

# EFFICIENT SILENT ARRAY™

Advanced Direct Drive Plenum Fans Catalog

## TECHNICAL SPECIFICATIONS



PENNBARRY™

BULLETIN ESA18

# TABLE OF CONTENTS

INTRODUCTION	3
CERTIFICATIONS & LISTINGS	4
DIMENSIONS	5
PERFORMANCE DATA	6-15
SOUND PERFORMANCE	16-29

# INTRODUCTION

## Efficient Silent Array ESA

The PennBarry Efficient Silent Array is a direct drive plenum fan with the flexibility to be used singularly or in parallel so you can construct a multiple fan system to meet the exact performance criteria for your application.

## The ESA Advantage

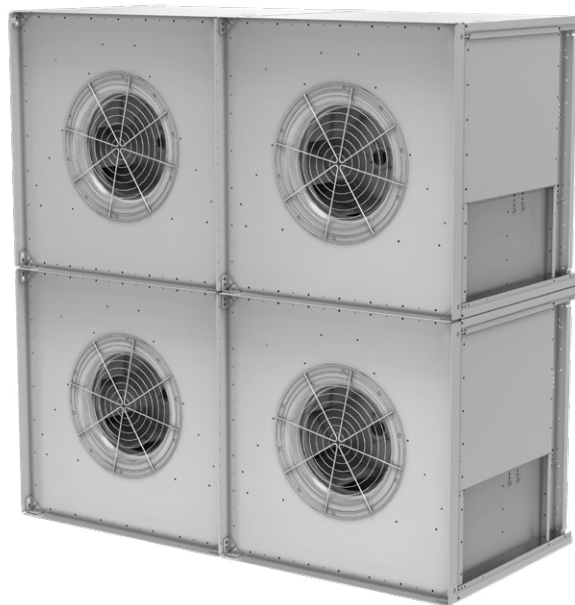
- Fan redundancy ensures the system continues to perform, even with a fan in the array shut off
- Stackable, individual units allow flexibility to meet any design criteria
- Direct drive premium NEMA motor eliminates bearings, belts, and pulleys, reducing maintenance costs significantly
- Motor base optimization eliminates unnecessary, wasteful, and costly materials
- Eliminates all resonance conditions
- PennBarry's proprietary balance process improves on currently accepted AMCA specifications by considering the effects of the rotating mass on the units as a whole, not just the wheel
- Modular units fit through standard door openings for retrofit applications
- Sound panels enclose the fan and motor to reduce attenuation levels

## Applications Systems

- High performance VAV systems
- Air Handlers
- Rooftop units
- General supply and return exhaust
- Telecom data centers
- Clean rooms

## ESA Features

- Available sizes: 10" through 40"
- 9 or 12 blade, aluminum airfoil wheel
- G90 mechanically fastened frame
- Performance: up to 10 in-wg and 76% efficiency



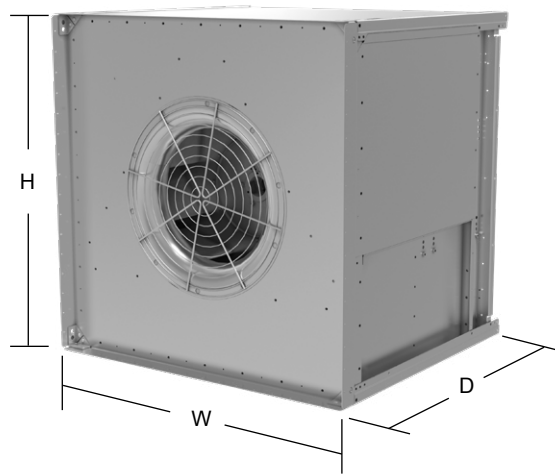
# CERTIFICATIONS & LISTINGS



## AMCA Certification

PennBarry certifies that the Efficient Silent Array models shown herein are licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA publication 211 and AMCA publication 311 and comply with the requirements of the AMCA Certified Ratings Program.

# DIMENSIONS



Efficient Silent Array™ Dimensional Data					
Wheel Size	Housing Dimensions			Max Stacked Cubes **	Max Motor Frame Size
	Width (W)	Height (H)	Depth (D)*		
10	20.03	18.79	24.56	4	184T
12	22.66	20.89	25.81	4	184T
13	24.53	22.4	28.06	4	213T
15	26.78	24.2	30.63	3	215T
16	29.03	25.75	35.31	3	254T
18	30.41	30	36.77	3	256T
20	33.75	34	37.85	3	284T
22	37.41	37.1	39.19	2	284T
25	41.43	41	40.57	2	284T
27	44.88	44.88	39.76	2	286T
30	49.25	49.25	44.56	2	326T
33	53.75	53.75	46.91	2	326T
36	59.38	59.38	50.52	2	405T
40	64.75	64.75	51.85	1	405T

\* Cabinet dimension only. Overall length including motor will vary based on motor type, size, and manufacturer.

\*\*Recommended max stacked cubes based on max hp. Higher stacks are possibly with smaller hp-contact PennBarry engineering.

# PERFORMANCE DATA

## ESA | 105-9-100 1X1

Tip Speed, FPM = 2.75 x RPM Maximum RPM = 5625												MAX HP = 0.025 x (RPM/ 1000) <sup>3</sup>													
CFM	OV	0.5" S.P.		1" S.P.		1.5" S.P.		2" S.P.		3" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		10" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
400	533	1284	0.05	1694	0.11																				
600	800	1518	0.09	1847	0.16	2138	0.24	2415	0.33																
800	1067	1786	0.13	2084	0.23	2336	0.32	2567	0.42	2995	0.64	3389	0.89												
1000	1333			2346	0.31	2578	0.43	2787	0.55	3163	0.79	3510	1.06	3848	1.35	4162	1.65								
1200	1600			2622	0.42	2840	0.56	3035	0.69	3384	0.98	3695	1.27	3999	1.59	4276	1.91	4562	2.26	4831	2.62	5083	2.99		
1400	1867					3114	0.71	3299	0.87	3628	1.19	3924	1.52	4196	1.86	4460	2.22	4714	2.59	4951	2.97	5195	3.37	5433	3.79
1600	2133					3398	0.90	3572	1.07	3888	1.44	4168	1.81	4428	2.19	4673	2.57	4901	2.97	5135	3.39	5356	3.81	5567	4.24
1800	2400							3854	1.32	4156	1.72	4426	2.13	4674	2.55	4907	2.97	5130	3.40	5341	3.84	5542	4.30		
2000	2667									4431	2.04	4692	2.49	4933	2.95	5156	3.41	5366	3.88	5573	4.36				
2200	2933									4714	2.41	4965	2.90	5198	3.40	5415	3.90	5620	4.40						
2400	3200											5244	3.36	5469	3.89										
2600	3467											5530	3.88												

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 105-12-100 1x1

Tip Speed, FPM = 2.75 x RPM Maximum RPM = 5625												MAX HP = 0.024 x (RPM/ 1000) <sup>3</sup>													
CFM	OV	0.5" S.P.		1" S.P.		1.5" S.P.		2" S.P.		3" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		10" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
600	800	1572	0.09	1895	0.16	2186	0.25	2461	0.33	2961	0.53														
750	1000	1798	0.13	2085	0.22	2337	0.31	2577	0.41	3025	0.63	3435	0.86												
900	1200			2299	0.28	2528	0.38	2738	0.50	3138	0.73	3515	0.99	3860	1.27	4202	1.56	4518	1.86						
1050	1400			2527	0.36	2738	0.48	2934	0.60	3294	0.86	3634	1.14	3960	1.44	4271	1.75	4561	2.08	4855	2.41	5132	2.76		
1200	1600					2963	0.59	3143	0.72	3480	1.01	3790	1.31	4090	1.63	4371	1.96	4657	2.32	4923	2.68	5175	3.05	5436	3.43
1350	1800					3196	0.73	3367	0.87	3679	1.18	3972	1.50	4246	1.84	4517	2.20	4767	2.57	5023	2.96	5273	3.35	5510	3.76
1500	2000							3597	1.04	3894	1.37	4169	1.72	4428	2.08	4674	2.46	4922	2.86	5155	3.26	5375	3.68	5610	4.11
1650	2200									4119	1.60	4376	1.97	4625	2.35	4860	2.75	5080	3.17	5310	3.60	5528	4.04		
1800	2400									4348	1.85	4598	2.24	4828	2.65	5057	3.08	5272	3.51	5476	3.96				
1950	2600									4585	2.13	4824	2.55	5048	2.99	5258	3.43	5470	3.89						
2100	2800											5054	2.90	5272	3.35	5476	3.82								
2250	3000											5292	3.28	5499	3.76										

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 122-9-100 1X1

Tip Speed, FPM = 3.21 x RPM Maximum RPM = 3300												MAX HP = 0.462 x (RPM/ 1000) <sup>3</sup>													
CFM	OV	0.5" S.P.		1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1000	980	1423	0.15	1670	0.27	1899	0.39	2120	0.53	2342	0.68	2545	0.84												
1200	1176	1603	0.21	1827	0.34	2027	0.48	2215	0.62	2409	0.79	2589	0.95	2949	1.33	3281	1.73								
1400	1373	1790	0.28	2000	0.43	2179	0.58	2351	0.74	2513	0.91	2679	1.09	2993	1.48	3310	1.91	3598	2.36						
1600	1569			2179	0.53	2349	0.70	2503	0.88	2653	1.06	2799	1.26	3086	1.67	3361	2.11	3640	2.58	3904	3.08	4154	3.61		
1800	1765			2363	0.66	2525	0.85	2672	1.04	2807	1.24	2940	1.45	3199	1.88	3455	2.34	3704	2.84	3947	3.35	4193	3.91	4424	4.47
2000	1961			2550	0.80	2705	1.01	2845	1.22	2976	1.44	3099	1.66	3339	2.12	3568	2.61	3799	3.13	4027	3.67	4240	4.22	4467	4.82
2200	2157					2890	1.20	3024	1.43	3150	1.67	3268	1.90	3487	2.39	3708	2.91	3915	3.45	4122	4.01	4334	4.60		
2400	2353					3078	1.42	3207	1.67	3327	1.92	3441	2.18	3655	2.70	3851	3.24	4055	3.81	4245	4.39	4430	5.00		
2600	2549							3392	1.93	3509	2.20	3619	2.48	3825	3.04	4016	3.61	4198	4.20	4385	4.81				
2800	2745							3581	2.23	3693	2.52	3800	2.81	3999	3.41	4185	4.01	4359	4.63						
3000	2941									3880	2.87	3983	3.18	4177	3.81	4357	4.45								
3200	3137									4067	3.25	4170	3.58	4357	4.25										

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

# PERFORMANCE DATA

## ESA | 122-12-100 1x1

Tip Speed, FPM = 3.21 x RPM Maximum RPM = 4470	MAX HP = 0.055 x (RPM/ 1000) <sup>3</sup>
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CFM	OV	0.5" S.P.		1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1000	980	1462	0.16	1702	0.27	1923	0.39	2139	0.53	2346	0.67	2552	0.82												
1200	1176	1651	0.22	1872	0.35	2065	0.48	2249	0.63	2428	0.78	2610	0.95	2955	1.30										
1400	1373	1837	0.30	2054	0.45	2231	0.60	2395	0.75	2550	0.92	2711	1.10	3020	1.47	3315	1.88	3606	2.31						
1600	1569			2242	0.57	2410	0.73	2561	0.91	2706	1.09	2844	1.27	3121	1.67	3390	2.10	3654	2.55	3912	3.03	4160	3.53		
1800	1765			2431	0.70	2595	0.89	2740	1.08	2873	1.28	3001	1.48	3248	1.90	3496	2.35	3732	2.82	3974	3.33	4201	3.85	4433	4.40
2000	1961			2617	0.86	2784	1.08	2923	1.29	3052	1.50	3172	1.72	3404	2.16	3622	2.63	3847	3.13	4058	3.65	4278	4.20	4490	
2200	2157			2807	1.04	2973	1.29	3111	1.52	3235	1.75	3352	1.99	3567	2.46	3777	2.96	3974	3.48	4179	4.02	4376	4.59	4568	
2400	2353					3159	1.52	3302	1.78	3421	2.03	3535	2.29	3744	2.80	3936	3.33	4130	3.87	4311	4.43				
2600	2549					3347	1.78	3488	2.07	3611	2.35	3721	2.62	3924	3.17	4111	3.73	4288	4.30	4466	4.89				
2800	2745							3674	2.38	3801	2.69	3910	2.99	4108	3.58	4291	4.18	4461	4.78						
3000	2941							3863	2.73	3986	3.07	4102	3.40	4294	4.03										
3200	3137									4173	3.47	4286	3.83												

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 135-9-100 1X1

Tip Speed, FPM = 3.53 x RPM Maximum RPM = 4310	MAX HP = 0.093 x (RPM/ 1000) <sup>3</sup>
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CFM	OV	0.5" S.P.		1" S.P.		1.5" S.P.		2" S.P.		3" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		10" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	1225	1471	0.26	1670	0.41	1850	0.58	2008	0.76	2343	1.15	2652	1.59												
1750	1430			1831	0.52	1993	0.71	2146	0.90	2428	1.32	2711	1.79	2969	2.28	3245	2.83								
2000	1634			1998	0.65	2149	0.86	2290	1.07	2548	1.52	2796	2.02	3046	2.54	3272	3.09	3510	3.69	3746	4.32				
2250	1838			2170	0.81	2313	1.03	2444	1.27	2689	1.76	2909	2.28	3131	2.83	3356	3.42	3565	4.03	3759	4.66	3979	5.35	4188	6.06
2500	2042					2482	1.24	2606	1.49	2834	2.03	3049	2.58	3244	3.16	3442	3.78	3649	4.43	3842	5.09	4025	5.78	4200	6.49
2750	2247					2653	1.47	2773	1.75	2989	2.32	3192	2.92	3384	3.54	3560	4.18	3735	4.85	3927	5.55	4109	6.28	4281	7.02
3000	2451							2943	2.04	3152	2.65	3340	3.29	3526	3.95	3700	4.62	3862	5.32	4015	6.04	4194	6.80		
3250	2655									3317	3.02	3500	3.70	3672	4.40	3842	5.11	4001	5.84	4152	6.60	4296	7.38		
3500	2859									3485	3.43	3663	4.15	3827	4.89	3987	5.65	4144	6.42	4292	7.21				
3750	3064									3656	3.89	3828	4.64	3988	5.42	4139	6.23	4288	7.04						
4000	3268											3996	5.19	4152	6.01	4299	6.85								
4250	3472											4167	5.79												

