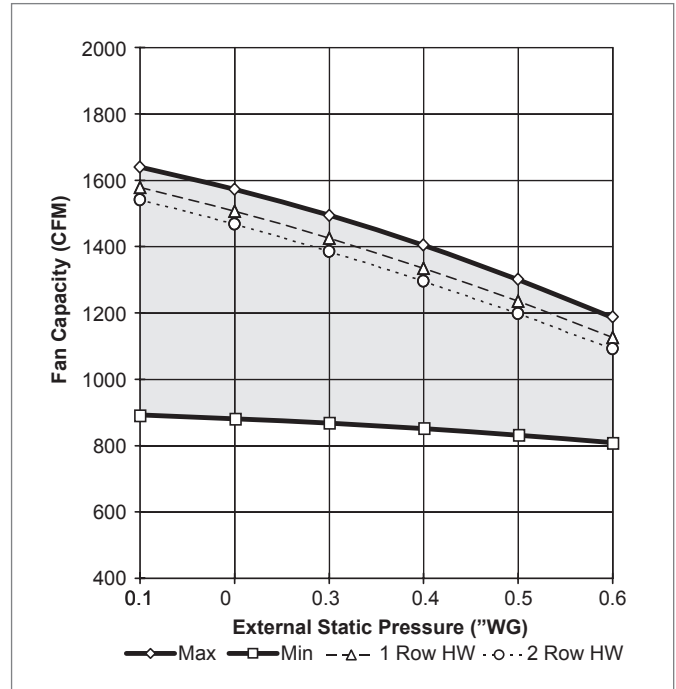
FPP PSC FAN CURVE, UNIT SIZE 3



FPP PSC FAN CURVE, UNIT SIZE 4



FPP PSC FAN CURVE, UNIT SIZE 5



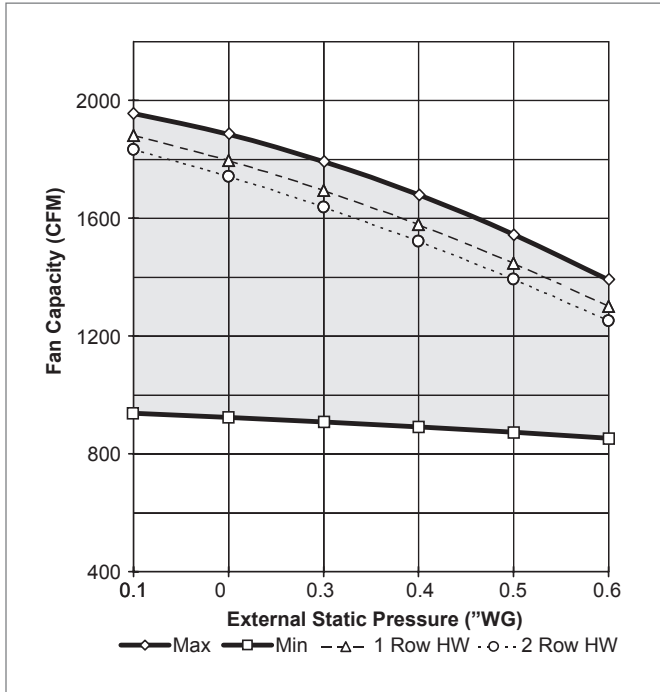
NOTES: Fan speed controller (SCR) is standard with each unit. Fan curves indicate maximum and minimum achievable flow reductions using SCR speed control. Units must be selected to operate within the flow and external static pressure ranges as shown. Fan discharge air volume will be reduced approximately 5% when unit is equipped with optional factory supplied electric heat coils.



