Parallel Flow Fan Powered Terminal (Model TVS)

Model TVS fan terminals are specifically designed for quiet operation. They also offer improved space comfort and flexibility for a wide variety of Heating, Ventilation, and Air Conditioning (HVAC) systems. This is critical in today's buildings where occupants are placing more emphasis on indoor acoustics.

Due to heightened interest in indoor air quality, many HVAC system designers are focusing on the effects of particulate contamination within a building's occupied space. Often, HVAC system noise is overlooked as a source of occupied space contamination. The TVS Terminal is specifically designed to eliminate obtrusive fan noise from reaching the occupants.

Figure 1: Parallel Flow Fan Powered Terminal (Model TVS)

Dimensional Data

Model TVS

Table 1: Dimensional Data in Inches/

Unit Size	A	B	C	I	X	Y	W	H	L
0404	10 1/2"	5"	7"	3 7/8"	8"	7"	29"	14"	23 1/2"
0504	10 1/2"	5"	7"	4 7/8"	8"	7"			
0604	6 1/2"	5"	7"	5 7/8"	8"	7"			
0606									
0804	6 1/2"	6"	7"	7 7/8"	11"	7"			
0806									
0811									
1006	6 1/2"	7"	8 1/2"	9 7/8"	14"	10"	37"	17"	29 1/2"
1011									
1018									
1211	6 1/2"	8"	8 1/2"	11 7/8"	16"	10"			
1218									
1221									
1411	6 1/2"	9"	9 1/2"	13 7/8"	22"	12"	45"	19"	
1418									
1421									
1424	6 1/2"	9"	9 1/2"	13 7/8"	22"	12"	49"		
1621	6 1/2"	10"	9 1/2"	15 7/8"	24"	12"	45"		
1624	6 1/2"	10"	9 1/2"	15 7/8"	24"	12"	49"		

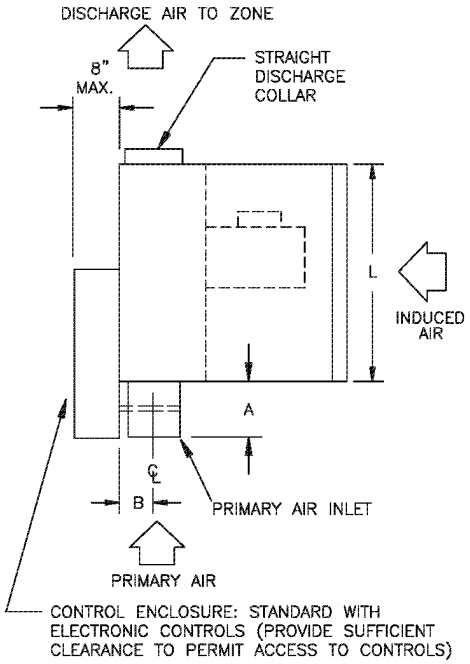

Figure 2: Dimensions - Model TVS (Top View)

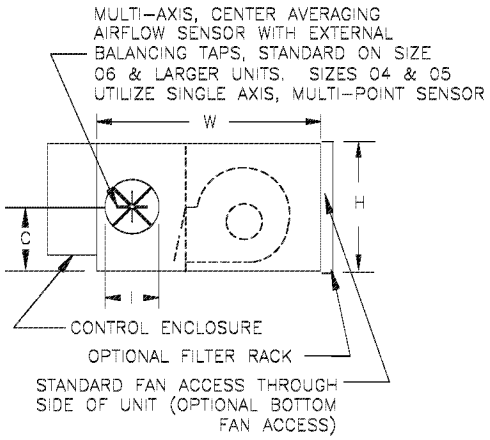

Figure 3: Dimensions - Model TVS (Side View)

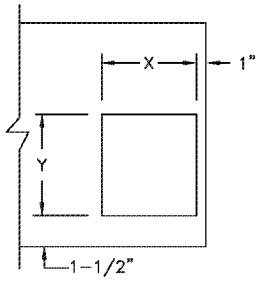

Figure 4: Dimensions - Model TVS (Discharge Collar Detail)

Model TVS-W Hot Water Coil Detail

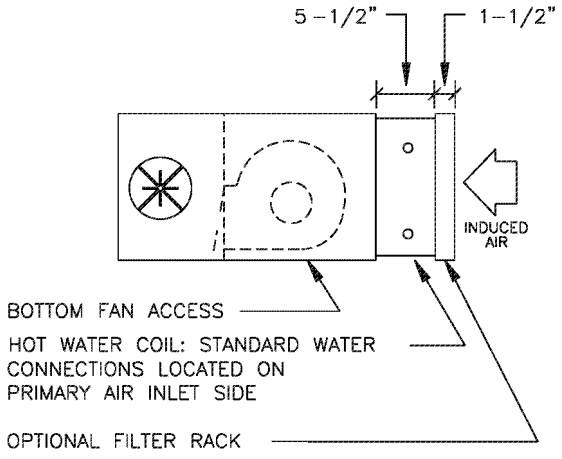

Figure 5: Dimensions - Model TVS-W (End View)

Model TVS-E

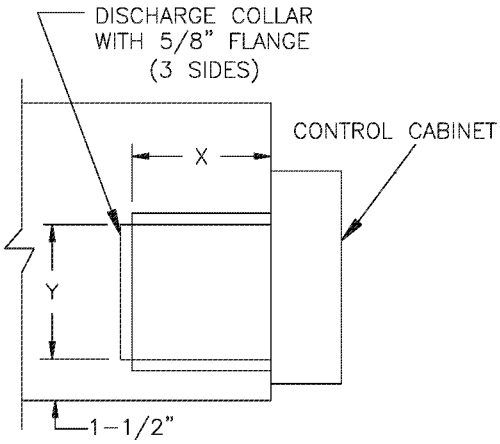

Figure 6: Dimensions – Model TVS-E (Discharge Collar Detail)

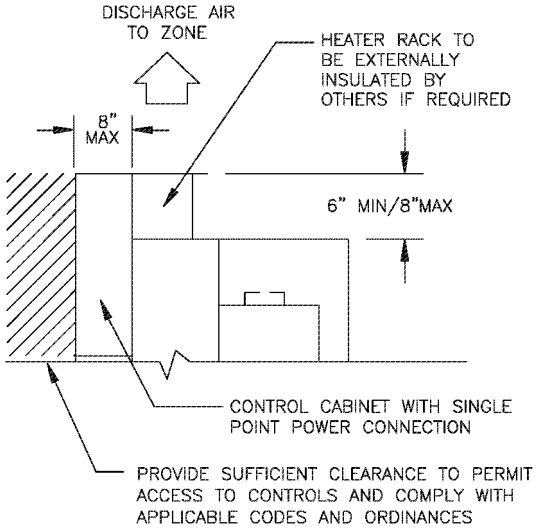

Figure 7: Dimensions – Model TVS-E (Electric Heater Detail, Top View)