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 135-12-100 1X1

Tip Speed, FPM = 3.53 x RPM Maximum RPM = 4310	MAX HP = 0.097 x (RPM/ 1000) <sup>3</sup>
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CFM	OV	0.5" S.P.		1" S.P.		1.5" S.P.		2" S.P.		3" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		10" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	1225	1442	0.25	1635	0.41	1817	0.58	1981	0.75	2334	1.16														
1750	1430	1618	0.34			1793	0.51	1948	0.70	2107	0.90	2394	1.32	2700	1.80	2976	2.32								
2000	1634			1958	0.64	2105	0.85	2237	1.06	2507	1.52	2760	2.02	3029	2.57	3273	3.14	3519	3.75						
2250	1838			2129	0.80	2266	1.02	2393	1.25	2635	1.75	2865	2.27	3089	2.84	3332	3.45	3556	4.08	3765	4.74	3765	4.74		
2500	2042			2307	0.99	2431	1.22	2553	1.47	2771	2.00	2992	2.56	3196	3.15	3392	3.77	3616	4.45	3824	5.14	3824	5.14	4209	6.59
2750	2247					2603	1.46	2716	1.73	2927	2.29	3123	2.89	3322	3.51	3506	4.16	3678	4.84	3884	5.57	3884	5.57	4265	7.10
3000	2451					2781	1.74	2884	2.02	3086	2.62	3269	3.25	3452	3.91	3633	4.60	3802	5.30	3961	6.03	3961	6.03		
3250	2655							3058	2.35	3249	2.98	3427	3.66	3591	4.35	3762	5.07	3929	5.81	4086	6.58	4086	6.58		
3500	2859							3237	2.73	3415	3.39	3587	4.10	3747	4.83	3896	5.59	4058	6.36	4214	7.17	4214	7.17		
3750	3064									3583	3.85	3750	4.59	3905	5.36	4052	6.15	4190	6.96						
4000	3268									3760	4.37	3915	5.13	4067	5.94	4209	6.76								
4250	3472											3938	4.93	4083	5.72	4230	6.56								

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

# PERFORMANCE DATA

## ESA | 150-9-100 1x1

Tip Speed, FPM = 3.93 x RPM Maximum RPM = 3920													MAX HP = 0.157 x (RPM/ 1000) <sup>3</sup>										
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CFM	OV	0.5" S.P.		1" S.P.		1.5" S.P.		2" S.P.		3" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		10" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2000	1307	1375	0.34	1542	0.54	1692	0.75	1839	0.98	2132	1.49	2417	2.05												
2250	1471	1502	0.43	1661	0.65	1799	0.87	1929	1.12	2189	1.65	2451	2.24	2703	2.88										
2500	1634			1782	0.77	1912	1.02	2035	1.28	2269	1.83	2496	2.44	2738	3.11	2963	3.82								
2750	1797			1906	0.91	2031	1.18	2144	1.46	2360	2.05	2576	2.68	2782	3.37	3001	4.11	3203	4.87	3415	5.70				
3000	1961			2031	1.07	2153	1.37	2261	1.66	2466	2.28	2657	2.95	2856	3.66	3045	4.41	3247	5.22	3435	6.05	3626	6.93		
3250	2124			2158	1.25	2276	1.57	2381	1.89	2574	2.55	2757	3.24	2937	3.98	3117	4.76	3291	5.57	3478	6.44	3655	7.34	3826	8.26
3500	2288					2400	1.80	2503	2.14	2687	2.84	2863	3.56	3026	4.33	3197	5.13	3363	5.97	3522	6.84	3699	7.78	3866	8.74
3750	2451					2526	2.05	2627	2.42	2806	3.15	2971	3.92	3131	4.71	3280	5.54	3444	6.41	3598	7.31	3744	8.24	3909	9.23
4000	2614					2653	2.33	2751	2.72	2926	3.49	3083	4.30	3238	5.13	3384	5.99	3526	6.88	3679	7.82	3823	8.77		
4250	2778							2876	3.04	3048	3.87	3201	4.71	3347	5.58	3491	6.48	3626	7.40	3760	8.35	3904	9.34		
4500	2941							3003	3.40	3171	4.28	3321	5.15	3461	6.07	3599	7.00	3732	7.95	3858	8.93				
4750	3105									3295	4.71	3442	5.63	3579	6.58	3708	7.55	3839	8.54						

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 150-12-100 1x1

Tip Speed, FPM = 3.93 x RPM Maximum RPM = 3950													MAX HP = 0.173 x (RPM/ 1000) <sup>3</sup>										
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CFM	OV	0.5" S.P.		1" S.P.		1.5" S.P.		2" S.P.		3" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		10" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2000	1307	1322	0.35	1489	0.55	1637	0.76	1793	0.98	2111	1.49														
2250	1471	1440	0.44	1599	0.66	1739	0.89	1872	1.13	2146	1.65	2430	2.25												
2500	1634			1714	0.79	1846	1.04	1967	1.30	2212	1.85	2465	2.46	2715	3.13										
2750	1797			1832	0.93	1956	1.21	2072	1.49	2291	2.07	2511	2.69	2749	3.39	2975	4.12	3213	4.92						
3000	1961			1951	1.10	2071	1.40	2180	1.70	2383	2.31	2589	2.97	2785	3.67	3010	4.44	3217	5.24	3435	6.09				
3250	2124			2069	1.28	2187	1.61	2293	1.93	2488	2.59	2669	3.28	2862	4.01	3045	4.77	3252	5.61	3445	6.47	3643	7.38		
3500	2288					2306	1.84	2408	2.19	2595	2.90	2767	3.62	2941	4.37	3117	5.17	3287	5.99	3480	6.90	3662	7.82	3840	8.78
3750	2451					2425	2.10	2525	2.47	2703	3.23	2872	3.99	3026	4.77	3195	5.60	3357	6.45	3516	7.34	3697	8.31	3868	9.29
4000	2614					2543	2.38	2643	2.78	2817	3.58	2978	4.39	3130	5.21	3275	6.06	3435	6.95	3586	7.87	3732	8.81	3903	9.83
4250	2778							2763	3.12	2932	3.96	3086	4.83	3235	5.68	3373	6.56	3515	7.48	3664	8.43	3806	9.40	3940	10.39
4500	2941							2880	3.48	3048	4.37	3198	5.28	3342	6.20	3478	7.11	3606	8.05	3744	9.03	3884	10.04	4018	
4750	3105							2999	3.86	3166	4.82	3313	5.77	3450	6.75	3584	7.70	3710	8.67	3830	9.67				

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 165-9-100 1X1

Tip Speed, FPM = 4.32 x RPM Maximum RPM = 3550													MAX HP = 0.249 x (RPM/ 1000) <sup>3</sup>										
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		10" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	811	1136	0.36	1341	0.55																				
2000	1081	1259	0.49	1427	0.72	1586	0.96	1740	1.22	1889	1.50														
2500	1351	1414	0.66	1557	0.92	1690	1.20	1824	1.50	1949	1.80	2197	2.46												
3000	1622	1584	0.88	1712	1.18	1830	1.49	1946	1.82	2055	2.16	2272	2.87	2485	3.64	2682	4.43								
3500	1892	1764	1.15	1879	1.49	1988	1.84	2089	2.20	2192	2.58	2381	3.36	2572	4.19	2751	5.05	2933	5.96	3102	6.89	3273	7.86		
4000	2162			2057	1.86	2155	2.25	2251	2.65	2342	3.06	2519	3.92	2684	4.81	2853	5.74	3012	6.70	3171	7.70	3330	8.74	3480	9.79
4500	2432			2239	2.31	2332	2.74	2419	3.18	2505	3.62	2666	4.55	2824	5.52	2973	6.51	3121	7.54	3269	8.61	3408	9.70	3549	10.82
5000	2703					2513	3.31	2596	3.79	2675	4.28	2828	5.27	2971	6.31	3114	7.38	3250	8.48	3379	9.61	3517	10.77		
5500	2973					2698	3.98	2777	4.49	2852	5.01	2994	6.09	3132	7.19	3262	8.34	3391	9.51	3518	10.71				
6000	3243							2961	5.30	3033	5.86	3168	7.01	3298	8.19	3423	9.40	3542	10.65						
6500	3514									3217	6.82	3347	8.04	3469	9.30										
7000	3784											3528	9.19												

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.



# PERFORMANCE DATA

## ESA | 165-12-100 1x1

Tip Speed, FPM = 4.32 x RPM Maximum RPM = 3550	MAX HP = 0.27 x (RPM/ 1000) <sup>3</sup>
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		10" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1500	811	1118	0.37																						
2000	1081	1237	0.50	1400	0.73	1562	0.99																		
2500	1351	1398	0.69	1530	0.95	1658	1.23	1792	1.53	1918	1.84														
3000	1622	1571	0.92	1691	1.23	1799	1.54	1911	1.87	2014	2.20	2236	2.94	2456	3.73										
3500	1892	1752	1.22	1863	1.57	1965	1.92	2059	2.28	2153	2.65	2336	3.44	2527	4.28	2708	5.17	2902	6.11						
4000	2162	1933	1.58	2041	1.97	2137	2.37	2226	2.77	2310	3.18	2475	4.03	2635	4.92	2799	5.86	2964	6.86	3123	7.88	3293	8.96		
4500	2432	2114	2.00	2224	2.46	2314	2.90	2398	3.34	2479	3.80	2628	4.71	2775	5.67	2919	6.67	3058	7.71	3210	8.80	3354	9.92	3494	11.07
5000	2703			2404	3.02	2495	3.52	2576	4.00	2652	4.50	2796	5.50	2928	6.53	3060	7.60	3192	8.69	3317	9.82	3448	11.00		
5500	2973			2586	3.67	2678	4.23	2757	4.77	2830	5.30	2967	6.40	3095	7.50	3215	8.63	3333	9.80	3456	11.00				
6000	3243					2858	5.02	2941	5.64	3011	6.22	3142	7.39	3265	8.59	3382	9.80	3493	11.04						
6500	3514					3040	5.93	3120	6.59	3195	7.26	3321	8.51	3440	9.80										
7000	3784							3301	7.66	3374	8.37	3503	9.76												

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 182-9-100 1X1

Tip Speed, FPM = 4.78 x RPM Maximum RPM = 3300	MAX HP = 0.419 x (RPM/ 1000) <sup>3</sup>
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		3" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		10" S.P.		11" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	1327	1247	0.76	1369	1.06	1490	1.38	1733	2.09																
3250	1438	1310	0.85	1425	1.17	1536	1.51	1761	2.25	1984	3.06														
3500	1549	1376	0.96	1484	1.30	1589	1.65	1794	2.41	2004	3.25	2210	4.15												
3750	1659	1442	1.08	1546	1.43	1645	1.81	1839	2.60	2033	3.46	2227	4.38												
4000	1770	1510	1.21	1610	1.58	1703	1.97	1885	2.79	2066	3.68	2248	4.63	2431	5.63										
4500	1991	1648	1.50	1742	1.92	1828	2.34	1993	3.23	2154	4.17	2314	5.18	2477	6.23	2641	7.35	2798	8.50						
5000	2212	1789	1.85	1877	2.30	1959	2.77	2111	3.72	2258	4.73	2403	5.79	2545	6.90	2694	8.06	2838	9.27	2986	10.53	3127	11.82		
5500	2434			2016	2.75	2093	3.25	2236	4.28	2371	5.37	2505	6.49	2636	7.65	2767	8.87	2901	10.13	3032	11.43	3166	12.78	3299	14.17
6000	2655			2156	3.26	2230	3.81	2366	4.91	2494	6.06	2617	7.25	2738	8.48	2859	9.75	2980	11.07	3100	12.43	3223	13.82		
7000	3097					2510	5.13	2635	6.39	2751	7.69	2862	9.02	2968	10.39	3074	11.79	3178	13.23	3278	14.69				
8000	3540							2913	8.22	3020	9.66	3122	11.14	3219	12.66										
9000	3982									3297	12.03														

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 182-12-100 1x1

Tip Speed, FPM = 4.78 x RPM Maximum RPM = 3300	MAX HP = 0.462 x (RPM/ 1000) <sup>3</sup>
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		3" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		10" S.P.		11" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	1327	1191	0.77	1319	1.06	1450	1.38	1718	2.09																
3250	1438	1249	0.87	1368	1.18	1486	1.51	1732	2.24																
3500	1549	1308	0.98	1420	1.31	1530	1.65	1754	2.40	1984	3.25														
3750	1659	1369	1.10	1476	1.45	1579	1.81	1785	2.59	2000	3.45	2215	4.40												
4000	1770	1432	1.23	1534	1.60	1631	1.98	1823	2.78	2020	3.66	2222	4.62												
4500	1991	1559	1.53	1654	1.95	1744	2.37	1914	3.23	2085	4.16	2262	5.15	2443	6.22	2622	7.36								
5000	2212	1689	1.87	1779	2.34	1862	2.81	2019	3.75	2172	4.73	2326	5.77	2486	6.87	2648	8.04	2807	9.26	2971	10.57				
5500	2434			1906	2.79	1985	3.30	2133	4.33	2274	5.39	2413	6.48	2552	7.62	2698	8.82	2842	10.08	2991	11.41	3137	12.79	3284	14.22
6000	2655			2036	3.30	2111	3.87	2251	4.99	2382	6.12	2511	7.27	2638	8.47	2766	9.71	2900	11.02	3030	12.36	3167	13.78		
7000	3097					2370	5.19	2497	6.50	2616	7.81	2730	9.12	2841	10.46	2950	11.81	3059	13.21	3171	14.66	3279	16.13		
8000	3540							2753	8.33	2863	9.82	2967	11.32	3068	12.81	3165	14.33	3262	15.86						
9000	3982							3015	10.52	3117	12.21	3215	13.89												