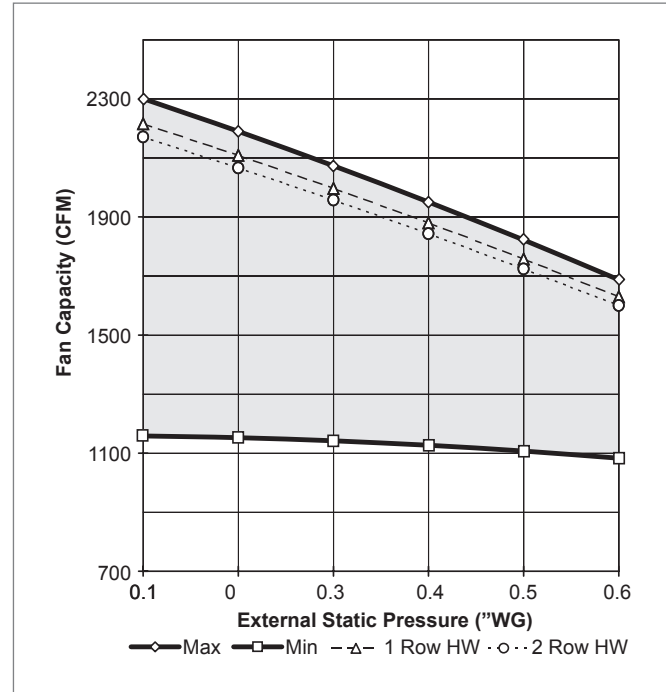
FAN PERFORMANCE

FPP Fan Curves

FPP PSC FAN CURVE, UNIT SIZE 6



FPP PSC FAN CURVE, UNIT SIZE 7



NOTES: Fan speed controller (SCR) is standard with each unit. Fan curves indicate maximum and minimum achievable flow reductions using SCR speed control. Units must be selected to operate within the flow and external static pressure ranges as shown. Fan discharge air volume will be reduced approximately 5% when unit is equipped with optional factory supplied electric heat coils.

Terminal
Units



FPP HOT WATER COIL PERFORMANCE

FPP Hot Water Coil Performance Data, Sizes 2 - 4, 1 & 2 Rows

UNIT SIZE	ROWS	GPM	HEAD LOSS	AIRFLOW, CFM & RESULTING MBH							
				200	225	250	275	300	325	350	375
2	1	1.0	0.13	8.8	9.3	9.8	10.2	10.6	11.0	11.4	11.7
		2.0	0.42	9.6	10.2	10.8	11.3	11.8	12.3	12.8	13.2
		3.0	0.91	9.9	10.6	11.2	11.8	12.3	12.8	13.3	13.8
		4.0	1.56	10.0	10.7	11.4	12.0	12.6	13.1	13.6	14.1
		AIR PRESSURE DROP		0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.03
	2	1.0	0.26	13.8	14.8	15.7	16.6	17.3	18.0	18.7	19.3
		2.0	0.79	15.2	16.4	17.6	18.7	19.8	20.7	21.6	22.5
		4.0	2.91	15.9	17.3	18.7	19.9	21.1	22.2	23.3	24.3
		6.0	6.31	16.2	17.6	19.0	20.3	21.6	22.8	23.9	25.0
		AIR PRESSURE DROP		0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05

UNIT SIZE	ROWS	GPM	HEAD LOSS	AIRFLOW, CFM & RESULTING MBH							
				300	340	380	420	460	500	540	575
3	1	1.0	0.13	10.6	11.2	11.7	12.2	12.6	13.0	13.4	13.7
		2.0	0.42	11.8	12.6	13.3	13.9	14.5	15.0	15.5	15.9
		3.0	0.91	12.3	13.1	13.9	14.5	15.2	15.8	16.3	16.8
		4.0	1.56	12.6	13.4	14.2	14.9	15.6	16.2	16.8	17.2
		AIR PRESSURE DROP		0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.05
	2	1.0	0.27	17.3	18.4	19.4	20.3	21.1	21.9	22.5	23.1
		2.0	0.79	19.8	21.3	22.7	24.0	25.2	26.3	27.3	28.2
		4.0	2.91	21.1	22.9	24.5	26.1	27.6	28.9	30.2	31.3
		6.0	6.30	21.6	23.5	25.2	26.9	28.4	29.9	31.3	32.4
		AIR PRESSURE DROP		0.04	0.05	0.05	0.06	0.07	0.09	0.10	0.11