Model TVS Arrangements

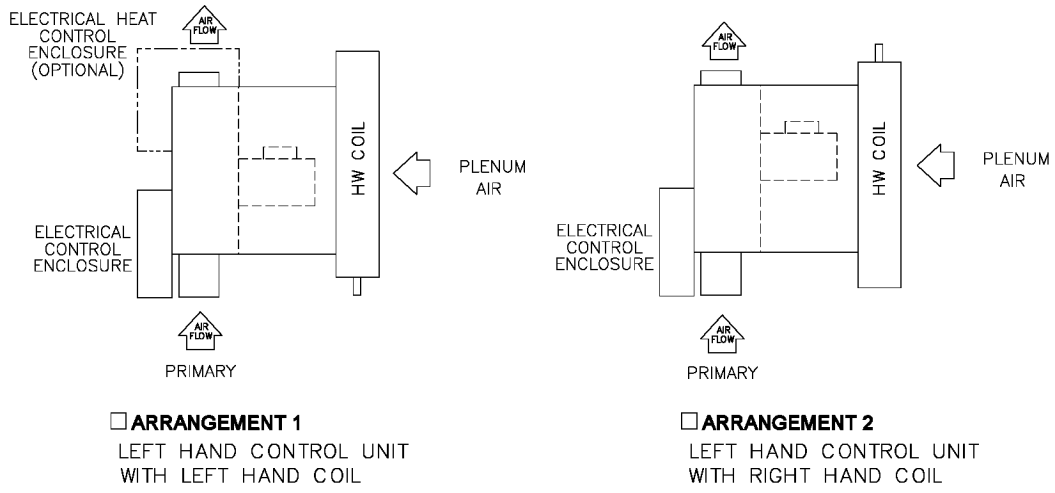

Figure 8: Model TVS Arrangements 1 - 2

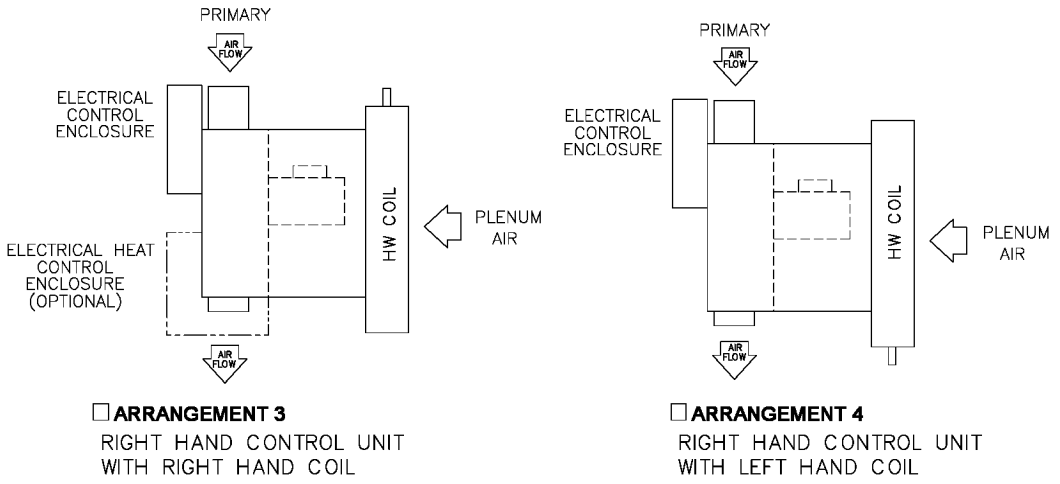

Figure 9: Model TVS Arrangements 3 - 4

Primary Airflow Calibration

Flow Crossing Calibration Chart

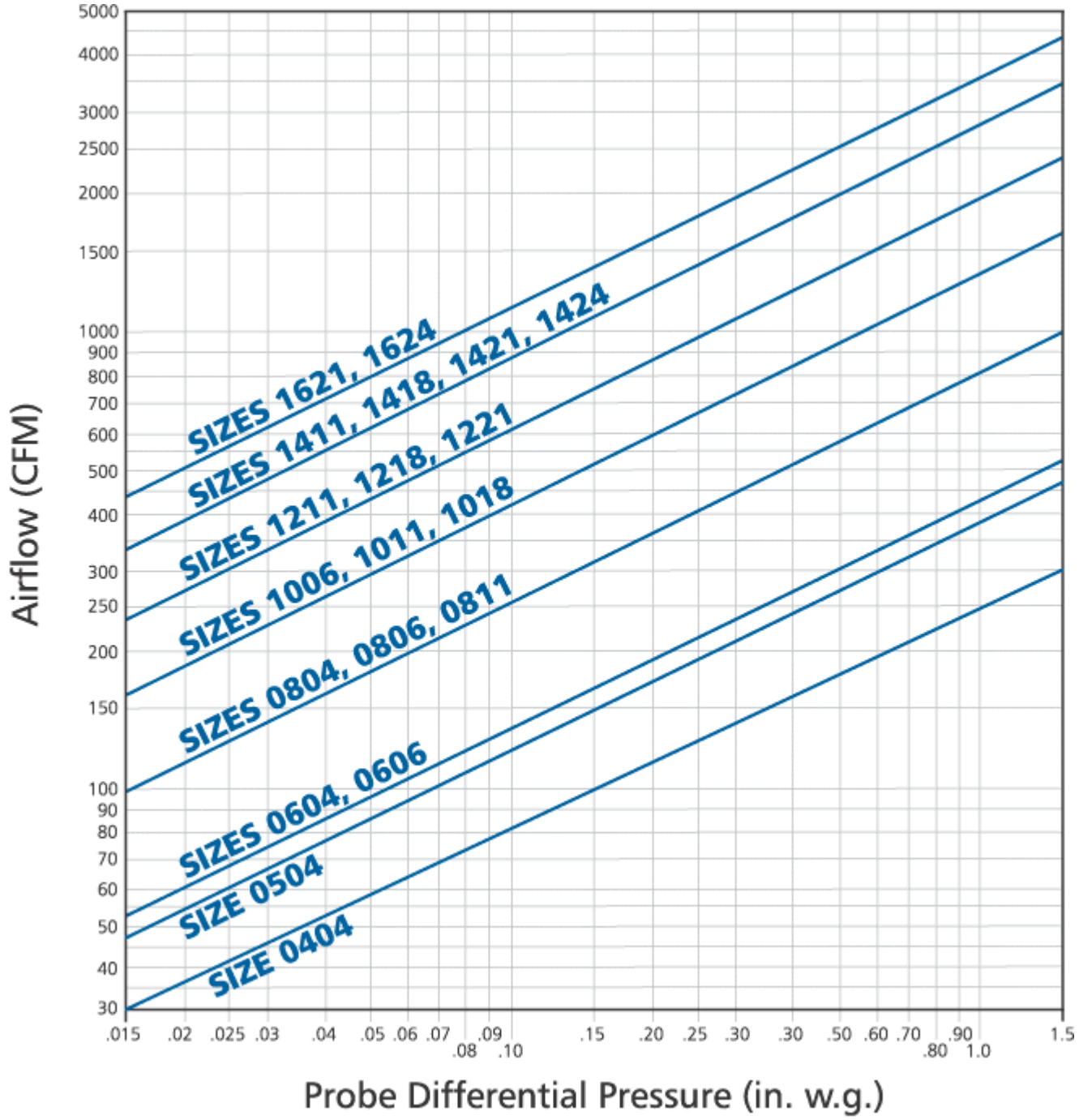

Figure 10: Flow Crossing Calibration

Note: Maximum and minimum Cubic Feet per Minute (CFM) limits are dependent on the type of controls that are used. See Table 2 for specific values.

Airflow Ranges (CFM)

Table 2: Airflow Ranges

Unit Size	Pneumatic Controls		VMA Series Digital Controls		LN Series Controls		DDC				
							Min.			Max.	
	Min.	Max.	Min.	Max.	Min.	Max.	Min. transducer differential pressure (in. wg)			Max. transducer differential pressure (in. wg)	
							0.015	0.03	0.05	1.0	≥1.5
0404	43	250	35	250	6	250	30	43	55	250	250
0504	68	350	50	350	10	350	48	68	88	350	350
0604 0606	75	490	60	550	14	530	53	75	97	435	530
0804 0806 0811	145	960	115	1000	25	1000	105	145	190	840	1000
1006 1011 1018	235	1545	185	1600	65	1600	165	235	305	1360	1600
1211 1218 1221	340	2250	285	2300	188	2300	240	340	440	1980	2300
1411 1418 1421 1424	475	3100	390	3100	254	3100	335	475	615	2750	3100
1621 1624	625	4100	520	4100	665	4100	440	625	805	3595	4100

Note: Minimum and maximum airflow limits are dependent on the specific Direct Digital Controls (DDC) controller supplied. Contact the control vendor to obtain the minimum and maximum differential pressure limits (inches wg) of the transducer used with the DDC controller. Maximum CFM is limited to value shown in General Selection Data.

LN Series Controls Assumptions:

The jumper is set for 0.5” for box sizes 4”, 6”, 8”, and 10”.

The jumper is set for 1” for box sizes 12” and 14”.

The jumper is set for 2” for box size 16”.