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

# PERFORMANCE DATA

## ESA | 200-9-100 1x1

Tip Speed, FPM = 5.24 x RPM Maximum RPM = 3125	MAX HP = 0.661 x (RPM/ 1000) <sup>3</sup>
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CFM	OV	1" S.P.		2" S.P.		3" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		10" S.P.		11" S.P.		12" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3500	1287	1114	0.86	1342	1.59	1568	2.43																		
4000	1471	1209	1.05	1412	1.85	1609	2.73	1809	3.71																
4500	1654	1309	1.28	1494	2.14	1670	3.08	1848	4.11	2023	5.20														
5000	1838	1411	1.53	1584	2.47	1746	3.48	1904	4.55	2063	5.70	2220	6.92	2378	8.20										
5500	2022	1516	1.84	1679	2.84	1828	3.91	1973	5.05	2118	6.26	2262	7.53	2404	8.84	2550	10.24								
6000	2206			1778	3.27	1918	4.41	2051	5.61	2183	6.87	2317	8.19	2448	9.57	2581	11.01	2713	12.50	2844	14.04				
6500	2390			1878	3.73	2011	4.95	2138	6.22	2261	7.54	2380	8.91	2505	10.36	2625	11.84	2749	13.38	2868	14.96	2993	16.62	3111	18.29
7000	2574			1981	4.26	2108	5.54	2227	6.88	2342	8.27	2457	9.71	2568	11.20	2684	12.74	2794	14.33	2911	15.98	3023	17.66		
8000	2941			2190	5.48	2308	6.92	2418	8.40	2522	9.93	2625	11.50	2723	13.10	2825	14.77	2921	16.47	3023	18.23	3121	20.01		
9000	3309					2515	8.56	2617	10.19	2715	11.86	2807	13.56	2900	15.32	2989	17.10	3077	18.93						
10000	3676							2726	10.49	2822	12.26	2913	14.08	3001	15.93	3086	17.83								
11000	4044									3031	14.68	3118	16.64												

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 200-12-100 1X1

Tip Speed, FPM = 5.24 x RPM Maximum RPM = 3125	MAX HP = 0.729 x (RPM/ 1000) <sup>3</sup>
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CFM	OV	1" S.P.		2" S.P.		3" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		10" S.P.		11" S.P.		12" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	1103	991	0.71	1280	1.41																				
3500	1287	1073	0.87	1310	1.61	1562	2.49																		
4000	1471	1163	1.07	1367	1.86	1582	2.77	1804	3.80																
4500	1654	1258	1.29	1442	2.16	1626	3.11	1819	4.17	2017	5.34														
5000	1838	1356	1.55	1526	2.50	1687	3.50	1857	4.60	2033	5.80	2210	7.09												
6000	2206	1556	2.18	1709	3.31	1847	4.45	1983	5.65	2122	6.93	2264	8.28	2408	9.71	2559	11.24	2706	12.84						
7000	2574			1903	4.30	2028	5.63	2146	6.97	2262	8.35	2376	9.78	2498	11.29	2620	12.87	2745	14.52	2872	16.25	2999	18.04	3125	19.91
8000	2941			2102	5.49	2219	7.02	2326	8.52	2429	10.04	2529	11.61	2633	13.22	2734	14.88	2841	16.61	2943	18.37	3056	20.25		
9000	3309					2415	8.62	2516	10.32	2611	12.03	2703	13.73	2793	15.48	2884	17.27	2974	19.07	3063	20.94				
10000	3676					2615	10.48	2711	12.39	2801	14.28	2886	16.16	2970	18.08	3052	19.98								
11000	4044							2910	14.73	2996	16.84	3077	18.90												
12000	4412									3112	17.41														

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 222-9-100 1x1

Tip Speed, FPM = 5.83 x RPM Maximum RPM = 2675	MAX HP = 1.126 x (RPM/ 1000) <sup>3</sup>
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		10" S.P.		
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
4000	1190	954	0.94	1066	1.36	1177	1.80	1285	2.28	1394	2.79	1598	3.88													
4500	1339	1020	1.11	1120	1.55	1218	2.03	1318	2.54	1412	3.07	1605	4.21	1787	5.45											
5000	1488	1089	1.30	1182	1.78	1272	2.28	1358	2.81	1449	3.38	1623	4.57	1794	5.86	1958	7.23									
5500	1637	1160	1.52	1248	2.03	1329	2.57	1412	3.13	1490	3.71	1653	4.97	1811	6.31	1966	7.73	2116	9.23							
6000	1786	1234	1.77	1316	2.32	1395	2.89	1467	3.48	1544	4.09	1690	5.40	1837	6.79	1983	8.26	2125	9.81	2262	11.41	2398	13.11			
7000	2083	1384	2.36	1460	2.98	1529	3.62	1598	4.28	1662	4.96	1791	6.38	1913	7.87	2044	9.47	2166	11.10	2292	12.82	2417	14.62	2534	16.44	
8000	2381			1608	3.79	1673	4.50	1735	5.24	1795	5.99	1909	7.54	2021	9.15	2132	10.85	2240	12.59	2354	14.43	2460	16.29	2569	18.24	
9000	2679			1760	4.76	1821	5.56	1879	6.36	1934	7.18	2040	8.86	2141	10.61	2240	12.42	2341	14.30	2436	16.23	2535	18.23	2636	20.29	
10000	2976					1972	6.79	2027	7.68	2079	8.57	2177	10.40	2273	12.28	2364	14.22	2451	16.22	2544	18.27	2632	20.37			
11000	3274							2177	9.19	2227	10.17	2321	12.14	2408	14.16	2496	16.24	2579	18.35	2659	20.54					
12000	3571							2330	10.93	2377	11.99	2467	14.11	2551	16.27	2631	18.50									
13000	3869									2530	14.05	2616	16.35													

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

# PERFORMANCE DATA

## ESA | 222-12-100 1x1

Tip Speed, FPM = 5.83 x RPM Maximum RPM = 2675	MAX HP = 1.24 x (RPM/ 1000) <sup>3</sup>
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		10" S.P.		
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
4000	1190	926	0.96	1039	1.38	1159	1.86	1281	2.39																	
4500	1339	989	1.13	1087	1.58	1190	2.08	1297	2.62	1404	3.20															
5000	1488	1058	1.32	1147	1.81	1234	2.33	1328	2.88	1423	3.48	1620	4.80													
5500	1637	1129	1.54	1209	2.06	1291	2.61	1371	3.19	1457	3.81	1633	5.15	1811	6.63											
6000	1786	1201	1.78	1278	2.34	1352	2.93	1426	3.54	1500	4.18	1652	5.53	1820	7.06	1984	8.70									
7000	2083	1350	2.35	1421	3.01	1486	3.67	1548	4.35	1614	5.05	1738	6.50	1872	8.08	2010	9.76	2150	11.57	2291	13.48					
8000	2381	1502	3.05	1567	3.80	1629	4.56	1686	5.30	1741	6.09	1853	7.66	1959	9.32	2079	11.09	2191	12.92	2318	14.91	2440	16.97	2561	19.11	
9000	2679			1717	4.73	1775	5.59	1829	6.43	1881	7.28	1977	9.02	2079	10.81	2173	12.64	2277	14.60	2380	16.61	2479	18.70	2594	20.95	
10000	2976					1924	6.77	1975	7.72	2024	8.66	2116	10.54	2202	12.49	2294	14.46	2381	16.50	2467	18.60	2564	20.82	2656	23.08	
11000	3274					2075	8.14	2124	9.18	2170	10.22	2258	12.28	2341	14.38	2419	16.53	2502	18.67	2582	20.89	2659	23.17			
12000	3571							2275	10.84	2319	11.97	2403	14.27	2482	16.49	2557	18.77	2629	21.13							
13000	3869									2470	13.95	2550	16.40	2626	18.87											

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 245-9-100 1X1

Tip Speed, FPM = 6.41 x RPM Maximum RPM = 2269	MAX HP = 1.799 x (RPM/ 1000) <sup>3</sup>
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		3.5" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5000	1225	882	1.17	980	1.68	1085	2.24	1182	2.83	1273	3.44	1369	4.10												
5500	1348	928	1.34	1024	1.88	1111	2.46	1208	3.08	1296	3.73	1377	4.39	1466	5.12										
6000	1471	978	1.52	1069	2.10	1152	2.71	1234	3.35	1322	4.04	1403	4.74	1478	5.46	1636	7.02								
6500	1593	1030	1.71	1114	2.33	1196	2.98	1270	3.65	1348	4.36	1429	5.10	1504	5.86	1645	7.44								
7000	1716	1083	1.93	1162	2.60	1241	3.27	1313	3.97	1380	4.71	1455	5.48	1530	6.27	1668	7.92	1800	9.66						
7500	1838	1137	2.16	1213	2.87	1286	3.59	1358	4.33	1424	5.09	1486	5.89	1556	6.70	1693	8.41	1818	10.21	1943	12.10				
8000	1961	1193	2.42	1265	3.17	1333	3.94	1403	4.71	1468	5.50	1529	6.32	1587	7.17	1720	8.95	1844	10.81	1959	12.74	2077	14.77	2194	16.87
8500	2083	1249	2.70	1318	3.49	1384	4.30	1449	5.12	1513	5.94	1573	6.79	1630	7.67	1746	9.50	1870	11.43	1984	13.41	2091	15.47	2203	17.64
9000	2206			1372	3.84	1436	4.68	1496	5.55	1558	6.41	1618	7.30	1674	8.20	1779	10.09	1896	12.07	2010	14.13	2117	16.26	2217	18.43
11000	2696					1652	6.52	1705	7.56	1756	8.57	1806	9.64	1855	10.68	1955	12.81	2048	15.03	2135	17.32	2222	19.68		
13000	3186							1926	10.06	1971	11.27	2015	12.48	2059	13.69	2143	16.18	2229	18.68						
15000	3676											2236	15.93												

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 245-12-100 1x1

Tip Speed, FPM = 6.41 x RPM Maximum RPM = 2269	MAX HP = 1.991 x (RPM/ 1000) <sup>3</sup>
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		3.5" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
5000	1225	847	1.18	950	1.70	1054	2.28	1163	2.93																	
5500	1348	892	1.34	988	1.89	1077	2.48	1176	3.14	1274	3.86	1365	4.62													
6000	1471	940	1.53	1027	2.11	1114	2.72	1193	3.38	1288	4.12	1378	4.91	1462	5.72											
6500	1593	990	1.73	1070	2.35	1153	3.00	1230	3.68	1302	4.39	1391	5.20	1475	6.05											
7000	1716	1041	1.94	1118	2.61	1192	3.29	1268	4.00	1338	4.74	1405	5.52	1489	6.40	1642	8.22									
7500	1838	1092	2.17	1167	2.90	1235	3.61	1307	4.35	1376	5.12	1441	5.93	1503	6.76	1656	8.66	1795	10.66							
8000	1961	1144	2.43	1216	3.20	1283	3.96	1346	4.73	1415	5.54	1479	6.37	1539	7.22	1669	9.09	1808	11.15	1936	13.31					
8500	2083	1197	2.71	1267	3.52	1331	4.33	1391	5.14	1454	5.98	1517	6.84	1577	7.73	1688	9.57	1822	11.68	1949	13.89	2068	16.19			
9000	2206	1251	3.02	1319	3.87	1381	4.75	1440	5.59	1495	6.45	1556	7.34	1615	8.26	1725	10.16	1835	12.20	1963	14.50	2081	16.84	2193	19.29	
11000	2696			1529	5.52	1586	6.55	1639	7.61	1689	8.69	1737	9.70	1784	10.75	1879	12.90	1976	15.12	2067	17.43	2153	19.82	2247	22.39	
13000	3186					1798	8.90	1847	10.10	1893	11.32	1937	12.56	1980	13.85	2062	16.29	2140	18.78	2222	21.33					
15000	3676							2061	13.23	2103	14.58	2145	15.99	2185	17.41	2261	20.31									

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

# PERFORMANCE DATA

## ESA | 270-9-100 1x1

Tip Speed, FPM = 7.07 x RPM Maximum RPM = 2146												MAX HP = 2.934 x (RPM/ 1000) <sup>3</sup>											
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		3.5" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5000	1010	744	1.20	855	1.79																				
5500	1111	774	1.33	875	1.96	979	2.65																		
6000	1212	804	1.48	904	2.15	995	2.86	1089	3.63																
6500	1313	840	1.65	933	2.35	1019	3.09	1106	3.89	1191	4.73														
7000	1414	877	1.84	964	2.57	1048	3.34	1123	4.15	1207	5.03	1286	5.95												
8000	1616	954	2.25	1032	3.06	1108	3.90	1182	4.79	1250	5.71	1319	6.67	1391	7.67	1525	9.79								
9000	1818	1035	2.74	1106	3.62	1174	4.54	1242	5.50	1308	6.47	1371	7.51	1429	8.55	1557	10.78	1678	13.14						
10000	2020	1118	3.32	1185	4.27	1247	5.26	1308	6.29	1369	7.35	1430	8.44	1488	9.56	1595	11.89	1711	14.37	1821	16.93				
12000	2424			1348	5.87	1405	7.01	1458	8.19	1509	9.39	1560	10.62	1609	11.89	1712	14.47	1807	17.16	1896	19.95	1991	22.90	2087	25.91
14000	2828					1569	9.22	1618	10.53	1665	11.89	1709	13.27	1753	14.67	1840	17.55	1927	20.52	2014	23.59	2095	26.71		
16000	3232							1783	13.42	1827	14.93	1869	16.45	1909	18.00	1986	21.19	2064	24.45	2137	27.79				
18000	3637											1993	18.58	2032	20.23	2070	21.92	2143	25.40						