UNIT SIZE	ROWS	GPM	HEAD LOSS	AIRFLOW, CFM & RESULTING MBH							
				475	550	625	700	775	850	925	1000
4	1	1.0	0.17	15.3	16.2	16.9	17.6	18.2	18.7	19.2	19.7
		2.0	0.53	17.6	18.8	19.9	20.9	21.8	22.6	23.3	24.0
		3.0	1.13	18.5	19.8	21.1	22.2	23.2	24.1	25.0	25.8
		4.0	1.94	19.0	20.4	21.7	22.9	24.0	24.9	25.9	26.7
		AIR PRESSURE DROP		0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07
	2	1.0	0.33	24.4	26.0	27.3	28.5	29.5	30.4	31.2	31.9
		2.0	1.00	29.2	31.6	33.8	35.7	37.5	39.1	40.5	41.9
		4.0	3.66	31.9	35.0	37.7	40.2	42.6	44.7	46.7	48.5
		6.0	7.94	32.9	36.2	39.2	41.9	44.5	46.9	49.1	51.1
		AIR PRESSURE DROP		0.04	0.05	0.07	0.08	0.09	0.11	0.12	0.14

MBH CORRECTION FACTORS FOR OTHER ENTERING CONDITIONS											
DELTA-T	50	60	70	80	90	100	115	125	140	150	
FACTOR	0.44	0.52	0.61	0.70	0.79	0.88	1.00	1.07	1.20	1.30	

NOTES: Hot water capacities are in MBH. Data is based upon 180°F entering water with 0% Glycol and 65°F entering air. Head loss is in feet of water. Air Temperature Rise = 927xMBH/CFM. Water Temperature Drop = 2.04xMBH/GPM. Coils are not for steam application. Contact your local Krueger representative for steam coil information. Tables are based upon a temperature difference of 115°F between entering air and entering water. For other temperature differences, multiply MBH values by correction factors provided. See selection software for specific hot water coil data. Airside ΔPs is defined as the minimum static pressure at the maximum CFM with the damper full open.

Terminal
Units



FPP HOT WATER COIL PERFORMANCE

FPP Hot Water Coil Performance Data, Sizes 5 - 7, 1 & 2 Rows

UNIT SIZE	ROWS	GPM	HEAD LOSS	AIRFLOW, CFM & RESULTING MBH							
				900	975	1050	1125	1200	1275	1350	1400
5	1	1.0	0.20	20.8	21.3	21.8	22.3	22.7	23.0	23.4	23.6
		2.0	0.62	25.3	26.1	26.8	27.5	28.2	28.8	29.3	29.7
		3.0	1.33	27.1	28.0	28.9	29.7	30.4	31.1	31.8	32.3
		4.0	2.29	28.0	29.0	30.0	30.9	31.7	32.5	33.2	33.7
		AIR PRESSURE DROP		0.04	0.05	0.06	0.06	0.07	0.08	0.09	0.09
	2	1.0	0.41	32.9	33.6	34.4	35.0	35.6	36.1	36.6	36.9
		2.0	1.18	42.8	44.4	45.8	47.1	48.3	49.4	50.5	51.1
		4.0	4.34	49.3	51.4	53.4	55.3	57.0	58.7	60.3	61.3
		6.0	9.40	51.8	54.2	56.4	58.5	60.5	62.4	64.2	65.4
		AIR PRESSURE DROP		0.09	0.10	0.11	0.13	0.14	0.15	0.17	0.18