General Selection Data

Table 3: General Selection Data – Primary Air Valve

Unit Size	CFM	Min. ΔPs (in. wg)	Room Noise Criteria (NC)					
			0.5" wg ΔPs		1.0" wg ΔPs		3.0" wg ΔPs	
			Dis.	Rad.	Dis.	Rad.	Dis.	Rad.
0404	100	.01	--	--	--	--	--	--
	150	.01	--	--	--	--	20	23
	200	.02	--	--	--	23	25	29
	250	.02	--	23	23	27	30	34
0504	100	.01	--	--	--	--	--	--
	200	.01	--	--	--	--	--	22
	300	.02	--	--	--	22	20	28
	350	.02	--	20	--	24	23	30
0604 0606	200	.03	--	--	--	--	--	22
	250	.04	--	--	--	--	--	24
	300	.06	--	--	--	--	--	25
	350	.08	--	--	--	20	--	28
	450	.14	--	22	--	25	24	32
	550	.21	--	29	23	29	28	34
0804 0806 0811	300	.01	--	--	--	--	--	29
	400	.03	--	--	--	20	--	32
	500	.04	--	--	--	23	22	33
	600	.06	--	22	--	25	25	35
	800	.10	--	27	20	30	29	38
	1000	.15	20	32	24	35	32	40
1006 1011 1018	600	.01	--	--	--	24	24	32
	800	.01	--	23	--	27	25	35
	1000	.01	--	25	--	29	28	37
	1200	.02	--	29	20	32	30	40
	1400	.02	--	33	23	33	33	42
	1600	.03	22	34	25	35	34	44
1211 1218 1221	800	.01	--	20	--	24	24	34
	1100	.02	--	24	--	28	28	37
	1400	.04	--	28	22	32	32	40
	1700	.06	--	32	24	34	35	45
	2000	.08	--	35	25	38	38	48
	2300	.10	22	37	28	40	40	50
1411 1418 1421 1424	1100	.02	--	--	--	23	25	33
	1500	.04	--	22	20	28	32	40
	1900	.06	--	24	24	33	35	44
	2300	.08	--	28	27	37	38	47
	2700	.12	22	30	28	38	43	50
	3100	.15	25	33	30	42	47	52

Continued on next page . . .

Unit Size (Cont.)	CFM	Min. ΔPs (in. wg)	Room Noise Criteria (NC)					
			0.5" wg ΔPs		1.0" wg ΔPs		3.0" wg ΔPs	
			Dis.	Rad.	Dis.	Rad.	Dis.	Rad.
1621 1624	1600	.01	--	24	--	33	29	42
	2100	.02	--	28	23	37	33	47
	2600	.03	22	30	28	39	36	49
	3100	.04	24	35	33	42	40	50
	3600	.05	25	37	37	43	44	54
	4100	.07	27	38	38	45	50	57

Table 4: General Selection Data – Fan

Unit Size	CFM	Room Noise Criteria (NC)	
		Discharge	Radiated
0404 0504 0604 0804	200	--	26
	300	--	32
	400	--	35
	450	--	36
0606 0806 1006	300	--	27
	400	--	34
	500	--	37
0811 1011 1211 1411	400	--	29
	700	--	33
	1000	20	39
1018 1218 1418	800	--	33
	1100	--	35
	1400	20	37
	1800	28	43
1221 1421 1621	1200	--	34
	1600	20	38
	2000	28	43
1424 1624	1500	--	35
	1900	23	39
	2400	30	44

Notes:

Min. ΔPs is the static pressure difference between the terminal inlet and discharge with the damper wide open. Terminals equipped with electric heat (Model TVS-E) require the addition of the heater pressure drop to determine the cumulative minimum ΔPs for the unit.

Performance data obtained from tests conducted in accordance with Air Conditioning and Refrigeration Institute (ARI) Standard 880.

Dash (-) indicates NC level less than 20.

NC values calculated based upon the 2002 Addendum to ARI Standard 885 Appendix E Typical Sound Attenuation Values, using Ceiling Type 2 for calculating Radiated NC.

NC (sound pressure) levels predicted by subtracting appropriate values below from published sound power levels

Table 5: Discharge Attenuation Values

Discharge Attenuation Values	Octave Band					
	2	3	4	5	6	7
Small Box (< 300 CFM)	24	28	39	53	59	40
Medium Box (300-700 CFM)	27	29	40	51	53	39
Large Box (> 700 CFM)	29	30	41	51	52	39

Table 6: Radiated Attenuation Values

Radiated Attenuation Values	Octave Band					
	2	3	4	5	6	7
Type 2 - Mineral Fiber Ceiling	18	19	20	26	31	36

Table 7: Horsepower/Amperage Data

Unit Size	Fan Horsepower			Amperage					
				@ 115 Volts			@ 277 Volts		
	Low	Med	Hi	Low	Med	Hi	Low	Med	Hi
0404, 0504, 0604, 0804	1/60	1/25	1/12	0.5	0.8	1.1	.37	.45	.50
0606, 0806, 1006	1/10	1/8	1/6	1.8	2.1	2.6	.65	.80	.90
0811, 1011, 1211, 1411	1/8	1/5	1/4	3.2	4.1	4.9	1.3	1.6	1.9
1018, 1218, 1418	1/4	1/3	1/2	6.9	7.9	8.8	2.7	3.2	3.6
1221, 1421, 1621	1/3	1/2	3/4	7.7	9.0	9.7	2.9	3.4	3.8
1424, 1624	1/2	3/4	1	8.9	11.0	12.3	3.4	3.8	4.5

Sound Power Data

Table 8: Primary Air Valve – Radiated

Unit Size	CFM	0.5" wg ΔPs						1.0" wg ΔPs						3.0" wg ΔPs					
		Octave Band Numbers						Octave Band Numbers						Octave Band Numbers					
		2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
0404	100	49	42	36	29	29	29	52	45	39	30	30	29	54	47	44	36	33	33
	150	52	45	38	31	29	29	57	49	42	33	31	29	60	53	48	39	35	34
	200	57	48	40	33	29	29	60	52	44	35	32	30	65	57	51	41	37	36
	250	60	52	44	36	30	30	63	54	47	38	33	31	69	61	53	43	39	37
0504	100	46	39	35	29	26	27	48	41	39	30	27	28	53	44	42	37	34	34
	200	51	43	38	30	27	28	54	45	41	33	29	29	59	51	48	40	36	35
	300	55	47	42	34	29	29	59	49	45	36	31	30	64	56	51	43	37	36
	350	58	50	44	36	30	29	61	52	47	38	33	31	66	57	52	44	38	37
0604 0606	200	47	40	37	32	27	28	51	44	41	35	29	28	57	51	48	41	34	32
	250	49	42	39	34	29	28	53	46	43	36	30	28	59	53	50	42	35	32
	300	52	45	41	36	30	28	56	47	44	38	31	28	62	55	51	43	36	33
	350	55	47	43	37	32	29	57	49	46	39	33	29	64	57	52	44	37	33
	450	59	52	46	39	33	29	62	54	49	42	36	31	67	60	55	47	40	35
	550	65	56	50	42	35	31	65	57	52	43	37	32	69	62	57	48	41	36
0804 0806 0811	300	51	43	39	33	28	26	57	50	45	37	31	28	62	57	54	47	38	35
	400	53	45	40	35	29	27	58	51	46	39	32	29	65	61	57	48	40	36
	500	56	47	42	36	31	28	60	52	47	40	34	30	66	62	58	49	41	37
	600	59	49	44	37	33	29	62	53	48	41	36	31	68	64	59	50	43	38
	800	63	53	47	40	36	30	66	56	50	44	39	32	71	67	60	51	45	39
	1000	67	57	51	43	38	32	70	60	54	46	41	34	74	69	61	52	46	41
1006 1011 1018	600	57	48	41	34	29	27	61	52	46	38	32	29	67	60	56	48	39	35
	800	60	51	44	37	31	28	63	54	48	40	33	30	70	62	58	50	41	38
	1000	62	52	45	39	33	29	65	56	50	43	37	34	71	64	59	51	43	39
	1200	65	55	48	41	35	32	67	58	52	45	39	36	74	65	60	52	46	43
	1400	68	58	51	44	38	34	68	60	54	46	40	37	75	67	61	54	47	46
	1600	69	60	52	45	39	35	70	62	56	48	42	38	77	68	62	55	49	47
1211 1218 1221	800	58	48	42	36	29	27	61	53	47	39	33	30	68	63	57	48	42	39
	1100	61	52	46	38	31	28	64	55	49	41	35	31	71	65	59	50	44	40
	1400	64	56	48	40	33	29	67	58	52	43	37	33	74	67	61	52	45	41
	1700	67	59	52	43	36	31	69	61	54	46	39	35	78	69	63	54	47	43
	2000	70	61	54	46	38	33	72	63	57	48	41	36	80	71	64	55	49	45
	2300	71	63	56	47	40	35	74	65	59	50	43	38	82	72	66	57	51	47
1411 1418 1421 1424	1100	55	46	41	34	28	28	60	52	46	38	31	30	68	62	56	46	40	38
	1500	59	49	43	36	30	29	64	55	48	40	33	31	74	66	59	50	42	39
	1900	61	52	45	38	32	30	68	57	49	42	35	33	77	68	61	51	45	42
	2300	64	54	47	40	34	31	71	59	51	44	38	35	79	69	62	52	46	43
	2700	66	56	49	42	36	33	72	61	53	46	40	38	82	70	63	54	48	46
	3100	68	58	51	44	38	34	75	62	55	47	42	40	83	71	63	55	49	47

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Unit Size (Cont.)	CFM	0.5" wg ΔPs						1.0" wg ΔPs						3.0" wg ΔPs					
		Octave Band Numbers						Octave Band Numbers						Octave Band Numbers					
		2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
1621 1624	1600	61	53	47	37	30	28	68	60	53	43	36	32	75	69	62	52	45	42
	2100	64	56	49	42	34	31	71	62	55	46	39	35	79	73	66	56	49	45
	2600	66	58	51	43	37	33	73	64	56	48	40	36	81	74	67	57	50	46
	3100	70	60	53	44	38	34	75	65	58	50	42	37	82	76	68	59	51	47
	3600	71	61	54	46	39	35	76	66	59	51	43	39	84	77	69	61	52	48
	4100	72	63	57	48	40	36	78	68	60	52	44	40	86	78	70	62	55	51

Notes:

Data obtained from tests conducted in accordance with ARI Standard 880.