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 270-12-100 1x1

Tip Speed, FPM = 7.07 x RPM Maximum RPM = 2146												MAX HP = 3.107 x (RPM/ 1000) <sup>3</sup>											
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		3.5" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
5000	1010	739	1.24	855	1.88																				
6000	1212	799	1.54	899	2.24	992	2.99	1094	3.81																
7000	1414	873	1.90	956	2.66	1042	3.48	1119	4.35	1208	5.28	1292	6.24												
8000	1616	951	2.33	1026	3.16	1099	4.05	1174	4.97	1244	5.96	1314	6.98	1393	8.06										
9000	1818	1032	2.85	1102	3.75	1167	4.70	1232	5.70	1300	6.74	1363	7.81	1423	8.94	1559	11.33	1689	13.82						
10000	2020	1115	3.46	1181	4.43	1241	5.44	1300	6.51	1358	7.62	1420	8.76	1479	9.95	1587	12.40	1710	15.05	1830	17.81				
11000	2222	1200	4.17	1262	5.21	1320	6.31	1374	7.43	1428	8.62	1478	9.81	1536	11.07	1643	13.66	1741	16.37	1852	19.28	1963	22.26	2068	25.35
12000	2424			1345	6.11	1400	7.27	1452	8.48	1502	9.72	1551	11.00	1597	12.30	1700	15.03	1797	17.88	1888	20.86	1985	23.96	2089	27.18
13000	2626			1429	7.13	1482	8.37	1532	9.64	1579	10.95	1625	12.30	1670	13.67	1758	16.52	1854	19.52	1943	22.60	2027	25.79	2111	29.10
15000	3030					1650	10.98	1696	12.39	1740	13.85	1782	15.33	1823	16.85	1902	19.97	1978	23.19	2058	26.56	2140	30.01		
17000	3434							1864	15.76	1905	17.35	1945	18.99	1983	20.64	2056	24.05	2126	27.55						
19000	3839									2074	21.56	2111	23.33												

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 300-9-100 1x1

Tip Speed, FPM = 7.85 x RPM Maximum RPM = 1931												MAX HP = 4.944 x (RPM/ 1000) <sup>3</sup>											
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		3.5" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
8000	1309	756	2.03	836	2.89	916	3.80	992	4.78	1069	5.81															
9000	1473	809	2.41	885	3.34	956	4.32	1027	5.36	1093	6.44	1163	7.57	1229	8.75											
10000	1636	866	2.84	936	3.84	1002	4.89	1066	5.99	1130	7.13	1190	8.33	1252	9.56	1373	12.18									
11000	1800	925	3.33	989	4.40	1052	5.52	1111	6.69	1170	7.92	1228	9.15	1284	10.47	1396	13.19	1505	16.06							
12000	1964	984	3.89	1046	5.04	1104	6.23	1161	7.46	1215	8.77	1268	10.08	1323	11.45	1424	14.28	1528	17.27	1629	20.43					
13000	2127	1045	4.53	1104	5.74	1159	7.02	1213	8.34	1265	9.68	1314	11.08	1362	12.49	1463	15.48	1554	18.55	1651	21.81	1745	25.22			
14000	2291			1164	6.55	1216	7.88	1266	9.29	1316	10.69	1364	12.15	1410	13.66	1502	16.75	1593	19.98	1677	23.32	1768	26.84	1856	30.49	
15000	2455			1224	7.44	1275	8.85	1322	10.29	1368	11.79	1415	13.32	1460	14.89	1544	18.14	1632	21.49	1716	24.98	1794	28.54	1879	32.33	
17000	2782					1394	11.05	1439	12.66	1481	14.28	1522	15.97	1563	17.68	1644	21.18	1719	24.81	1794	28.54	1872	32.43			
19000	3109					1517	13.67	1558	15.43	1598	17.21	1637	19.04	1674	20.89	1748	24.73	1820	28.59	1889	32.63					
21000	3436							1681	18.69	1718	20.63	1755	22.60	1790	24.58	1858	28.69	1924	32.90							
23000	3764									1841	24.55	1874	26.65	1908	28.79											

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

# PERFORMANCE DATA

## ESA | 300-12-100 1x1

Tip Speed, FPM = 7.85 x RPM Maximum RPM = 1931	MAX HP = 5.273 x (RPM/ 1000) <sup>3</sup>
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		3.5" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.			
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP		
8000	1309	751	2.10	828	2.99	912	3.97	991	5.00	1075	6.11																
9000	1473	805	2.49	879	3.46	948	4.49	1022	5.59	1089	6.73	1166	7.95	1238	9.22												
10000	1636	863	2.94	931	3.97	995	5.07	1057	6.22	1124	7.44	1186	8.71	1252	10.03	1383	12.82										
11000	1800	922	3.45	985	4.56	1046	5.72	1103	6.94	1160	8.22	1221	9.55	1279	10.94	1397	13.83	1516	16.92								
12000	1964	983	4.05	1043	5.22	1099	6.46	1154	7.74	1206	9.09	1257	10.46	1314	11.91	1419	14.92	1530	18.13	1639	21.48						
13000	2127	1044	4.72	1102	5.97	1155	7.28	1206	8.62	1257	10.04	1304	11.48	1350	12.97	1454	16.12	1549	19.40	1653	22.89	1755	26.54				
14000	2291			1161	6.79	1213	8.18	1260	9.60	1309	11.08	1355	12.59	1400	14.17	1490	17.41	1585	20.86	1672	24.40	1769	28.16	1864	32.02		
15000	2455			1222	7.72	1271	9.16	1318	10.68	1362	12.22	1407	13.80	1451	15.44	1532	18.81	1620	22.35	1707	26.05	1789	29.89	1878	33.86		
17000	2782					1392	11.49	1435	13.12	1477	14.83	1516	16.54	1555	18.29	1634	21.96	1707	25.75	1779	29.66	1860	33.79				
19000	3109					1516	14.28	1555	16.02	1595	17.88	1632	19.73	1668	21.63	1739	25.59	1809	29.62	1876	33.82						
21000	3436							1679	19.47	1715	21.42	1751	23.45	1785	25.48	1851	29.70	1915	34.08								
23000	3764									1839	25.59	1872	27.73	1905	29.93												

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 330-9-100 1x1

Tip Speed, FPM = 8.64 x RPM Maximum RPM = 1756	MAX HP = 7.846 x (RPM/ 1000) <sup>3</sup>
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		3.5" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.			
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP		
8000	1082	623	1.87	711	2.79	798	3.81																				
9000	1217	658	2.17	736	3.12	815	4.19	893	5.36																		
10000	1352	699	2.52	770	3.52	840	4.64	910	5.83	980	7.12	1048	8.46														
12000	1623	784	3.36	846	4.49	905	5.69	963	6.96	1022	8.33	1081	9.78	1137	11.27	1253	14.47										
14000	1893	874	4.40	930	5.69	983	7.02	1032	8.38	1084	9.84	1133	11.37	1184	12.97	1284	16.35	1384	19.96								
16000	2164	967	5.69	1018	7.12	1066	8.60	1113	10.12	1157	11.69	1202	13.31	1246	14.97	1332	18.51	1422	22.30	1506	26.27	1596	30.50	1680	34.81		
18000	2434			1110	8.85	1154	10.47	1197	12.15	1239	13.85	1278	15.55	1316	17.33	1397	21.08	1472	24.99	1553	29.18	1631	33.56	1706	38.08		
20000	2705			1204	10.92	1246	12.69	1285	14.49	1323	16.34	1361	18.20	1398	20.12	1467	24.04	1541	28.23	1609	32.50	1679	37.03	1752	41.80		
22000	2975					1338	15.22			1376	17.19	1412	19.19	1446	21.22	1481	23.25	1548	27.45	1611	31.81	1678	36.36	1741	41.00		
24000	3246							1469	20.30	1503	22.43	1536	24.61	1568	26.84	1631	31.28	1692	35.89	1749	40.59						
26000	3516									1595	26.09	1627	28.42	1657	30.75	1716	35.59										
28000	3787									1689	30.25	1719	32.69	1748	35.16												

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 330-12-100 1x1

Tip Speed, FPM = 8.64 x RPM Maximum RPM = 1756	MAX HP = 8.131 x (RPM/ 1000) <sup>3</sup>
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		3.5" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.			
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP		
8000	1083	626	1.94	708	2.88	793	3.95																				
9000	1218	664	2.25	736	3.23	811	4.33	887	5.54																		
10000	1353	706	2.59	774	3.65	838	4.78	905	6.01	973	7.35	1042	8.77														
12000	1624	795	3.42	854	4.62	911	5.89	965	7.22	1020	8.62	1076	10.11	1128	11.63	1246	15.01										
14000	1894	885	4.41	942	5.81	993	7.23	1041	8.69	1089	10.20	1134	11.76	1181	13.39	1277	16.89	1374	20.63								
16000	2165	978	5.63	1032	7.21	1080	8.79	1125	10.42	1167	12.09	1210	13.78	1251	15.51	1330	19.13	1416	23.04	1496	27.13	1585	31.54	1671	36.13		
18000	2436			1123	8.82	1170	10.63	1213	12.43	1253	14.23	1291	16.08	1328	17.96	1403	21.84	1472	25.86	1549	30.19	1622	34.61	1692	39.23		
20000	2706			1217	10.75	1261	12.70	1302	14.69	1341	16.69	1378	18.70	1413	20.74	1480	24.91	1548	29.22	1611	33.63	1676	38.27	1745	43.14		
22000	2977					1354	15.10	1393	17.24	1431	19.47	1466	21.64	1500	23.83	1564	28.32	1625	32.93	1687	37.63	1746	42.49				
24000	3248					1448	17.84	1485	20.12	1521	22.48	1556	24.92	1589	27.33	1651	32.11	1709	37.02								
26000	3518							1579	23.42	1614	25.96	1647	28.51	1679	31.11	1739	36.29										
28000	3789									1707	29.79	1739	32.51														

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

# PERFORMANCE DATA

## ESA | 365-9-100 1X1

Tip Speed, FPM = 9.56 x RPM Maximum RPM = 1587												MAX HP = 12.957 x (RPM/ 1000) <sup>3</sup>											
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		3.5" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
10000	1105	568	2.34	646	3.48	723	4.74																			
12000	1326	625	3.00	690	4.22	755	5.57	819	7.01	882	8.56															
14000	1547	687	3.80	744	5.13	800	6.56	856	8.12	910	9.73	966	11.46	1020	13.27											
16000	1768	752	4.75	805	6.25	854	7.78	904	9.43	951	11.14	1001	12.97	1048	14.86	1145	18.88	1240	23.21							
18000	1989	820	5.93	869	7.56	915	9.24	958	10.96	1002	12.79	1045	14.70	1088	16.68	1174	20.90	1261	25.38	1344	30.10					
20000	2210	889	7.26	935	9.07	977	10.89	1019	12.79	1058	14.71	1097	16.70	1137	18.81	1214	23.17	1291	27.80	1369	32.71	1446	37.91	1521	43.23	
22000	2431			1003	10.85	1043	12.80	1081	14.83	1119	16.91	1155	19.03	1190	21.21	1262	25.79	1332	30.60	1403	35.69	1472	40.96	1544	46.57	
24000	2652			1072	12.82	1110	14.99	1147	17.18	1181	19.37	1216	21.64	1249	23.92	1314	28.68	1379	33.67	1443	38.92	1509	44.43	1572	50.16	
26000	2873					1178	17.43	1213	19.76	1246	22.10	1278	24.52	1310	26.95	1371	31.93	1432	37.19	1492	42.62	1550	48.25			
28000	3094					1248	20.15	1281	22.72	1313	25.21	1343	27.71	1373	30.33	1432	35.59	1488	41.03	1545	46.73					
30000	3315							1350	25.92	1380	28.60	1410	31.30	1438	33.99	1494	39.62	1548	45.26							
32000	3536									1449	32.37	1477	35.21	1505	38.10	1558	43.96									

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 365-12-100 1x1

Tip Speed, FPM = 9.56 x RPM Maximum RPM = 1587												MAX HP = 13.535 x (RPM/ 1000) <sup>3</sup>											
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		3.5" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
10000	1105	571	2.43	643	3.59	718	4.90																			
12000	1326	631	3.09	692	4.36	753	5.75	814	7.24	876	8.86	940	10.59													
14000	1547	696	3.88	751	5.31	804	6.81	855	8.38	906	10.05	960	11.85	1013	13.73											
16000	1768	762	4.80	815	6.42	862	8.06	908	9.75	952	11.53	999	13.41	1043	15.34	1138	19.55	1232	24.05							
18000	1989	830	5.90	880	7.68	926	9.51	967	11.36	1009	13.27	1048	15.22	1088	17.25	1168	21.54	1253	26.24	1334	31.16	1421	36.43			
20000	2210			947	9.13	991	11.16	1031	13.16	1068	15.21	1106	17.33	1142	19.46	1214	23.97	1286	28.71	1361	33.83	1436	39.18	1511	44.82	
22000	2431			1015	10.79	1057	12.97	1096	15.20	1132	17.39	1167	19.69	1200	21.94	1267	26.71	1332	31.65	1398	36.83	1463	42.28	1533	48.04	
24000	2652					1124	15.01	1162	17.43	1197	19.84	1230	22.22	1262	24.69	1325	29.76	1385	34.93	1444	40.29	1506	45.96	1564	51.73	
26000	2873					1192	17.31	1229	19.90	1263	22.50	1296	25.15	1326	27.69	1385	33.07	1443	38.57	1498	44.16	1552	49.97			
28000	3094							1296	22.60	1330	25.41	1361	28.19	1392	31.07	1449	36.70	1502	42.48	1556	48.40					
30000	3315							1365	25.66	1397	28.57	1428	31.56	1458	34.62	1513	40.60	1565	46.67							
32000	3536									1466	32.13	1495	35.20	1524	38.40	1579	44.94									