UNIT SIZE	ROWS	GPM	HEAD LOSS	AIRFLOW, CFM & RESULTING MBH							
				1000	1100	1200	1300	1400	1500	1600	1700
6	1	1.0	0.21	22.6	23.2	23.8	24.3	24.8	25.3	25.7	26.0
		2.0	0.66	27.7	28.8	29.7	30.6	31.4	32.1	32.8	33.5
		3.0	1.42	29.8	31.0	32.1	33.2	34.1	35.0	35.8	36.6
		4.0	2.45	31.0	32.3	33.5	34.6	35.7	36.6	37.6	38.4
		AIR PRESSURE DROP		0.04	0.05	0.06	0.07	0.08	0.08	0.09	0.10
	2	1.0	0.44	35.0	36.0	36.8	37.5	38.1	38.7	39.2	39.7
		2.0	1.27	46.6	48.5	50.2	51.8	53.2	54.5	55.7	56.9
		4.0	4.65	54.2	56.9	59.5	61.8	64.0	66.0	67.9	69.7
		6.0	12.54	59.0	62.2	65.2	68.0	70.6	73.1	75.5	77.7
		AIR PRESSURE DROP		0.11	0.13	0.16	0.18	0.20	0.23	0.25	0.28

UNIT SIZE	ROWS	GPM	HEAD LOSS	AIRFLOW, CFM & RESULTING MBH							
				1200	1310	1420	1530	1640	1750	1860	1950
7	1	1.0	0.21	23.8	24.4	24.9	25.4	25.8	26.2	26.6	26.9
		2.0	0.66	29.7	30.7	31.5	32.3	33.1	33.8	34.4	34.9
		3.0	1.42	32.1	33.3	34.3	35.3	36.2	37.0	37.8	38.4
		4.0	2.45	33.5	34.7	35.9	36.9	37.9	38.8	39.7	40.4
		AIR PRESSURE DROP		0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13
	2	1.0	0.44	36.8	37.6	38.3	38.9	39.4	39.9	40.4	40.7
		2.0	1.27	50.2	51.9	53.5	54.9	56.2	57.4	58.5	59.3
		4.0	4.65	59.5	62.0	64.4	66.6	68.6	70.6	72.3	73.7
		6.0	12.56	65.2	68.3	71.2	73.9	76.4	78.8	81.1	82.8
		AIR PRESSURE DROP		0.16	0.18	0.21	0.23	0.26	0.29	0.32	0.35

MBH CORRECTION FACTORS FOR OTHER ENTERING CONDITIONS											
DELTA-T	50	60	70	80	90	100	115	125	140	150	
FACTOR	0.44	0.52	0.61	0.70	0.79	0.88	1.00	1.07	1.20	1.30	

NOTES: Hot water capacities are in MBH. Data is based upon 180°F entering water with 0% Glycol and 65°F entering air. Head loss is in feet of water. Air Temperature Rise = 927xMBH/CFM. Water Temperature Drop = 2.04xMBH/GPM. Coils are not for steam application. Contact your local Krueger representative for steam coil information. Tables are based upon a temperature difference of 115°F between entering air and entering water. For other temperature differences, multiply MBH values by correction factors provided. See selection software for specific hot water coil data. Airside ΔPs is defined as the minimum static pressure at the maximum CFM with the damper full open.

ENGINEERING DATA

Electric Reheat Coil

Standard Features

- 80/20 NiCr element wire
- Flanged duct connection
- Airflow switch
- Automatic reset thermal cutout switch
- Magnetic contactor (1 per stage)
- Control transformer (except pneumatic controls)
- NEMA 1 enclosure for electric heat controls
- Single point power connection

Optional Features

- Mercury contactors
- Fused door interlocking disconnect
- Fusing
- Non-fused door interlocking disconnect
- Manual reset thermal cutout
- Up to three stages of control

Table 1 - Available kW Ranges

120V / 1 ϕ

Unit Size	KW Min	KW Max
2	0.5	4.5
3	0.5	4.5
4	0.5	4.5
5	0.5	4.5
6	0.5	4.5
7	0.5	3

208V / 1 ϕ

Unit Size	KW Min	KW Max
2	0.5	6
3	0.5	7.5
4	0.5	7.5
5	0.5	7.5
6	0.5	7.5
7	0.5	7.5

240V / 1 ϕ

Unit Size	KW Min	KW Max
2	1.0	6
3	1.0	9
4	1.0	9
5	1.0	9
6	1.0	9
7	1.0	9

277V / 1 ϕ

Unit Size	KW Min	KW Max
2	1.0	6
3	1.0	11
4	1.0	11
5	1.0	11
6	1.0	11
7	1.0	11

208V / 3 ϕ

Unit Size	KW Min	KW Max
2	1.5	6
3	1.5	11
4	1.5	13.5
5	1.5	13.5
6	1.5	13.5
7	1.5	13.5