Sound levels are expressed in decibels, dB re: 1 x 10-12 Watts.

ΔPs is the difference in static pressure across the primary air valve.

Table 9: Primary Air Valve – Discharge

Unit Size	CFM	0.5" wg ΔPs						1.0" wg ΔPs						3.0" wg ΔPs					
		Octave Band Numbers						Octave Band Numbers						Octave Band Numbers					
		2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
0404	100	48	49	41	33	28	28	49	52	45	38	32	32	50	53	49	46	42	42
	150	50	52	44	37	31	31	52	57	49	41	36	36	56	61	55	50	45	45
	200	53	56	47	40	34	34	56	60	51	44	39	39	61	65	58	52	47	47
	250	57	59	50	44	37	37	60	63	54	47	41	41	65	69	61	54	49	49
0504	100	43	43	41	33	29	29	44	45	44	39	34	34	48	47	47	47	44	44
	200	47	46	43	37	32	32	50	51	47	41	37	37	55	56	54	52	47	47
	300	54	53	48	42	36	35	55	56	51	45	40	40	61	62	58	54	48	48
	350	56	55	51	45	39	38	58	58	53	48	42	42	63	64	60	56	50	50
0604 0606	200	47	44	41	33	30	29	49	49	45	39	34	34	53	54	52	50	44	44
	250	49	47	42	35	31	30	51	51	46	40	34	34	56	57	54	51	44	44
	300	52	49	44	37	31	30	54	53	48	41	35	35	58	59	55	51	45	45
	350	55	51	46	38	34	33	57	56	50	43	37	37	61	61	58	52	45	45
	450	60	56	51	43	38	37	62	59	54	46	41	40	65	65	61	54	47	47
	550	64	59	54	47	41	40	67	64	58	50	45	44	69	68	64	57	50	50
0804 0806 0811	300	49	46	43	38	33	31	53	52	48	44	38	37	58	57	58	58	49	48
	400	52	49	46	41	36	32	57	54	50	46	41	40	62	61	61	59	50	50
	500	55	51	48	43	38	35	59	56	52	47	43	41	64	63	62	60	51	51
	600	58	54	50	45	40	38	61	59	55	49	45	43	67	66	63	61	53	52
	800	63	58	53	48	43	41	66	63	58	52	48	47	70	70	66	62	56	55
	1000	67	63	58	53	47	46	70	66	61	56	51	50	73	72	69	63	59	58
1006 1011 1018	600	54	50	45	40	35	32	58	56	51	46	41	40	64	65	63	59	51	50
	800	56	52	47	41	36	34	62	59	53	49	43	41	67	67	64	60	53	52
	1000	60	56	50	46	40	37	64	61	56	51	46	44	70	69	65	61	55	53
	1200	63	58	53	49	42	40	65	63	57	53	47	45	72	71	67	63	57	55
	1400	66	61	56	52	45	43	68	65	60	55	49	47	75	73	68	64	58	57
	1600	69	64	59	55	47	46	71	67	62	57	51	49	76	74	70	65	60	58
1211 1218 1221	800	57	52	48	41	37	33	61	58	54	49	46	43	67	66	65	61	55	54
	1100	60	55	51	45	42	38	65	61	57	52	48	45	71	69	67	62	57	56
	1400	62	57	52	47	44	41	68	64	59	54	50	48	74	72	68	64	59	58
	1700	65	60	55	50	46	44	70	66	61	56	52	50	79	75	71	67	62	60
	2000	68	62	59	53	49	47	73	67	62	57	53	51	81	78	73	68	64	61
	2300	70	64	61	55	51	49	75	69	64	60	55	54	84	80	75	70	66	63
1411 1418 1421 1424	1100	60	53	49	40	35	30	65	60	55	49	46	42	72	67	64	59	56	53
	1500	62	55	51	45	41	36	69	62	57	52	48	45	76	72	68	63	59	56
	1900	64	57	53	48	43	39	72	64	59	53	49	46	79	75	71	65	61	58
	2300	67	60	56	52	46	42	74	66	61	55	51	48	83	77	72	66	62	59
	2700	70	62	59	57	50	46	75	68	63	58	53	50	87	79	74	68	63	60
	3100	73	65	61	58	53	49	77	69	64	62	55	52	90	81	75	69	64	61

Continued on next page . . .

Unit Size (Cont.)	CFM	0.5" wg ΔPs						1.0" wg ΔPs						3.0" wg ΔPs					
		Octave Band Numbers						Octave Band Numbers						Octave Band Numbers					
		2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
1621 1624	1600	62	55	51	46	43	40	66	62	57	53	50	47	74	70	67	64	61	58
	2100	66	58	54	48	45	42	71	64	60	55	52	49	77	73	70	66	63	60
	2600	70	61	55	50	48	45	75	67	62	57	54	52	81	76	72	67	65	62
	3100	72	63	57	53	50	48	79	70	64	58	56	54	85	79	74	69	67	64
	3600	73	64	59	56	52	50	82	72	65	60	57	56	88	81	76	71	68	66
	4100	74	66	62	58	55	53	83	73	67	62	59	57	93	83	77	72	69	67

Notes:

Data obtained from tests conducted in accordance with ARI Standard 880.

Sound levels are expressed in decibels, dB re: 1 x 10-12 Watts.

ΔPs is the difference in static pressure across the primary air valve.

Table 10: Unit Fan Only

Unit Size	CFM	Radiated Sound Power Data						Discharge Sound Power Data					
		Octave Band Numbers						Octave Band Numbers					
		2	3	4	5	6	7	2	3	4	5	6	7
0404 0504 0604 0804	200	63	57	52	50	44	39	53	48	47	40	36	31
	300	66	62	57	52	46	44	54	52	48	45	40	36
	400	67	64	57	52	46	45	54	53	49	50	44	40
	450	68	65	58	54	48	46	56	55	52	52	46	43
0606 0806 1006	300	62	54	52	47	43	40	51	50	48	41	38	37
	400	69	62	56	52	50	49	55	54	51	47	44	43
	500	71	65	58	56	53	52	60	59	55	52	49	49
0811 1011 1211 1411	400	64	57	50	48	45	38	54	50	50	44	41	37
	700	68	61	58	54	50	48	59	55	57	55	50	45
	1000	73	66	63	62	57	57	64	62	63	64	58	56
1018 1218 1418	800	65	58	58	53	47	45	58	53	54	51	45	44
	1100	68	61	60	57	52	51	61	56	56	54	49	49
	1400	71	65	62	61	57	56	65	60	60	59	55	56
	1800	75	70	67	65	62	62	70	68	66	68	63	64
1221 1421 1621	1200	67	63	59	55	53	51	63	57	57	55	49	49
	1600	72	67	63	61	59	58	68	62	62	61	56	56
	2000	75	70	67	66	64	63	71	67	67	68	63	64
1424 1624	1500	68	64	58	57	55	53	65	60	60	57	53	52
	1900	72	68	63	62	60	59	68	63	65	63	60	59
	2400	76	72	68	67	65	63	72	68	69	70	66	66

Notes:

Data obtained from tests conducted in accordance with ARI Standard 880.

Sound levels are expressed in decibels, dB re: 1 x 10-12 Watts.

ΔPs is the difference in static pressure across the primary air valve.