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

## ESA | 402-9-100 1X1

Tip Speed, FPM = 10.74 x RPM Maximum RPM = 1440												MAX HP = 21.175 x (RPM/ 1000) <sup>3</sup>											
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		3.5" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.		
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	
14000	1273	553	3.43	614	4.87	675	6.48	736	8.23	796	10.09															
16000	1455	598	4.17	653	5.74	706	7.42	760	9.26	813	11.20	866	13.29	918	15.41											
18000	1636	646	5.06	696	6.75	744	8.54	792	10.47	839	12.48	886	14.63	934	16.87	1027	21.64									
20000	1818	696	6.09	742	7.91	787	9.86	829	11.84	873	13.99	915	16.21	958	18.53	1043	23.46	1127	28.76							
22000	2000	746	7.26	790	9.25	832	11.32	872	13.46	910	15.64	950	17.99	988	20.40	1066	25.51	1144	30.99	1220	36.75					
24000	2182	798	8.61	840	10.78	879	12.99	916	15.23	953	17.59	988	19.97	1024	22.48	1095	27.78	1166	33.38	1238	39.37	1307	45.56	1377	52.02	
26000	2364			890	12.48	927	14.82	963	17.25	997	19.71	1031	22.25	1064	24.86	1130	30.32	1195	36.09	1261	42.23	1327	48.64	1392	55.36	
28000	2545			941	14.37	977	16.90	1010	19.44	1043	22.03	1075	24.73	1106	27.42	1167	33.10	1229	39.09	1290	45.39	1351	51.95	1412	58.82	
30000	2727					1027	19.18	1060	21.91	1091	24.67	1121	27.42	1150	30.25	1209	36.19	1265	42.28	1323	48.80	1380	55.58	1437	62.55	
34000	3091					1130	24.43	1160	27.52	1189	30.56	1217	33.68	1244	36.79	1297	43.20	1349	49.86	1399	56.66					
38000	3455							1263	34.12	1290	37.59	1316	40.95	1342	44.45	1391	51.44	1438	58.50							
										1394	45.73	1418	49.51													

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

# PERFORMANCE DATA

ESA | 402-12-100 1x1

Tip Speed, FPM = 10.54 x RPM Maximum RPM = 1440	MAX HP = 22.074 x (RPM/ 1000) <sup>3</sup>
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CFM	OV	1" S.P.		1.5" S.P.		2" S.P.		2.5" S.P.		3" S.P.		3.5" S.P.		4" S.P.		5" S.P.		6" S.P.		7" S.P.		8" S.P.		9" S.P.	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
14000	1273	559	3.56	616	5.07	672	6.69	731	8.50	791	10.46														
16000	1455	606	4.29	658	5.95	707	7.68	757	9.55	808	11.57	859	13.70	913	16.02										
18000	1636	655	5.15	704	6.97	749	8.86	793	10.82	838	12.93	881	15.09	928	17.44	1021	22.46								
20000	1818	705	6.13	752	8.13	795	10.19	835	12.30	875	14.48	914	16.75	954	19.12	1036	24.24	1120	29.83						
22000	2000	755	7.22	801	9.43	842	11.66	880	13.90	916	16.22	953	18.63	988	21.10	1061	26.33	1136	31.98	1211	38.01	1288	44.44		
24000	2182			851	10.88	890	13.25	927	15.73	962	18.19	995	20.72	1029	23.33	1094	28.72	1161	34.50	1230	40.67	1297	47.09	1369	54.00
26000	2364			901	12.46	940	15.08	975	17.66	1008	20.31	1041	23.03	1071	25.71	1133	31.39	1193	37.27	1255	43.57	1318	50.17	1381	57.08
28000	2545			952	14.25	990	17.04	1024	19.81	1057	22.68	1087	25.50	1117	28.37	1174	34.28	1231	40.42	1288	46.91	1345	53.61	1403	60.69
30000	2727					1040	19.17	1074	22.18	1105	25.14	1135	28.18	1164	31.28	1219	37.47	1272	43.84	1325	50.51	1378	57.44	1431	64.53
34000	3091							1174	27.41	1205	30.85	1234	34.29	1261	37.66	1312	44.56	1362	51.59	1408	58.68				
38000	3455									1306	37.42	1333	41.13	1360	45.01	1409	52.55								
42000	3818											1435	49.16												

Performance certified is for installation type A - Free inlet, Free outlet. Power rating (BHP) does not include transmission losses. Performance ratings do not include the effects of appurtenances in the airstream.

# SOUND PERFORMANCE

## ESA | 105-9-100 1X1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
400	0.500	1281	50/55	56/58	62/65	54/52	48/51	48/49	46/47	42/48	58/59	46.2	4.2
	1.000	1693	55/63	60/61	69/71	62/60	55/57	55/56	53/52	50/54	65/66	53.4	6.6
800	0.500	1786	57/63	61/62	70/73	64/62	57/59	57/59	55/54	52/57	66/68	54.9	7.2
	1.500	2334	64/69	64/66	74/78	75/72	64/64	61/64	61/61	58/62	74/74	62.3	10.9
1200	4.000	3386	73/82	72/76	74/76	84/84	75/74	70/72	70/71	70/67	83/83	71.3	18.5
	1.000	2622	67/72	67/71	71/73	78/81	70/69	65/68	65/67	63/63	77/80	65.8	13.3
	1.500	2840	68/75	67/73	72/73	80/82	72/70	66/68	66/67	64/66	79/81	67.8	14.8
	3.000	3380	73/82	72/76	74/76	84/84	75/74	70/72	70/71	70/67	83/83	71.3	18.4
	5.000	3991	77/87	76/78	77/79	88/87	79/79	73/77	73/74	75/72	87/86	75.1	23.2
1600	7.000	4551	80/91	78/81	80/82	90/89	84/83	77/80	75/77	78/75	94/89	78.5	28.0
	9.000	5080	82/92	81/88	83/85	87/87	93/91	80/83	78/80	80/78	94/93	82.4	42.1
	1.500	3397	73/82	73/77	74/77	83/85	75/76	71/74	71/73	72/70	84/84	71.1	19.0
	4.000	4167	78/89	76/79	78/80	89/87	80/80	74/78	74/75	76/73	88/87	76.1	24.6
	6.000	4668	80/91	79/82	81/83	91/89	86/84	77/81	76/78	78/76	96/90	79.2	29.1
2000	8.000	5126	82/92	81/89	83/85	87/87	93/91	80/83	78/80	80/78	94/93	82.5	41.1
	10.000	5560	83/93	84/94	85/87	86/87	95/93	82/85	80/83	81/80	96/95	84.4	40.0
	3.000	4431	79/91	78/80	79/82	88/88	83/82	76/80	75/77	78/76	0/89	76.8	26.4
2400	6.000	5155	82/92	82/90	83/85	87/87	93/91	80/84	78/81	80/78	94/93	82.7	40.5
	8.000	5568	83/93	84/94	85/87	86/87	95/93	82/85	80/83	81/80	96/95	84.5	40.1
2400	4.000	5244	82/92	82/91	83/86	87/87	91/91	80/85	79/82	80/80	93/94	81.2	36.5
	5.000	5469	83/93	84/93	84/87	86/87	95/92	82/86	80/83	81/80	96/95	84.0	39.1

## ESA | 105-12-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
600	0.500	1552	56/56	59/60	67/68	60/60	55/59	58/59	57/54	54/55	65/66	53.5	6.9
	1.500	2093	64/63	64/65	65/68	74/74	62/65	63/66	64/63	61/63	73/74	61.8	10.7
	3.000	2831	72/72	69/70	72/74	77/79	72/73	69/72	71/72	70/68	79/80	67.4	16.4
900	1.000	2275	66/66	65/66	67/70	76/77	65/67	65/68	66/66	64/63	75/76	63.8	12.1
	2.000	2660	71/70	68/69	71/72	79/80	70/71	68/71	70/70	68/67	79/80	67.1	15.3
	4.000	3353	76/76	73/74	74/77	81/82	77/78	74/77	75/76	74/72	84/84	71.8	21.4
	7.000	4323	79/80	79/80	79/82	80/83	85/86	81/84	81/82	81/78	89/91	77.6	30.3
1200	1.500	2942	73/73	70/71	72/74	80/81	73/74	70/73	72/72	71/68	81/82	69.1	17.6
	3.000	3395	76/76	74/74	75/77	81/83	78/79	74/77	75/76	75/72	84/85	72.1	21.7
	5.000	3020	78/79	77/78	77/80	79/81	84/85	79/81	78/80	79/75	87/88	75.6	28.0
	8.000	4695	81/81	80/82	82/84	81/85	86/87	83/86	84/85	82/80	91/92	79.3	33.8
1500	10.000	5188	82/83	82/84	84/87	83/87	88/89	86/89	86/88	85/83	95/95	81.4	39.5
	2.000	3582	77/77	75/76	75/78	79/81	80/81	76/79	76/77	76/73	85/86	73.0	23.1
	4.000	4088	79/79	78/79	78/80	79/82	84/85	80/83	79/81	79/77	88/89	76.4	38.0
	6.000	4529	80/81	80/81	81/83	80/84	86/86	82/85	82/84	82/79	90/91	78.5	32.1
1800	9.000	5156	82/83	82/83	84/86	82/87	88/88	85/89	86/88	85/83	96/95	81.3	39.2
	3.000	4327	80/80	79/80	79/82	80/83	85/86	81/84	81/82	81/78	89/91	77.6	30.4
	5.000	4757	81/82	81/82	82/84	81/85	86/87	84/87	84/86	82/80	91/93	79.5	34.4
2250	8.000	5320	82/83	83/84	85/87	83/87	88/89	86/89	87/89	85/83	97/95	82.0	40.8
	4.000	5276	82/83	82/84	85/87	83/87	88/89	86/89	87/89	85/83	95/95	81.8	40.3
	5.000	5467	82/83	83/85	86/88	84/88	89/90	87/90	88/90	86/84	96/96	82.6	42.2

The sound power level ratings shown are in decibels referred to 10<sup>-12</sup> watts calculated per AMCA International Standard 301. dBA levels are not licensed by AMCA International. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWI and LWiA, and outlet LWO and LWOA sound power levels for installation Type A: Free inlet, Free outlet.

The sound ratings shown are loudness values in fan sones at 1.5m (5 ft) in a hemispherical free field calculated per AMCA International Standard 301. Values shown are for Installation Type A: free inlet hemispherical sone levels.



# SOUND PERFORMANCE

## ESA | 122-9-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
1000	0.500	1525	60/62	66/66	69/73	63/62	57/60	59/58	54/54	47/52	66/68	54.7	7.1
	1.500	1986	66/66	70/69	73/77	69/68	62/64	63/64	61/60	55/58	71/73	59.8	9.7
	2.500	2377	72/69	72/71	76/77	75/76	69/68	67/68	66/65	60/62	76/77	64.5	12.9
1400	1.000	2142	69/68	71/71	76/80	73/73	65/68	66/67	65/64	57/61	74/76	63.0	11.8
	2.000	2492	73/71	73/73	76/78	77/82	71/71	68/69	67/67	62/63	78/81	66.3	14.3
	3.000	2798	76/73	74/75	78/78	81/84	74/73	70/72	70/70	66/66	81/83	69.3	17.0
1800	6.000	3614	81/79	80/80	81/81	87/88	79/79	76/78	76/76	74/72	87/88	75.5	24.7
	1.000	2546	73/72	74/74	77/78	80/83	74/73	70/71	71/69	64/64	81/82	69.1	16.6
	2.000	2856	76/75	75/76	79/79	82/86	75/75	71/73	71/71	67/67	82/84	70.7	18.3
	3.000	3126	78/76	76/77	80/80	84/87	76/77	73/75	73/73	69/69	84/86	72.2	20.3
	5.000	3607	80/79	80/80	81/82	87/88	79/80	76/78	76/76	74/72	87/88	75.4	24.6
2200	7.000	4047	83/82	83/83	83/84	90/91	82/82	79/81	78/79	77/76	90/90	78.4	29.3
	9.000	4462	84/84	84/85	85/86	92/92	87/86	82/83	81/81	80/78	0/93	80.9	43.3
	1.500	3114	77/77	77/78	80/81	85/88	78/78	74/76	74/74	72/70	85/87	73.6	21.8
2400	5.000	3928	82/81	82/83	82/84	90/91	81/82	78/81	78/78	76/75	89/90	77.7	28.1
	7.000	4320	84/83	84/84	84/85	92/92	85/85	81/83	80/80	79/77	95/92	80.0	34.3
2800	2.000	3451	79/79	79/81	81/83	87/89	80/81	76/79	76/76	75/73	88/89	75.7	24.8
	4.000	3902	82/81	82/83	82/84	90/91	81/83	78/81	78/78	76/75	90/91	77.7	28.0
	6.000	4294	84/83	84/85	84/86	91/92	85/85	81/83	80/80	79/77	96/92	79.8	32.7
2800	2.500	3978	82/82	83/85	83/85	91/92	83/84	80/83	79/79	79/77	90/92	78.9	31.2
	4.000	4284	83/83	84/86	84/87	91/93	85/86	81/84	80/81	79/78	0/93	79.9	37.7