480V / 3 ϕ (4 wire)

Unit Size	KW Min	KW Max
2	2.5	6
3	2.5	11
4	2.5	15
5	2.5	16
6	2.5	23
7	2.5	32

General Notes on Electric Heat Availability:

1. Minimum 1/2 kW per step
2. Maximum 100°F leaving air temperature
3. For single phase heaters, the motor voltage is equal to the heater voltage
4. For 208V / 3 ϕ heaters, the motor voltage is 208V / 1 ϕ
5. For 480V / 3 ϕ heaters, the motor voltage is 277V / 1 ϕ



ENGINEERING DATA

Electric Reheat Coil

Selection Guidelines

Electric heat kW ranges are shown in Table 1. In all cases, the leaving air temperature of the unit must not exceed 100°F.

Validate Leaving Air Temperature (LAT) - Leaving air must not exceed 100°F

$$LAT = \frac{kW \times 3160}{CFM} + EAT$$

LAT = Leaving air temperature in °F

kW = Electric heat capacity in kW

CFM = Fan airflow in CFM

EAT = Entering air temperature in °F (Note: this is mixture of plenum and primary air)

Determining Mixed Air Temperature

$$EAT_{Total} = EAT_{Primary} \times (CFM_{Primary} / CFM_{Fan}) + EAT_{Plen} \times ((CFM_{Fan} - CFM_{Primary}) / CFM_{Fan})$$

LAT = leaving air temp in °F

CFM_{Primary} = Airflow from inlet in heating mode in CFM

CFM_{Fan} = Airflow from fan in CFM - for FPC this is also the total CFM

EAT_{Total} = Entering air to the heater in °F

EAT_{Primary} = Primary entering air temperature for the heating mode in °F

EAT_{Plen} = Plenum entering air temperature in °F

Minimum Circuit Ampacity (MCA)*

$$MCA = (\text{Motor Current} + \text{Heater Current}) \times 1.25$$

Maximum Overcurrent Protection (MOP)*

$$MOP = (2.25 \times \text{Motor Current of largest motor}) + \text{Sum of other motor current} + \text{Heater current}$$

MOP Rules

1. If MOP is less than 15, MOP shall be set to 15
2. If MOP is greater than the MCA and is between standard fuse sizes, round down to the next standard fuse size
 - a. Exception - If the next lower fuse size is less than 125% of the current rating of the electric heater load, round up to next standard fuse size
3. If MOP is less than the MCA, the MOP shall be set equal to MCA and then rounded up to the next standard fuse size.