Fan Performance Data

General Fan Note

Each fan curve depicts the actual performance for the relative motor tap without any additional fan balance adjustment. Actual specified capacities which fall below a particular fan curve (LOW, MED, or HI) can be obtained by adjustment of the electronic fan speed controller. Selections should only be made in the unshaded areas. The minimum external static pressure requirement is shown for each fan assembly. The unit fan should not be energized prior to realizing this minimum external static pressure.

Terminals with electric heat (Model TVS-E) require a minimum of 0.1" wg downstream pressure.

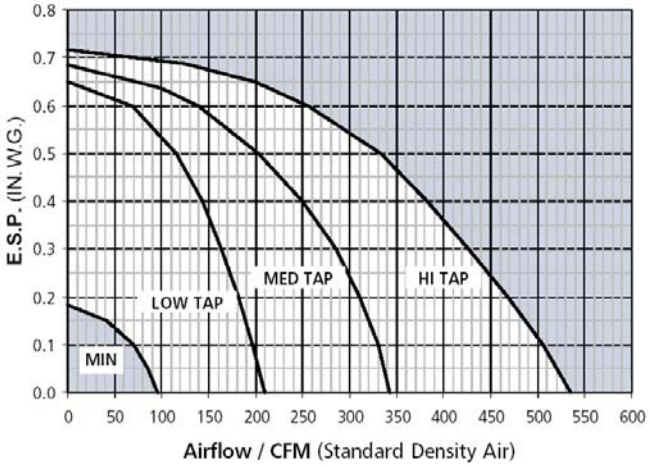

Figure 11: Unit Sizes 0404, 0504, 0604, 0804

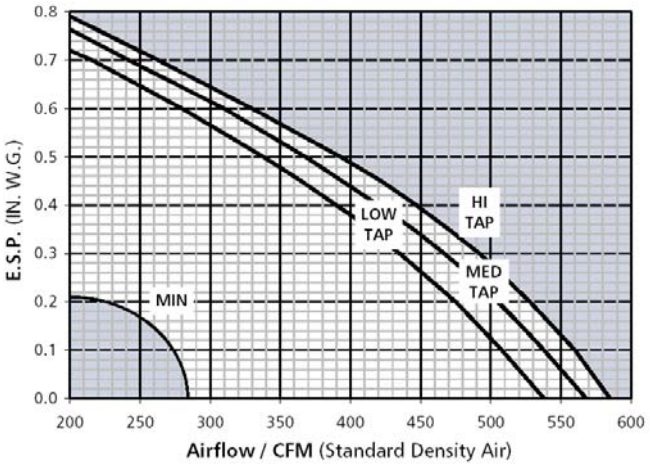

Figure 12: Unit Size 0606

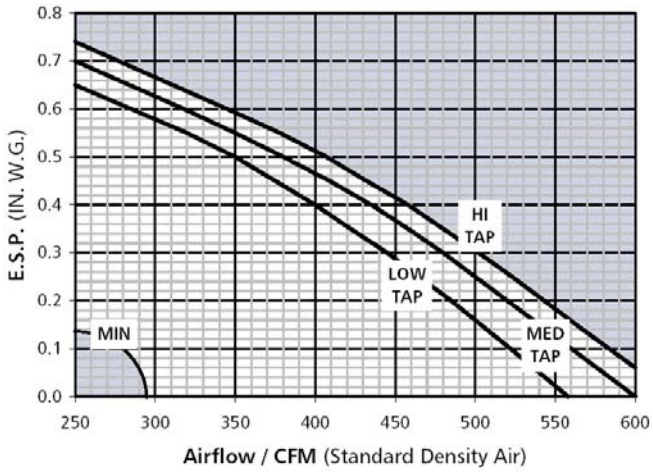

Figure 13: Unit Size 0806

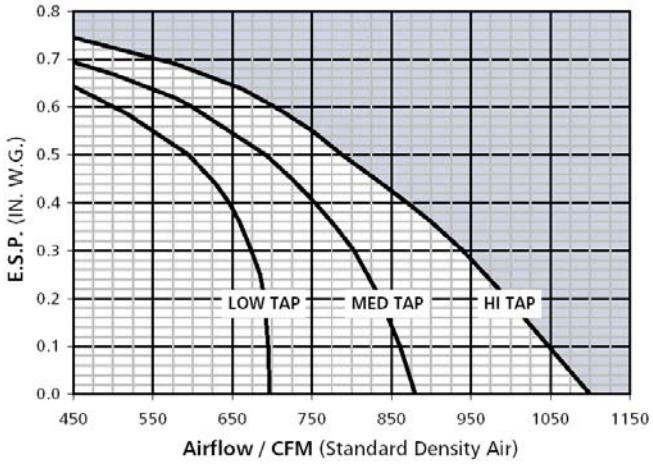

Figure 14: Unit Size 0811

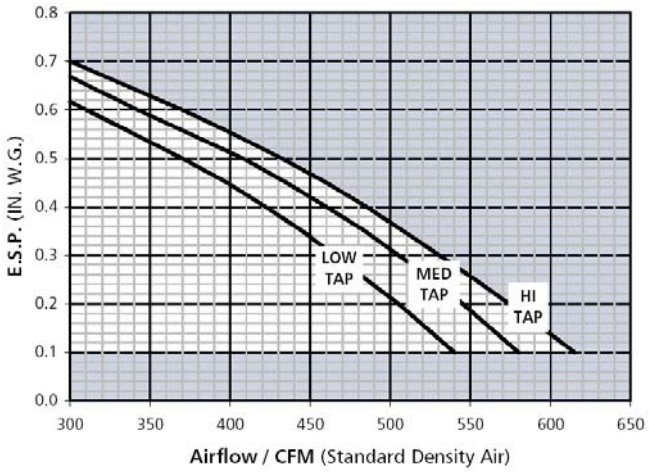

Figure 15: Unit Size 1006

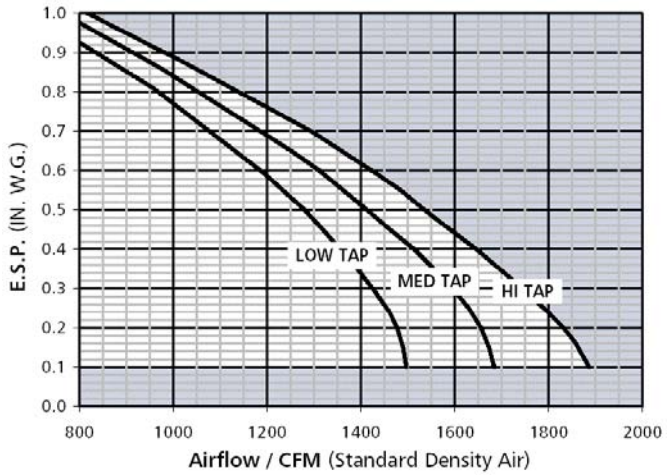

Figure 16: Unit Size 1018

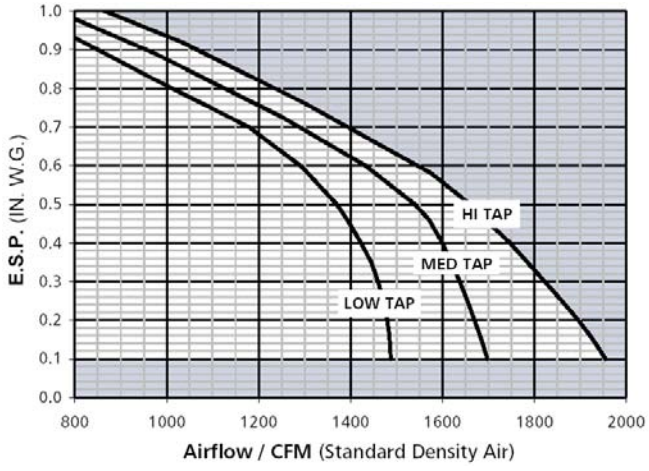

Figure 17: Unit Size 1218

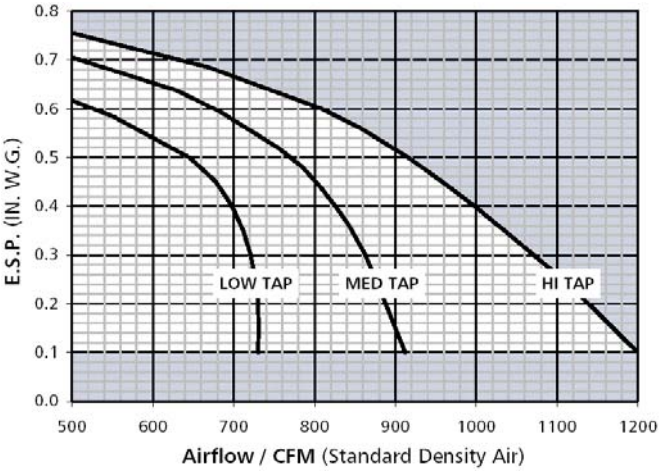

Figure 18: Unit Size 1011

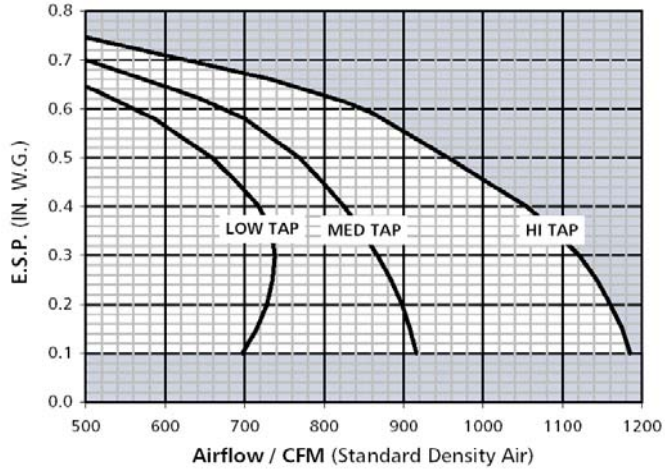

Figure 19: Unit Size 1211

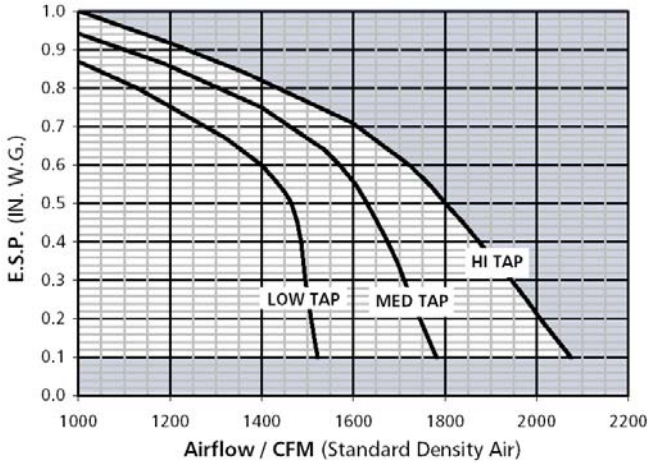

Figure 20: Unit Size 1221

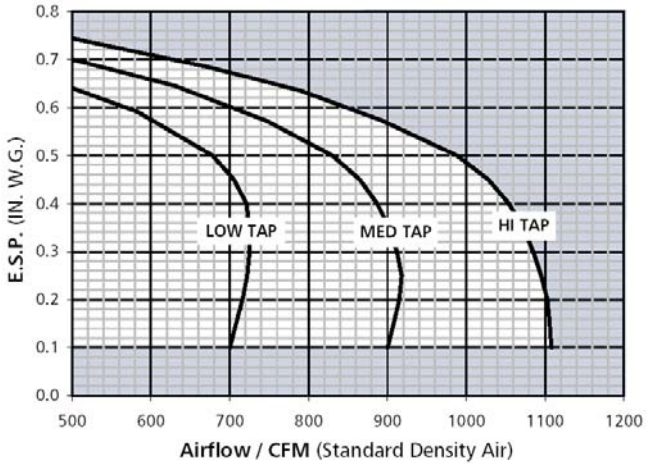

Figure 21: Unit Size 1411

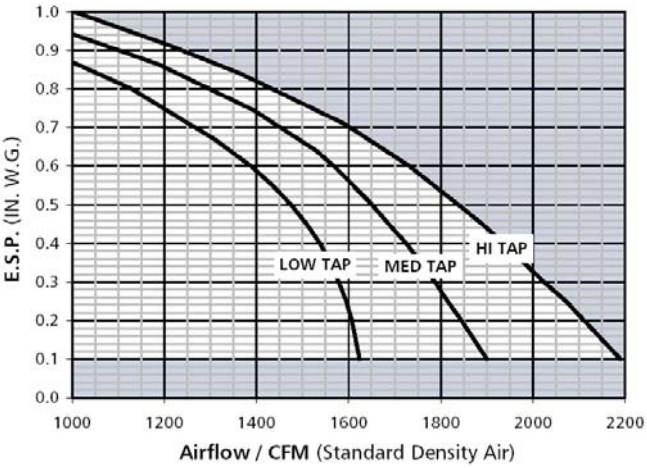

Figure 22: Unit Size 1421

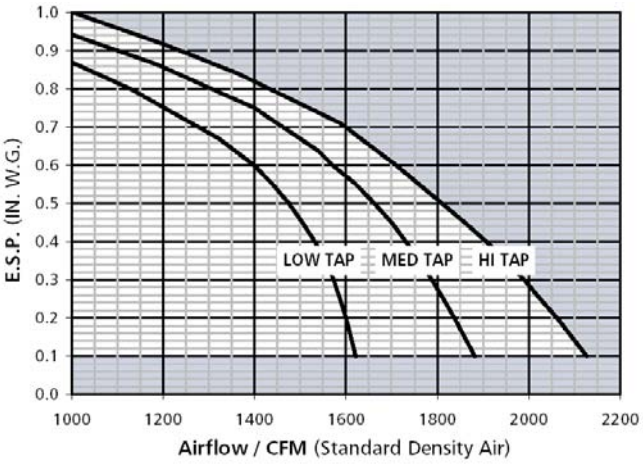

Figure 23: Unit Size 1621

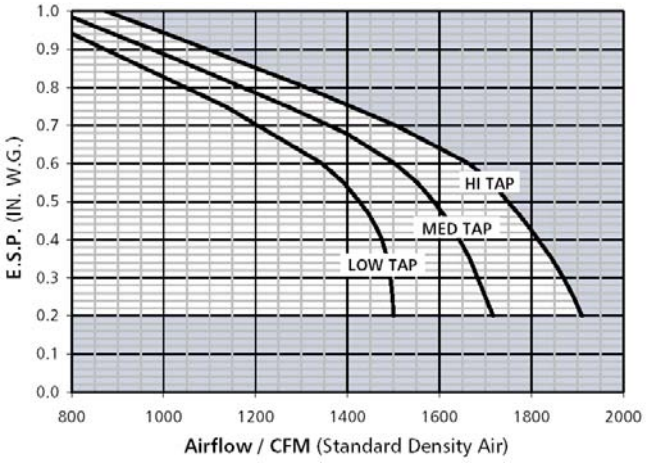

Figure 24: Unit Size 1418

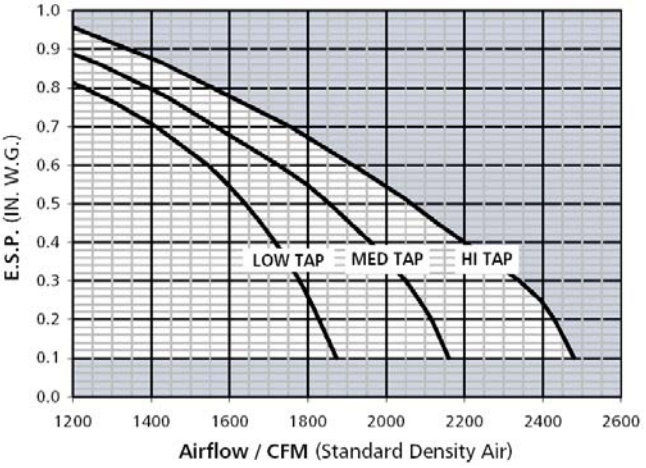

Figure 25: Unit Size 1424

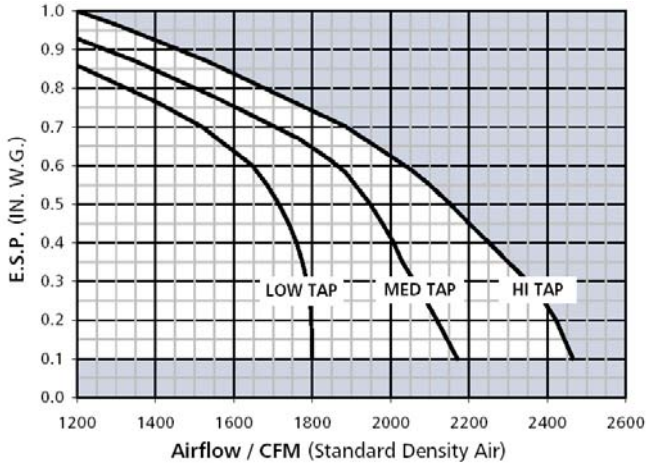

Figure 26: Unit Size 1624

ARI Ratings

Table 11: Fan Performance

Unit Size	Fan CFM	Power (Watts)	Sound Power Level, dB re: 10^{-12} Watts											
			Discharge						Radiated					
			Hz Octave Band Center Frequency						Hz Octave Band Center Frequency					
			125	250	500	1000	2000	4000	125	250	500	1000	2000	4000
0404	400	140	54	53	49	46	40	37	67	64	57	52	46	45
0504	400	140	54	53	49	46	40	37	67	64	57	52	46	45
0604	400	140	54	53	49	46	40	37	67	64	57	52	46	45
0606	510	200	60	59	56	53	50	50	72	67	60	58	55	55
0804	410	140	54	53	49	53	47	44	67	64	57	52	46	45
0806	520	220	62	61	58	56	53	53	73	67	61	58	56	55
0811	970	380	64	62	62	62	57	56	70	66	63	62	57	57