## ESA | 122-12-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
1000	0.500	1462	69/65	72/70	72/72	63/63	58/62	60/60	53/53	45/49	68/68	56.5	8.2
	2.000	2135	74/74	79/78	77/79	79/77	67/69	67/69	65/64	57/60	78/78	66.5	14.5
	3.000	2548	78/79	82/81	82/83	83/82	73/73	70/74	70/70	62/63	82/82	70.8	18.9
1400	1.000	2055	73/71	80/75	76/78	79/77	66/69	67/69	65/63	56/58	78/78	66.6	14.5
	2.500	2550	78/79	82/80	82/83	83/82	73/73	70/74	70/70	62/63	82/82	70.9	18.9
	4.000	3014	81/84	84/83	85/86	86/85	78/78	74/77	74/74	68/68	87/86	74.4	23.3
1800	6.000	3601	83/87	86/87	88/89	87/88	84/83	80/82	79/79	74/72	89/90	77.7	28.3
	1.000	2433	75/75	81/77	82/80	83/83	73/74	70/73	71/70	63/63	82/83	71.0	18.9
	2.000	2739	79/79	83/80	85/84	85/84	76/76	72/76	73/72	65/66	85/84	73.1	21.5
	3.000	2999	81/82	84/82	85/85	86/86	78/78	74/77	74/74	68/68	87/86	74.3	23.2
	5.000	3489	83/87	86/86	88/89	88/88	83/83	79/81	78/78	73/72	90/89	77.3	27.6
2200	7.000	3967	85/89	88/89	90/91	88/90	88/87	82/85	81/82	77/75	92/92	80.4	33.2
	9.000	4427	87/91	89/91	92/93	90/92	91/89	85/87	84/85	80/78	99/95	82.8	45.7
	1.500	2976	80/80	82/80	85/84	87/87	79/80	75/78	75/75	71/69	87/87	75.1	24.0
2600	4.000	3566	83/85	86/86	88/88	87/88	83/84	79/82	78/79	74/72	91/90	77.6	28.0
	8.000	4369	87/91	89/91	92/93	90/92	90/89	85/87	84/85	79/78	95/95	82.5	45.4
3000	1.500	3353	81/83	83/83	83/85	88/88	83/84	79/82	78/79	75/73	90/90	77.2	27.2
	4.000	3924	85/87	88/88	89/90	88/90	88/88	82/85	81/82	77/75	92/93	80.3	33.0
	7.000	4460	87/90	90/91	92/93	90/93	91/90	85/88	85/86	80/79	95/95	83.0	44.2
3000	2.000	3869	83/85	87/87	85/88	88/89	89/89	83/86	82/83	78/76	92/93	80.8	33.7
	4.000	4297	86/88	88/89	88/91	89/92	90/90	85/88	84/85	79/78	95/95	82.2	45.0

The sound power level ratings shown are in decibels referred to 10<sup>-12</sup> watts calculated per AMCA International Standard 301. dBA levels are not licensed by AMCA International. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWi and LWiA, and outlet LWo and LWoA sound power levels for installation Type A: Free inlet, Free outlet.

The sound ratings shown are loudness values in fan sones at 1.5m (5 ft) in a hemispherical free field calculated per AMCA International Standard 301. Values shown are for Installation Type A: free inlet hemispherical sone levels.

# SOUND PERFORMANCE

## ESA | 135-9-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
1500	0.500	1472	61/63	70/69	73/75	67/65	60/62	63/63	63/62	52/56	71/71	59.3	9.7
	2.000	2007	67/70	71/72	80/81	72/72	65/66	67/67	65/65	60/60	76/76	64.0	12.9
	4.000	2644	73/76	75/77	81/83	86/83	75/73	71/72	72/70	69/66	84/83	73.0	20.6
2000	1.000	2000	68/69	72/73	81/82	75/74	68/69	68/68	71/71	62/63	78/78	66.5	15.2
	3.000	2540	73/75	74/76	82/82	85/84	74/74	71/71	72/71	68/66	83/83	72.2	19.7
	6.000	3265	77/79	80/82	82/83	93/89	80/79	76/77	76/75	77/72	91/88	79.4	29.5
2500	8.000	3728	79/82	82/85	85/86	96/92	84/82	79/80	79/78	80/76	95/91	82.8	38.3
	1.500	2483	73/75	75/76	83/83	84/85	76/75	71/73	74/73	71/70	84/84	72.7	20.7
	4.000	3037	76/78	78/80	82/83	91/89	78/78	74/76	76/74	74/72	89/88	77.8	26.9
	7.000	3626	79/81	82/84	84/85	95/91	83/82	79/79	78/78	79/75	96/90	82.0	39.5
3000	9.000	40009	81/84	83/86	86/87	98/94	86/84	81/82	80/80	82/78	96/93	84.3	40.0
	10.000	4199	82/85	84/87	87/88	98/94	88/85	82/83	81/81	83/79	97/94	85.2	42.5
	2.000	2944	76/78	78/81	83/84	90/89	80/80	75/77	76/75	77/74	89/88	77.3	26.8
	5.000	3516	79/81	81/84	84/85	95/92	82/82	78/80	78/77	79/76	96/91	81.2	33.3
3500	7.000	3851	80/83	83/85	85/87	97/94	85/84	80/82	79/79	81/77	0/93	83.6	38.1
	9.000	4177	82/84	84/87	87/88	98/95	88/85	82/83	81/81	83/79	97/94	85.1	42.2
	3.000	3488	80/81	82/85	84/86	94/92	83/83	79/82	78/77	80/76	0/91	81.3	39.5
4000	6.000	3981	81/84	83/86	86/88	97/95	86/85	81/83	80/80	82/79	96/94	84.1	39.7
	8.000	4275	83/85	84/87	88/89	99/96	89/87	83/85	82/82	84/80	97/95	85.6	43.7
	4.000	3999	83/84	84/87	87/89	97/96	88/87	82/85	81/81	83/79	96/95	84.5	41.2
4000	6.000	4300	84/85	85/87	88/90	98/96	90/88	84/86	82/82	84/81	97/96	85.7	44.3

## ESA | 135-12-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
1500	0.500	1442	62/64	66/66	73/72	66/64	59/62	64/63	67/65	53/56	72/71	60.5	10.7
	1.500	1807	66/68	68/70	73/74	72/71	63/65	68/67	67/66	57/60	74/74	62.9	11.8
	3.000	2322	72/75	72/76	74/78	79/79	71/71	71/70	72/69	66/65	80/79	68.2	16.3
2000	1.000	1958	68/70	71/72	75/76	81/79	68/69	67/68	75/73	63/64	81/79	69.1	17.0
	3.000	2494	73/76	73/76	75/77	83/82	73/73	71/72	74/73	69/67	83/82	71.2	18.8
	6.000	3266	79/81	81/84	79/82	89/86	81/80	77/78	77/77	80/73	89/87	77.3	34.2
2500	1.000	2295	72/73	74/76	77/78	83/82	74/74	70/72	76/75	73/71	84/82	71.8	20.4
	3.000	2770	76/77	77/79	76/79	86/84	76/77	73/75	77/75	75/72	87/85	74.3	22.9
	5.000	3181	78/80	80/83	79/82	89/86	80/80	76/78	77/76	79/74	88/87	76.7	32.7
	8.000	3801	82/84	83/86	83/86	88/88	92/87	81/82	80/81	83/78	94/91	82.3	36.7
3000	10.000	4208	84/86	85/88	86/89	88/89	94/89	84/85	82/83	86/80	96/93	84.5	42.6
	1.500	2769	76/78	78/80	79/81	89/86	79/79	75/77	76/75	79/76	89/86	76.2	28.2
	4.000	3442	79/81	81/84	80/83	90/87	82/82	77/80	77/77	80/76	89/88	77.9	33.2
	7.000	3954	82/84	83/86	83/86	89/88	88/86	81/83	80/80	83/78	96/91	80.3	35.4
3500	9.000	2769	84/86	85/88	86/88	88/89	94/89	83/85	82/83	85/80	96/93	84.0	41.3
	2.000	3222	79/82	82/85	81/84	91/88	84/84	79/82	78/78	80/77	91/90	79.2	34.1
	4.000	3586	82/84	83/86	83/85	90/88	87/85	80/84	79/80	81/78	97/91	80.1	33.6
	6.000	3896	83/85	84/87	84/87	88/88	93/89	82/85	80/81	84/80	95/93	83.1	38.4
4250	8.000	4191	84/86	85/88	86/89	88/89	94/90	84/86	82/83	86/81	96/94	84.4	42.3
	3.000	3921	83/87	85/88	86/89	90/90	95/91	84/88	82/83	83/80	97/95	85.1	42.9
	5.000	4230	86/88	86/89	88/90	89/90	97/92	85/89	83/84	85/81	98/95	86.3	46.5

The sound power level ratings shown are in decibels referred to 10<sup>-12</sup> watts calculated per AMCA International Standard 301. dBA levels are not licensed by AMCA International. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWI and LWiA, and outlet LWO and LWOA sound power levels for installation Type A: Free inlet, Free outlet.

The sound ratings shown are loudness values in fan sones at 1.5m (5 ft) in a hemispherical free field calculated per AMCA International Standard 301. Values shown are for Installation Type A: free inlet hemispherical sone levels.

# SOUND PERFORMANCE

## ESA | 150-9-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
2000	0.500	1336	64/66	68/70	74/77	67/66	63/65	68/67	66/66	57/61	74/74	62.1	11.5
	1.500	1658	67/70	69/72	79/79	72/70	66/68	68/68	68/67	59/63	76/76	64.5	13.0
	3.000	2101	70/89	72/85	82/88	84/80	71/74	73/72	72/70	66/72	83/83	71.6	18.9
2500	1.000	1794	68/71	71/73	80/82	75/73	67/70	70/70	73/74	62/66	79/79	67.4	16.2
	2.000	1990	69/72	72/75	83/84	79/75	70/72	72/72	73/72	64/67	81/80	69.5	17.6
	4.000	2464	73/85	76/84	83/87	86/86	75/77	75/76	75/74	72/73	86/87	74.1	22.4
3250	6.000	2928	76/86	80/86	82/87	89/89	79/81	78/79	79/77	77/76	89/89	77.2	27.3
	1.000	2092	72/74	76/77	84/87	80/79	73/75	74/75	81/79	71/73	85/85	73.3	23.8
	2.000	2320	73/76	76/78	85/87	84/82	75/77	75/75	78/78	73/73	86/85	73.9	23.5
	4.000	2702	75/79	79/81	82/84	89/88	78/80	77/77	78/77	76/75	89/88	76.4	25.7
	6.000	3065	78/84	82/86	82/86	92/92	80/82	79/80	80/78	79/77	91/91	79.1	34.9
4000	8.000	3427	81/85	84/87	83/87	94/94	82/85	81/83	82/81	82/80	96/93	81.1	35.0
	10.000	3783	83/88	84/88	86/90	97/97	85/87	83/85	83/83	85/82	95/96	83.9	40.9
	1.500	2572	76/79	80/82	83/85	88/90	79/81	77/78	80/78	80/79	90/90	76.9	35.7
	3.000	2850	77/81	81/83	83/85	91/91	80/82	78/79	80/78	81/79	90/90	79.0	31.0
	5.000	3166	80/83	84/86	82/86	93/92	81/83	79/81	80/79	82/79	92/91	80.3	33.2
4750	7.000	3465	81/86	84/87	83/88	94/94	83/85	81/83	82/81	82/80	98/93	81.4	35.5
	9.000	3760	83/88	84/88	86/90	96/96	85/87	83/85	83/82	84/82	95/96	83.7	40.5
	3.000	3201	81/84	86/87	84/87	93/93	82/85	80/83	80/79	84/81	92/93	80.8	36.3
4750	5.000	3491	83/85	85/88	85/88	96/94	84/86	82/84	81/80	85/82	0/94	83.0	39.5
	7.000	3754	85/88	85/88	87/90	97/96	85/87	83/85	83/82	85/83	96/96	84.3	42.2

## ESA | 150-12-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
2000	0.500	1291	69/70	65/67	78/75	65/65	64/66	67/73	65/71	54/61	74/77	62.2	11.3
	1.500	1603	73/72	69/70	81/78	73/70	67/68	67/72	66/72	58/66	76/78	65.0	13.5
	3.000	2076	70/74	77/76	77/78	87/82	72/73	73/75	72/77	65/72	85/84	73.5	20.3
2500	1.000	1676	73/75	72/72	84/80	76/74	68/70	70/73	72/80	60/67	80/83	68.4	16.5
	2.000	1923	69/72	77/76	77/78	85/81	70/72	72/74	71/78	62/69	83/83	71.9	18.6
	4.000	2416	73/77	79/79	77/80	90/85	75/77	75/77	75/80	71/75	89/87	76.2	24.0
3000	1.000	1905	72/74	77/78	78/78	86/82	72/74	74/75	77/83	66/71	85/86	73.4	20.7
	4.000	2530	75/79	80/80	78/80	90/86	76/78	76/78	76/82	73/77	90/88	76.8	25.3
	8.000	3382	91/84	83/87	83/87	95/90	86/86	81/84	81/84	81/86	95/93	82.3	37.0
3500	2.000	2354	74/78	80/81	78/80	90/87	76/78	76/78	78/84	74/80	90/89	77.0	25.7
	4.000	2705	77/80	80/82	79/82	91/87	78/80	77/79	77/83	75/81	89/89	77.9	27.5
	6.000	3049	86/82	81/85	80/85	93/89	81/83	78/82	80/83	78/84	92/91	80.1	31.8
	8.000	3412	91/85	83/87	83/87	95/91	86/86	81/85	81/84	81/86	96/93	82.5	37.5
	10.000	3783	95/87	84/89	86/90	92/91	97/92	83/88	83/86	84/89	98/96	86.5	47.6
4000	1.500	2484	77/80	81/83	80/82	90/87	78/80	77/80	78/84	78/83	91/90	77.7	27.7
	4.000	2909	80/82	81/84	81/84	92/89	80/82	78/81	78/82	79/85	91/91	79.2	30.5
	7.000	3357	91/84	83/87	82/87	95/90	85/85	80/84	81/84	81/86	97/93	82.1	36.6
	10.000	3826	95/87	84/89	86/90	92/91	97/92	84/88	83/86	84/90	98/96	86.8	48.4
4750	2.000	2929	79/83	82/85	82/85	93/91	82/85	80/83	79/82	81/85	92/92	80.5	32.7
	5.000	3372	87/86	84/87	84/87	94/91	86/87	81/85	80/83	82/87	99/94	81.9	36.1
	8.000	3750	93/87	84/88	86/89	92/91	96/92	83/88	82/85	84/89	98/96	86.1	46.2

The sound power level ratings shown are in decibels referred to 10<sup>-12</sup> watts calculated per AMCA International Standard 301. dBA levels are not licensed by AMCA International. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWi and LWiA, and outlet LWo and LWoA sound power levels for installation Type A: Free inlet, Free outlet.