Helpful Equations

$$kW = \frac{MBH}{3.414}$$

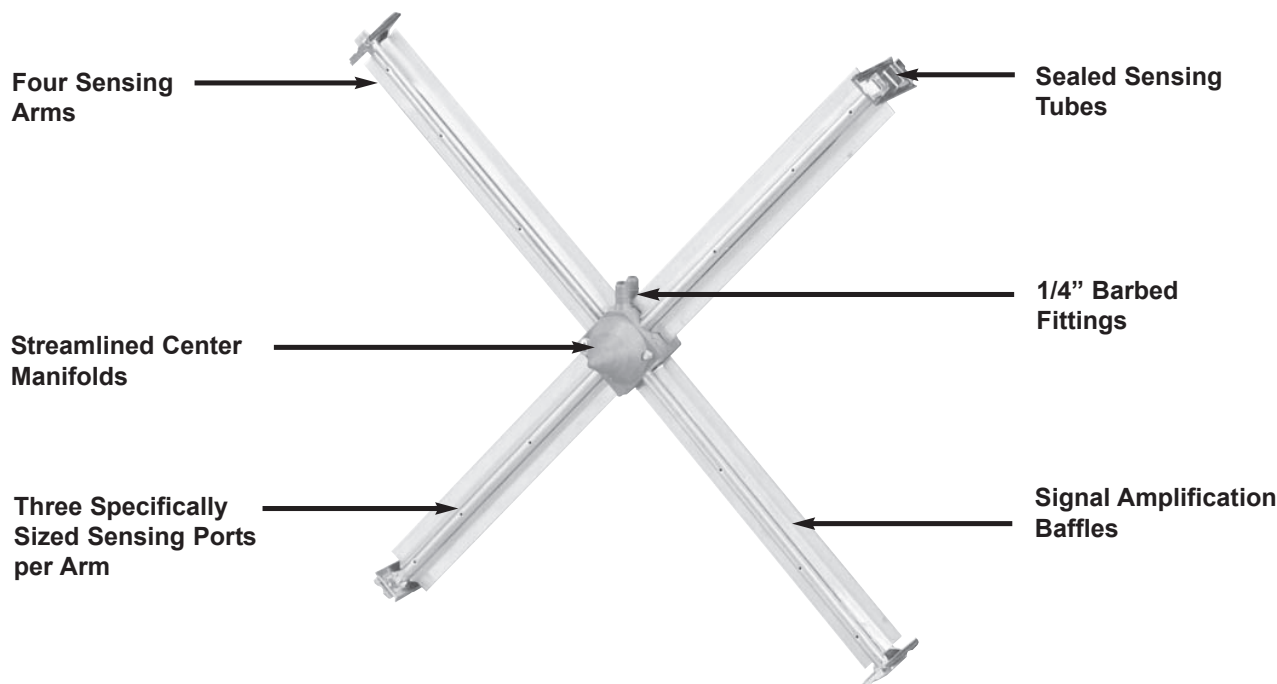
$$\text{Single Phase Amperage Draw} = \frac{kW \times 1000}{\text{Voltage}}$$

$$\text{Three Phase Amperage Draw} = \frac{kW \times 1000}{\text{Voltage} \times 1.732}$$

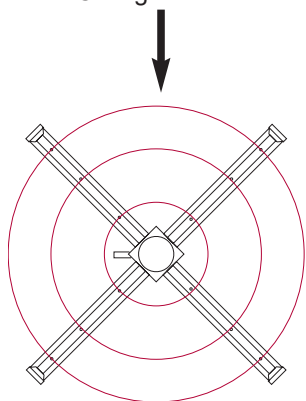
*MCA and MOP equations and rules are intended as an aid in design. See UL 1995 for Heating and Cooling Equipment for complete requirements.

ENGINEERING DATA

FLO-CROSS



Upstream and Downstream
Concentric Ring Sensing
Port Configuration



Patent No. 4,453,419

- Patented Flo-Cross® (Patent No. 4,453,419) is accurate to $\pm 5\%$ throughout the cataloged operating range
- Sensing arms sample the inlet cross section mitigating turbulent flow effects
- Barbed fittings positively lock plastic tubing
- 24 total sensing ports provide a differential pressure (ΔP) output proportional to the average duct velocity
- Amplification baffles strengthen ΔP signals to levels three times higher than standard Pitot tube readings
- Center manifolds average velocity profiles and reduce pulsations from dynamic ΔP signals
- Sensing tube constructions eliminates signal loss due to leakage
- Concentric ring sensing port configuration imitates major flow testing standards by locating them at the center of equal areas
- Corrosion resistant aluminum construction

Flo-Cross® Sensor Performance Parameters/Formulas

Size	Area (ft ²)	CV	K*
04	0.0819	209	2.8
05	0.1296	315	3
06	0.1883	462	2.9
08	0.3382	817	2.9
10	0.5319	1250	3
12	0.7691	1792	3
14	1.05	2474	3
16	1.3745	3235	3

* "K" is the amplification factor

- Flow (CFM) = $C_v \times \sqrt{\Delta P}$
- ΔP (Inches W.G.) = $K \times \left(\frac{FPM}{4005} \right)^2$
- $FPM = \frac{CFM}{Area (sq.ft)}$
- 500 to 3000 FPM Nominal Velocity Range