1006	540	220	62	61	58	56	53	53	73	67	61	58	56	55
1011	1100	420	66	62	63	65	59	57	73	68	63	62	59	59
1018	1800	810	70	68	66	68	63	64	75	70	67	65	62	62
1211	1125	440	66	63	64	65	59	57	76	68	63	62	59	59
1218	1850	840	70	68	66	68	63	64	76	70	67	66	63	63
1221	1950	840	71	67	66	67	63	64	75	70	67	65	63	62
1411	1075	450	66	62	64	65	59	57	76	68	63	62	59	59
1418	1900	880	71	68	66	68	63	64	76	70	67	66	63	63
1421	2050	920	72	67	68	69	63	64	76	71	68	67	65	64
1424	2400	1000	72	68	69	70	66	66	76	72	68	67	65	63
1621	2050	950	72	67	68	69	63	64	76	71	68	67	65	64
1624	2400	1000	72	68	69	70	66	66	76	72	68	67	65	63

Note: Fan external static pressure is 0.25” wg. Rated in accordance with ARI Standard 880.

Table 12: Primary Air Valve Performance

Unit Size	Primary CFM	Minimum Operating Pressure (In. Water)	Sound Power Level, dB re: 10^{-12} Watts											
			Discharge						Radiated					
			Hz Octave Band Center Frequency						Hz Octave Band Center Frequency					
			125	250	500	1000	2000	4000	125	250	500	1000	2000	4000
0404	150	0.01	54	59	51	44	39	40	58	51	44	35	32	31
0504	250	0.02	55	56	52	47	42	43	59	49	46	37	32	32
0604	400	0.12	61	60	54	47	42	42	62	54	50	42	36	31
0606	400	0.12	61	60	54	47	42	42	62	54	50	42	36	31
0804	700	0.13	66	64	60	54	50	48	66	58	52	45	40	33
0806	700	0.13	66	64	60	54	50	48	66	58	52	45	40	33
0811	700	0.13	66	64	60	54	50	48	66	58	52	45	40	33
1006	1100	0.02	67	65	60	55	50	48	68	60	54	46	40	38
1011	1100	0.02	67	65	60	55	50	48	68	60	54	46	40	38
1018	1100	0.02	67	65	60	55	50	48	68	60	54	46	40	38
1211	1600	0.06	72	68	64	60	55	53	71	63	56	48	41	37
1218	1600	0.06	72	68	64	60	55	53	71	63	56	48	41	37
1221	1600	0.06	72	68	64	60	55	53	71	63	56	48	41	37
1411	2100	0.08	76	69	64	58	54	51	73	61	54	46	40	38
1418	2100	0.08	76	69	64	58	54	51	73	61	54	46	40	38
1421	2100	0.08	76	69	64	58	54	51	73	61	54	46	40	38
1424	2100	0.08	76	69	64	58	54	51	73	61	54	46	40	38
1621	2800	0.04	79	72	67	61	60	59	77	68	61	52	44	40
1624	2800	0.04	79	72	67	61	60	59	77	68	61	52	44	40

Note: Inlet static pressure is 1.5” wg. Rated in accordance with ARI Standard 880.

Model TVS-W Performance Data

Table 13: Model TVS-W Hot Water Coil Performance Data (Unit Sizes 0404, 0504, 0604, 0804, 0806, and 0811)

Airflow		Water Flow			LAT (°F)		LWT (°F)		Capacity (MBH)	
Rate (CFM)	Air PD (in. wg)	Rate (GPM)	Water PD (ft. wg)							
			1 Row	2 Row	1 Row	2 Row	1 Row	2 Row	1 Row	2 Row