The sound ratings shown are loudness values in fan sones at 1.5m (5 ft) in a hemispherical free field calculated per AMCA International Standard 301. Values shown are for Installation Type A: free inlet hemispherical sone levels.

# SOUND PERFORMANCE

## ESA | 165-9-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
1500	1.000	1135	66/67	75/78	69/73	60/65	60/65	61/65	54/60	50/54	67/72	55.6	7.8
	1.500	1341	71/70	82/73	75/82	66/70	62/68	62/67	57/66	54/56	72/77	60.3	11.2
3000	1.000	1584	70/73	75/76	82/87	73/77	68/72	71/73	72/73	62/65	79/82	67.5	16.2
	2.000	1829	73/75	76/78	86/89	76/80	70/75	72/75	73/75	65/69	82/85	69.8	18.3
	3.000	2054	76/77	78/80	88/90	79/82	72/77	73/76	73/75	67/70	84/86	71.4	20.3
	4.000	2270	77/78	80/82	89/92	82/84	74/78	74/76	74/76	69/71	85/87	73.1	22.2
	6.000	2682	79/83	83/85	86/91	92/93	80/80	77/78	77/76	74/73	91/92	79.2	29.6
4000	1.500	2056	76/78	78/81	87/91	80/83	74/78	75/76	77/77	73/73	85/87	72.7	22.3
	2.500	2249	77/79	80/82	90/92	83/85	75/80	75/77	76/77	74/74	86/88	74.2	24.0
	4.000	2515	79/80	82/84	86/88	92/93	78/81	76/78	76/77	75/74	90/91	78.8	29.0
	6.000	2847	81/82	84/86	85/88	94/96	81/82	78/80	78/78	76/75	98/94	80.4	31.9
	8.000	3167	83/86	86/88	86/90	97/98	84/85	80/83	80/80	78/78	95/96	83.4	38.0
5000	10.000	3475	86/90	88/90	87/91	99/100	86/88	82/85	82/82	81/80	97/98	85.2	42.9
	2.000	2513	79/81	82/85	86/88	91/94	80/83	77/80	78/78	79/77	90/92	78.6	37.8
	4.000	2825	82/84	85/87	85/88	95/95	83/84	78/81	78/78	79/77	100/94	81.9	38.8
	7.000	3245	85/87	87/88	87/90	98/99	85/86	81/84	81/81	80/80	96/97	84.3	40.6
	9.000	3510	86/88	88/89	88/91	99/100	87/88	82/85	82/83	82/81	97/98	85.3	43.4
6000	2.500	2961	83/85	86/88	87/89	96/97	84/87	80/84	80/80	83/81	0/96	82.6	37.6
	4.000	3167	84/87	87/89	87/90	97/98	86/88	81/85	81/81	83/81	96/97	84.1	40.7
	7.000	3540	87/90	89/90	89/91	100/100	88/89	83/87	83/83	83/83	98/99	86.9	47.9
6500	3.000	3217	85/87	87/90	88/91	97/99	87/89	82/86	82/82	84/82	96/98	84.3	41.8
	5.000	3468	87/89	89/91	89/92	99/100	88/90	83/88	83/83	84/83	98/99	86.0	46.2

## ESA | 135-12-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
2000	1.000	1235	67/71	69/70	76/77	65/68	66/66	64/64	58/58	56/56	72/73	60.1	10.1
	2.000	1560	71/75	73/75	79/81	71/74	69/71	69/69	65/64	62/62	76/78	64.7	13.5
3000	1.000	1572	71/75	74/75	82/83	74/77	71/73	73/73	68/68	63/62	79/80	67.9	15.9
	2.000	1799	74/78	76/78	82/83	79/81	72/75	74/74	70/70	66/65	81/82	69.4	17.4
	3.000	2013	76/78	78/81	80/83	84/85	74/77	75/75	72/72	69/67	84/85	72.2	20.2
4000	5.000	2450	78/81	81/85	80/84	89/89	77/80	78/79	77/76	74/73	88/88	76.2	25.4
	1.000	1935	76/78	78/80	82/84	86/86	75/78	78/78	76/75	71/69	87/87	74.5	22.9
	2.500	2224	78/80	81/83	81/83	88/89	76/80	78/78	77/76	73/71	89/88	75.6	24.6
	4.000	2470	79/82	82/85	81/84	89/90	78/81	79/80	78/77	75/73	88/89	76.6	26.3
	7.000	2956	82/86	85/88	83/88	91/92	82/84	81/83	82/81	79/78	97/92	79.4	38.3
5000	9.000	3285	83/88	87/90	85/90	95/95	85/87	83/85	84/83	81/80	94/95	82.6	37.9
	1.500	2407	81/82	83/85	83/85	90/91	79/83	80/82	81/80	79/76	90/91	78.5	35.3
	2.500	2578	82/84	84/87	83/86	90/92	80/84	80/82	81/80	80/77	90/92	78.7	37.7
	4.000	2793	84/87	86/88	83/87	91/93	81/85	81/83	81/80	80/77	98/93	79.4	36.4
	6.000	3055	84/88	86/89	85/88	93/94	84/86	82/85	83/82	81/79	93/94	81.1	35.3
6000	9.000	3442	86/90	89/91	87/91	95/95	88/89	84/87	85/85	84/82	95/96	83.4	41.1
	2.000	2862	85/87	87/89	86/88	92/93	84/87	83/86	84/83	84/81	97/94	81.0	39.1
	3.000	3013	86/88	87/89	87/89	92/94	85/88	83/87	84/83	84/81	101/95	81.5	40.0
	5.000	3265	88/91	89/91	88/90	95/96	87/90	84/88	84/84	85/82	95/96	83.2	42.3
7000	7.000	3489	88/93	90/92	89/92	95/97	90/92	85/89	86/86	85/83	96/98	84.3	45.0
	2.500	3527	88/91	89/92	90/92	96/97	89/92	86/90	87/86	88/85	96/98	84.9	49.9
	4.000	3307	87/89	89/91	90/92	99/101	89/91	84/89	83/84	85/84	98/99	86.1	47.0

The sound power level ratings shown are in decibels referred to 10<sup>-12</sup> watts calculated per AMCA International Standard 301. dBA levels are not licensed by AMCA International. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWI and LWiA, and outlet LWO and LWOA sound power levels for installation Type A: Free inlet, Free outlet.

The sound ratings shown are loudness values in fan sones at 1.5m (5 ft) in a hemispherical free field calculated per AMCA International Standard 301. Values shown are for Installation Type A: free inlet hemispherical sone levels.

# SOUND PERFORMANCE

## ESA | 182-9-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
3000	1.000	1246	70/76	79/79	87/80	68/76	66/72	66/71	66/71	65/70	80/79	68.4	16.8
	3.000	1731	76/83	81/85	94/86	76/85	75/80	74/80	74/78	72/79	87/88	75.3	25.4
3500	1.000	1375	72/77	76/80	91/86	70/76	68/73	66/71	69/70	70/69	83/81	71.8	19.9
	2.000	1587	74/81	79/83	92/85	74/83	73/77	72/78	72/77	70/76	85/86	73.4	22.6
4500	5.000	2209	81/87	83/89	99/92	86/90	80/87	79/85	79/84	77/84	92/93	80.9	35.8
	1.000	1648	76/81	79/83	92/90	75/81	73/77	71/73	75/73	77/72	86/85	74.2	24.2
	2.000	1828	77/83	80/85	97/91	78/84	75/80	74/79	75/77	74/78	89/88	77.5	28.6
	5.000	2313	82/87	84/89	100/94	90/91	81/89	80/86	80/85	79/85	94/95	82.3	39.2
5000	8.000	2798	87/91	87/93	93/95	104/97	86/95	85/90	84/90	84/89	102/100	90.3	56.7
	1.500	1877	78/83	80/86	97/93	79/84	75/80	73/77	76/76	78/77	90/89	78.0	30.0
	4.000	2256	81/87	83/89	100/93	88/90	80/88	80/85	80/84	78/85	93/94	81.5	37.1
	6.000	2545	84/89	85/91	93/94	102/95	83/93	82/88	82/87	81/87	100/97	88.1	49.2
	8.000	2836	87/91	87/94	93/96	105/97	86/95	85/90	85/90	84/89	102/100	90.6	58.0
	10.000	3127	90/93	89/96	94/98	107/99	89/98	87/92	87/92	86/91	104/102	92.9	67.7
5500	1.500	2016	80/84	82/87	97/94	82/86	77/82	75/79	77/77	81/77	90/90	78.6	31.8
	3.000	2236	81/86	83/88	101/95	87/89	80/86	78/84	79/82	79/82	94/93	82.1	38.6
	6.000	2633	85/90	86/92	92/94	103/95	84/94	83/88	83/88	82/88	100/98	88.9	51.6
	8.000	2897	88/91	87/94	93/96	105/98	87/96	85/90	85/91	84/90	103/100	91.2	60.0
8000	11.000	3295	88/91	87/94	93/96	105/98	87/96	85/90	85/91	84/90	103/100	91.2	60.0
	3.000	2913	89/91	89/94	92/96	105/102	87/93	85/89	83/85	87/85	102/101	90.6	59.0
	5.000	3121	90/93	90/94	93/97	109/104	88/94	86/91	84/89	87/88	106/103	94.5	72.2
	6.000	3219	91/94	90/95	94/98	109/103	89/96	87/92	85/91	87/89	106/103	94.8	74.7

## ESA | 182-12-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
3000	1.000	1191	68/74	70/78	76/77	67/70	66/69	65/64	64/61	62/57	73/74	61.8	11.8
	2.000	1448	72/77	72/79	80/81	72/74	72/73	74/69	70/65	66/61	79/78	67.8	16.3
	3.000	1731	76/83	81/85	94/86	76/85	75/80	74/80	74/78	72/79	87/88	75.3	25.4
3500	1.000	1308	70/76	73/79	78/80	69/73	68/72	66/67	68/64	68/60	76/77	64.1	14.5
	2.000	1528	73/78	73/81	81/82	73/76	73/75	75/71	72/67	68/63	81/80	69.0	17.5
	4.000	1983	78/82	79/85	83/86	85/87	78/80	80/79	79/74	75/70	87/87	75.8	26.0
4000	1.000	1431	73/78	75/80	81/83	71/76	70/74	68/70	70/67	71/64	78/80	66.8	17.4
	3.000	1821	77/81	77/84	82/84	84/85	76/78	79/76	77/72	72/68	85/85	73.9	23.0
	5.000	2221	80/83	81/88	83/88	89/90	81/83	82/81	83/77	78/73	90/90	78.5	30.7
5000	1.000	1688	77/81	78/85	86/86	79/81	74/79	72/75	74/72	76/69	83/85	71.7	23.2
	2.000	1862	78/82	79/85	83/86	85/87	76/80	75/77	75/73	75/70	85/87	73.7	23.5
	4.000	2171	80/83	81/87	83/88	88/89	80/82	81/81	82/77	77/73	89/90	77.8	29.4
	6.000	2483	83/85	84/90	84/91	92/92	83/86	84/85	86/81	81/76	93/93	81.1	36.6
	9.000	2968	86/88	87/93	88/95	96/96	87/90	87/89	89/85	86/81	97/97	85.2	47.5
6000	1.500	2035	81/84	81/87	84/89	90/90	78/84	77/81	77/77	80/74	89/90	77.4	34.4
	3.000	2250	82/84	82/88	85/91	90/92	80/85	79/83	78/78	79/75	90/92	78.4	36.6
	5.000	2509	83/85	84/90	85/93	92/93	83/86	83/85	84/81	81/77	92/94	80.8	34.9
	7.000	2764	85/87	86/92	86/93	94/95	86/88	86/87	88/83	84/79	95/95	83.4	42.6
	10.000	3163	88/89	89/94	89/97	97/97	89/92	88/90	91/87	88/83	98/99	86.4	52.7
8000	3.000	2752	89/89	87/92	89/95	97/97	85/90	84/89	82/84	85/81	96/98	84.0	43.2
	6.000	3067	89/90	89/94	91/98	97/98	89/92	86/90	85/86	86/83	96/99	85.0	46.3
	8.000	3260	89/90	90/94	91/99	97/99	91/93	88/91	88/88	87/84	98/100	86.5	51.7

The sound power level ratings shown are in decibels referred to 10<sup>-12</sup> watts calculated per AMCA International Standard 301. dBA levels are not licensed by AMCA International. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWI and LWiA, and outlet LWo and LWoA sound power levels for installation Type A: Free inlet, Free outlet.