200	1 Row 0.01 2 Row 0.01	0.5	0.3	0.1	114.5	129.2	136.1	123.2	10.74	13.92
		1	1.2	--	122.6	--	154.4	--	12.5	--
		2	4.1	--	127.7	--	166	--	13.6	--
		3	8.6	--	129.6	--	170.4	--	14.02	--
		5	--	--	--	--	--	--	--	--
300	1 Row 0.01 2 Row 0.02	0.5	0.3	0.1	104.4	116	127.8	112.5	12.81	16.6
		1	1.2	0.3	112.7	130.7	148.2	136.3	15.51	21.37
		2	5.9	--	129.2	--	158.6	--	20.89	--
		3	8.7	--	120.3	--	167.7	--	17.99	--
		5	22	--	122.2	--	172.4	--	18.59	--
400	1 Row 0.02 2 Row 0.03	0.5	0.3	0.1	97.9	107.2	122.1	105.7	14.25	18.32
		1	1.2	0.3	106.1	121.8	143.6	129.7	17.81	24.65
		2	4.2	--	111.7	--	159.2	--	20.25	--
		3	8.7	--	113.9	--	165.5	--	21.22	--
		5	22	--	115.9	--	170.9	--	22.07	--
500	1 Row 0.02 2 Row 0.05	0.5	0.3	--	93.2	--	117.9	--	15.31	--
		1	1.2	0.3	101.2	115.2	139.9	124.6	19.64	27.19
		2	4.2	1.2	106.9	126.5	156.7	145.9	22.71	33.33
		3	8.7	--	109.2	--	163.6	--	23.96	--
		5	22.1	--	111.2	--	169.7	--	25.06	--
600	1 Row 0.03 2 Row 0.07	0.5	0.4	--	89.8	--	114.8	--	16.12	--
		1	1.2	0.3	97.5	109.9	136.9	120.6	21.16	29.21
		2	4.2	1.2	103.2	121.3	154.6	142.5	24.83	36.62
		3	8.7	2.5	105.5	126.3	162	152.8	26.34	39.88
		5	22.1	--	107.6	--	168.6	--	27.69	--
700	1 Row 0.04 2 Row 0.09	0.5	0.4	--	87	--	112.5	--	16.73	--
		1	1.2	0.3	94.6	105.7	134.3	117.3	22.44	30.86
		2	4.2	1.2	100.2	117	152.7	139.7	26.68	39.45
		3	8.7	2.5	102.5	122.1	160.6	150.4	28.45	43.32
		5	22.1	6.2	104.6	126.9	167.7	160.7	30.05	46.97

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Airflow (Cont.)		Water Flow			LAT (°F)		LWT (°F)		Capacity (MBH)	
Rate (CFM)	Air PD (in. wg)	Rate (GPM)	Water PD (ft. wg)							
			1 Row	2 Row	1 Row	2 Row	1 Row	2 Row	1 Row	2 Row
800	1 Row 0.06 2 Row 0.11	0.5	0.4	--	84.8	--	110.7	--	17.21	--
		1	1.2	0.3	92.1	102.1	132.2	114.7	23.53	32.21
		2	4.2	1.2	97.7	113.3	151	137.2	28.33	41.92
		3	8.8	2.5	100	118.5	159.3	148.3	30.34	46.38
		5	22.1	6.2	102.1	123.4	166.8	159.2	32.18	50.64

Notes:

Data is based on 180°F entering water and 55°F entering air at sea level.

For optimum diffuser performance in overhead heating applications, the supply air temperature should be within 20°F of the desired space temperature. This typically requires a higher air capacity, which provides higher air motion in the space, increasing thermal comfort. The hot water coil should be selected with this in mind, keeping the Leaving Air Temperature (LAT) as low as possible.

Table 14: Model TVS-W Hot Water Coil Performance Data (Unit Sizes 1006, 1018, 1218, and 1221)

Airflow		Water Flow			LAT (°F)		LWT (°F)		Capacity (MBH)	
Rate (CFM)	Air PD (in. wg)	Rate (GPM)	Water PD (ft. wg)							
			1 Row	2 Row	1 Row	2 Row	1 Row	2 Row	1 Row	2 Row
400	1 Row 0.01 2 Row 0.02	0.5	0.4	0.1	102.6	111.7	113.7	97.9	16.33	20.24
		1	1.5	0.4	112.5	128.3	137.8	124	20.62	27.44
		2	5.2	--	119.3	--	155.8	--	23.56	--
		3	10.9	--	122	--	163.1	--	24.73	--
		5	27.6	--	124.4	--	169.4	--	25.74	--
600	1 Row 0.02 2 Row 0.03	0.5	0.5	--	93.5	--	105	--	18.56	--
		1	1.5	0.4	103	115.6	129.6	113.1	24.72	32.9
		2	5.3	1.5	109.9	128.8	150.1	137.6	29.25	41.49
		3	11	--	112.8	--	158.7	--	31.1	--
		5	27.7	--	115.3	--	166.5	--	32.75	--
800	1 Row 0.03 2 Row 0.05	0.5	0.5	--	87.9	--	99.9	--	19.91	--
		1	1.6	0.4	96.9	107.1	123.8	106	27.64	36.51
		2	5.3	1.5	103.8	120.3	145.6	131	33.62	47.98
		3	11	3.1	106.7	126.4	155.3	143.7	36.14	53.24
		5	27.8	--	109.3	--	164.2	--	38.42	--
1000	1 Row 0.04 2 Row 0.08	0.5	0.5	--	84.1	--	96.9	--	20.73	--
		1	1.6	0.5	92.5	101	119.5	101.1	29.84	39.05
		2	5.4	1.5	99.3	113.9	142.1	125.9	37.15	53.05
		3	11.1	3.2	102.2	120.1	152.5	139.3	40.31	59.73
		5	27.9	7.9	104.8	126.1	162.3	152.8	43.21	66.22
1200	1 Row 0.05 2 Row 0.11	0.5	--	--	--	--	--	--	--	--
		1	1.6	0.5	89.3	96.4	116.2	97.6	31.55	40.88
		2	5.4	1.5	95.8	108.9	139.1	121.9	40.11	57.15
		3	11.1	3.2	98.7	115.1	150.1	135.6	43.87	65.17
		5	27.9	7.9	101.4	121.2	160.6	150.1	47.36	73.11
1400	1 Row 0.07 2 Row 0.14	0.5	--	--	--	--	--	--	--	--
		1	1.6	0.5	86.7	92.8	113.6	95.1	32.92	42.21
		2	5.4	1.6	93.1	104.9	136.6	118.5	42.62	60.54
		3	11.2	3.2	95.9	111	148	132.6	46.96	69.81
		5	28	8	98.6	117.1	159.1	147.6	51.03	78.14
1600	1 Row 0.09 2 Row 0.18	0.5	--	--	--	--	--	--	--	--
		1	1.6	0.5	84.6	89.9	111.6	93.4	34.01	43.18
		2	5.5	1.6	90.8	101.5	134.5	115.8	44.81	63.37
		3	11.3	3.2	93.6	107.5	146.2	129.9	49.7	73.82
		5	28.1	8	96.3	113.7	157.8	145.4	54.32	84.49

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Airflow (Cont.)		Water Flow			LAT (°F)		LWT (°F)		Capacity (MBH)	
Rate (CFM)	Air PD (in. wg)	Rate (GPM)	Water PD (ft. wg)							
			1 Row	2 Row	1 Row	2 Row	1 Row	2 Row	1 Row	2 Row
1800	1 Row 0.11 2 Row 0.23	0.5	--	--	--	--	--	--	--	--
		1	1.7	0.5	82.9	87.5	109.9	92.2	34.88	43.86
		2	5.5	1.6	88.9	98.7	132.6	113.4	46.72	65.78
		3	11.3	3.2	91.7	104.6	144.6	127.6	52.14	77.33
		5	28.2	8	94.4	110.7	156.6	143.5	57.3	89.29

Notes:

Data is based on 180°F entering water and 55°F entering air at sea level.

For optimum diffuser performance in overhead heating applications, the supply air temperature should be within 20°F of the desired space temperature. This typically requires a higher air capacity, which provides higher air motion in the space, increasing thermal comfort. The hot water coil should be selected with this in mind, keeping the LAT as low as possible.

Table 15: Model TVS-W Hot Water Coil Performance Data (Unit Sizes 1411, 1418, 1421, 1424, 1621, and 1624)

Airflow		Water Flow			LAT (°F)		LWT (°F)		Capacity (MBH)	
Rate (CFM)	Air PD (in. wg)	Rate (GPM)	Water PD (ft. wg)							
			1 Row	2 Row	1 Row	2 Row	1 Row	2 Row	1 Row	2 Row
1000	1 Row 0.03 2 Row 0.06	0.5	0.6	--	85	--	93	--	21.69	--
		1	1.8	0.5	94	102.4	116.3	98	31.45	40.59
		2	6	1.7	101.3	116.1	139.8	123.5	39.38	55.45
		3	12.4	3.6	104.5	122.7	150.8	137.4	42.81	62.55
		5	31.2	8.9	107.4	129	161.1	151.5	45.96	69.45
1200	1 Row 0.04 2 Row 0.08	0.5	--	--	--	--	--	--	--	--
		1	1.8	0.5	90.6	97.7	112.7	94.3	33.28	42.53
		2	6.1	1.7	97.7	111	136.6	119.2	42.56	59.82
		3	12.5	3.6	100.9	117.6	148.2	133.5	46.66	68.38
		5	31.3	8.9	103.8	124.1	159.3	148.5	50.47	76.86
1400	1 Row 0.05 2 Row 0.11	0.5	--	--	--	--	--	--	--	--
		1	1.8	0.5	87.9	94	109.9	91.6	34.74	43.96
		2	6.1	1.8	94.8	106.8	133.9	115.6	45.27	63.44
		3	12.6	3.6	97.9	113.3	146	130.1	50.01	73.36
		5	31.4	8.9	100.9	119.9	157.7	145.9	54.47	83.36
1600	1 Row 0.07 2 Row 0.14	0.5	--	--	--	--	--	--	--	--
		1	1.6	0.5	84.6	90.9	111.6	89.7	34.01	45
		2	6.2	1.8	92.5	103.3	131.6	112.6	47.63	66.47
		3	12.6	3.6	95.5	109.8	144	127.3	52.98	77.67
		5	31.5	9	98.5	116.4	156.2	143.5	58.05	89.15
1800	1 Row 0.09 2 Row 0.17	0.5	--	--	--	--	--	--	--	--
		1	1.9	0.6	83.9	88.4	106	88.4	36.85	45.75
		2	6.2	1.8	90.5	100.4	129.6	110.1	49.69	69.04
		3	12.7	3.6	93.5	106.7	142.2	124.8	55.63	81.45
		5	31.6	9	96.4	113.3	154.9	141.4	61.31	94.34
2000	1 Row 0.10 2 Row 0.21	0.5	--	--	--	--	--	--	--	--
		1	1.9	--	82.3	--	104.6	--	37.61	--
		2	6.3	1.8	88.8	97.9	127.8	108	51.52	71.25
		3	12.8	3.7	91.8	104.1	140.6	122.6	58.02	84.78
		5	31.7	9	94.6	110.7	153.7	139.6	64.28	99.04
2200	1 Row 0.12 2 Row 0.25	0.5	--	--	--	--	--	--	--	--
		1	2	--	81	--	103.5	--	38.21	--
		2	6.3	1.8	87.3	95.7	126.2	106.2	53.15	73.15
		3	12.8	3.7	90.2	101.8	139.2	120.6	60.2	87.76
		5	31.8	9.1	93.1	108.3	152.6	137.8	67.02	103.32

Notes:

Data is based on 180°F entering water and 55°F entering air at sea level.

For optimum diffuser performance in overhead heating applications, the supply air temperature should be within 20°F of the desired space temperature. This typically requires a higher air capacity, which provides higher air motion in the space, increasing thermal comfort. The hot water coil should be selected with this in mind, keeping the LAT as low as possible.

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