The sound ratings shown are loudness values in fan sones at 1.5m (5 ft) in a hemispherical free field calculated per AMCA International Standard 301. Values shown are for Installation Type A: free inlet hemispherical sone levels.

# SOUND PERFORMANCE

## ESA | 200-9-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
3500	1.000	1113	68/74	84/80	74/74	66/69	64/68	63/66	63/61	63/57	73/74	61.8	13.0
	3.000	1567	75/80	78/80	94/87	78/78	76/76	78/75	72/70	68/65	88/83	76.1	25.7
4500	1.000	1308	72/77	81/80	87/83	72/75	69/72	66/71	69/66	71/64	80/79	68.8	18.2
	3.000	1669	76/81	78/81	95/88	80/80	77/77	80/77	74/72	69/67	89/84	77.3	27.6
	5.000	2022	80/83	81/86	100/93	86/85	82/81	84/81	80/78	75/73	93/89	81.8	36.8
5500	1.000	1516	76/80	80/82	87/86	77/80	73/77	70/75	72/71	76/70	83/83	71.4	22.6
	3.000	1827	78/82	79/84	95/91	81/82	77/79	76/79	75/75	73/71	88/87	76.9	27.9
	5.000	2115	81/84	82/87	100/94	88/86	83/82	85/82	81/79	76/74	94/90	82.8	39.2
	7.000	2404	83/86	84/89	98/94	96/91	87/86	87/85	85/83	80/78	97/93	85.0	49.6
6500	8.000	2547	84/87	85/91	96/93	104/97	89/88	88/86	87/85	81/79	102/96	90.6	58.7
	2.000	1878	80/83	81/86	93/90	83/84	77/81	75/80	75/76	78/74	88/88	76.0	27.4
	4.000	2136	81/84	82/88	98/94	87/87	80/83	79/82	78/80	77/75	92/91	80.4	34.4
	6.000	2380	83/86	84/89	98/94	95/91	87/85	87/85	85/83	79/77	96/93	84.7	46.6
	8.000	2624	85/88	86/91	95/93	105/98	89/89	89/87	88/85	82/80	103/97	91.2	61.2
	10.000	2868	87/90	88/93	93/94	107/100	92/91	90/89	90/88	84/82	105/99	93.3	70.1
9000	12.000	3109	88/92	90/94	93/95	106/100	93/93	91/90	93/90	87/85	104/100	92.5	69.4
	3.000	2515	86/87	87/92	96/95	100/98	86/89	83/87	81/85	84/81	98/97	86.4	47.1
	5.000	2714	87/88	88/93	94/94	103/99	88/91	84/88	82/86	84/82	101/98	89.3	54.3
	7.000	2898	87/90	88/94	92/95	105/101	89/92	86/89	84/88	84/83	102/100	90.7	58.8
11000	9.000	3075	88/91	89/94	93/95	104/100	92/93	89/90	88/90	86/85	102/100	90.8	61.8
	4.000	3031	89/91	91/95	95/97	103/101	92/95	88/92	86/90	88/86	101/101	89.5	58.5
	5.000	3118	90/92	91/96	95/97	106/103	92/95	88/92	86/90	88/86	104/103	92.2	66.9

## ESA | 200-12-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
3000	1.000	990	69/72	75/72	79/75	64/68	63/68	62/65	60/59	58/54	73/73	61.3	11.5
	2.000	1278	78/79	80/77	85/80	73/75	72/74	71/72	69/67	67/61	80/79	68.4	17.8
4000	1.000	1163	73/76	75/75	83/80	69/73	67/72	65/70	67/66	68/62	77/78	65.6	15.0
	2.000	1366	76/79	80/78	86/82	74/77	71/75	70/74	69/69	66/64	81/81	69.0	18.2
5000	4.000	1803	84/84	86/86	91/87	87/84	80/81	80/81	78/77	76/71	89/88	77.2	28.4
	1.000	1356	76/80	80/79	86/83	74/77	71/76	69/74	71/70	74/69	81/82	69.6	20.6
	4.000	1855	82/83	84/86	90/86	92/88	79/81	78/82	77/78	74/73	91/89	79.3	30.6
7000	6.000	2209	86/87	90/90	93/90	96/92	84/86	84/86	83/83	81/77	95/93	83.9	41.6
	2.000	1903	83/84	83/88	90/88	93/90	79/84	77/83	76/80	80/77	91/91	79.7	34.9
	4.000	2144	84/85	86/89	89/89	96/92	81/85	80/85	78/83	79/78	94/93	82.2	36.7
	5.000	2259	84/86	87/90	91/89	94/91	83/86	81/86	80/84	79/79	93/93	81.8	37.7
	6.000	2376	85/87	88/91	93/90	99/94	84/88	83/87	81/85	80/80	97/95	85.1	44.4
	8.000	2617	88/90	92/93	95/93	100/96	88/91	86/89	85/88	83/82	99/97	87.2	50.8
	10.000	2869	90/93	94/95	96/95	101/97	91/93	89/91	88/90	87/85	100/99	88.6	57.1
9000	12.000	3123	92/96	98/97	98/97	105/100	95/95	91/93	92/93	90/87	104/101	92.2	72.4
	3.000	2416	88/89	88/93	93/92	98/96	85/90	83/89	81/86	84/83	97/97	85.2	44.7
	5.000	2610	89/90	90/93	92/93	100/97	87/91	85/90	82/88	84/83	98/98	86.6	48.3
	6.000	2701	89/90	91/93	91/93	101/97	88/91	85/90	83/89	84/84	99/98	87.5	50.7
11000	8.000	2881	89/92	92/94	94/94	103/99	90/93	87/91	86/90	85/85	101/100	89.7	57.8
	10.000	3062	90/93	93/96	95/95	104/99	92/95	89/92	88/92	86/87	102/101	91.0	63.8
	4.000	2912	92/93	93/96	94/96	103/101	92/95	88/93	86/92	87/87	101/101	89.7	59.7
6.000	3077	93/94	94/97	94/96	104/101	93/95	89/94	87/93	87/88	102/102	90.8	63.7	

The sound power level ratings shown are in decibels referred to 10<sup>-12</sup> watts calculated per AMCA International Standard 301. dBA levels are not licensed by AMCA International. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWI and LWiA, and outlet LWO and LWOA sound power levels for installation Type A: Free inlet, Free outlet.

The sound ratings shown are loudness values in fan sones at 1.5m (5 ft) in a hemispherical free field calculated per AMCA International Standard 301. Values shown are for Installation Type A: free inlet hemispherical sone levels.

# SOUND PERFORMANCE

## ESA | 222-9-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
4000	1.000	953	64/68	73/74	64/70	66/68	65/64	63/61	59/58	54/55	70/70	58.6	9.0
	2.500	1283	68/75	76/78	78/81	71/74	74/72	71/69	68/66	64/63	78/78	66.9	14.9
5000	4.000	1597	73/80	77/80	84/87	76/80	79/78	77/74	74/72	70/68	84/84	72.2	20.5
	1.000	1088	67/72	80/80	70/74	69/72	69/68	68/65	64/62	60/60	74/74	62.8	12.1
	2.000	1269	69/74	76/78	81/82	70/75	73/72	70/68	67/65	62/62	78/78	66.6	14.8
	3.000	1445	70/77	76/78	82/84	73/78	76/75	74/71	71/69	66/66	81/81	69.5	17.3
	6.000	1956	78/84	79/84	87/89	82/84	82/83	82/79	80/77	76/74	88/88	76.6	27.1
6000	1.000	1233	70/75	78/79	77/79	71/76	73/72	71/68	69/66	64/63	78/78	66.3	14.9
	1.500	1316	71/76	76/78	84/84	72/78	74/73	72/69	70/67	65/64	80/80	68.5	16.8
	2.500	1467	72/77	75/78	85/85	73/79	76/76	74/72	71/69	66/66	82/82	70.3	18.3
	4.000	1687	74/80	77/81	86/88	76/81	79/80	77/75	75/73	71/70	85/85	73.0	21.5
	6.000	1979	78/84	80/85	89/91	82/85	82/83	82/80	80/78	76/74	89/89	77.2	27.9
8000	9.000	2395	82/89	83/89	91/93	88/91	85/88	87/85	85/82	81/79	93/93	81.4	37.0
	1.500	1608	77/80	77/81	89/90	77/83	79/80	77/75	77/74	72/71	86/86	74.2	23.4
	2.000	1673	77/81	77/81	89/90	78/83	80/81	77/76	77/74	72/71	86/87	74.3	23.6
	3.000	1793	78/82	78/82	90/90	78/84	81/82	79/77	78/75	73/72	87/88	75.5	25.1
	5.000	2018	78/83	80/84	92/92	81/86	82/84	82/80	80/77	75/75	89/90	77.4	28.1
	7.000	2237	80/86	82/87	92/94	84/88	84/86	84/83	82/80	79/77	91/92	79.5	33.5
12000	10.000	2566	84/91	84/90	91/93	93/96	86/89	89/87	86/84	83/81	95/96	83.8	41.8
	2.500	2331	85/87	84/89	97/98	90/93	86/90	87/86	87/84	84/81	95/96	83.3	43.0
	4.000	2467	86/88	85/90	92/94	92/94	86/91	88/87	86/83	84/81	95/96	83.1	41.8
	6.000	2631	86/89	86/91	90/93	99/99	87/93	89/89	87/84	85/82	98/99	86.4	48.0

## ESA | 222-12-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
4000	1.000	924	69/77	73/77	78/78	63/73	64/70	62/65	58/63	55/59	72/76	60.5	10.7
	2.000	1156	76/84	80/84	84/85	70/78	71/77	69/74	65/71	62/67	78/83	66.9	16.0
5000	2.500	1280	80/88	85/89	88/88	75/81	74/80	73/77	69/74	65/70	82/86	70.7	20.1
	1.000	1057	73/79	74/79	81/83	68/76	67/73	64/68	61/65	59/62	75/79	63.7	13.0
	2.500	1324	78/85	79/87	86/87	73/81	72/80	72/77	69/74	65/70	81/85	69.1	18.1
6000	4.000	1618	85/86	88/96	94/93	82/88	79/85	79/83	76/81	71/77	88/92	76.7	28.7
	1.000	1201	76/82	78/83	85/86	71/79	71/77	68/71	65/68	63/65	79/83	67.8	16.6
	2.000	1350	78/84	78/86	87/88	73/81	72/80	71/76	68/72	65/69	81/85	69.3	18.3
	3.000	1497	81/87	80/89	89/90	75/83	74/83	74/80	72/76	68/73	83/88	71.8	21.3
8000	6.000	1981	90/90	92/101	99/97	93/96	83/90	84/89	81/86	77/83	94/97	82.9	40.4
	1.000	1502	82/87	83/89	92/92	78/85	76/84	75/78	72/75	69/71	86/89	74.2	24.5
	2.000	1628	84/89	84/89	92/93	80/87	77/85	76/80	73/76	70/73	86/90	74.4	24.9
	3.000	1740	85/90	84/90	92/93	84/89	77/86	78/83	74/78	72/75	87/92	75.6	26.5
	5.000	1958	89/93	84/94	87/93	94/94	79/89	81/87	79/83	75/80	92/95	80.8	33.5
	7.000	2189	92/94	89/98	92/97	96/98	83/92	84/90	82/87	78/84	95/99	83.6	40.7
10000	10.000	2560	96/96	95/103	100/104	103/103	90/96	89/95	88/92	84/90	101/104	89.8	61.2
	2.000	1925	88/93	87/93	90/93	96/96	82/90	81/86	78/80	75/77	94/96	82.4	36.5
	3.000	2023	89/94	88/94	89/94	96/97	83/91	82/87	79/82	76/79	94/97	82.6	37.4
	7.000	2376	93/97	89/97	90/98	99/99	84/93	85/92	84/88	80/85	97/100	85.6	47.0
12000	10.000	2648	96/99	93/100	94/102	101/102	88/96	87/95	87/92	84/89	99/103	87.9	54.4
	2.500	2276	92/96	91/97	92/97	101/101	86/94	85/91	83/85	80/82	99/101	87.4	51.9
	7.000	2628	95/99	93/99	93/100	101/102	88/96	87/94	85/89	82/86	99/103	87.8	52.8

The sound power level ratings shown are in decibels referred to 10<sup>-12</sup> watts calculated per AMCA International Standard 301. dBA levels are not licensed by AMCA International. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWi and LWiA, and outlet LWo and LWoA sound power levels for installation Type A: Free inlet, Free outlet.

The sound ratings shown are loudness values in fan sones at 1.5m (5 ft) in a hemispherical free field calculated per AMCA International Standard 301. Values shown are for Installation Type A: free inlet hemispherical sone levels.



# SOUND PERFORMANCE

## ESA | 245-9-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
5000	1.000	878	66/71	75/76	67/72	68/70	67/66	66/63	62/61	58/58	72/73	60.8	10.5
	2.500	1176	70/77	76/78	80/82	73/77	76/74	73/70	70/68	66/65	80/80	68.7	16.5
	3.500	1367	73/80	77/80	83/85	77/80	79/78	77/74	74/72	70/69	84/84	72.4	20.6
6000	1.000	977	69/74	81/81	72/76	70/74	70/70	69/66	66/64	62/61	76/76	64.3	13.3
	2.000	1148	70/76	75/78	81/82	72/77	74/74	72/70	69/67	64/64	79/80	67.7	15.5
	3.000	1313	72/79	76/79	85/86	74/80	78/77	76/73	73/71	68/67	83/83	71.3	19.2
7500	5.000	1634	77/84	79/84	88/91	81/84	82/83	82/79	79/77	75/73	88/88	76.6	26.9
	1.000	1137	72/77	77/79	82/83	73/79	75/74	73/71	72/69	67/66	81/81	69.2	17.7
	1.500	1212	73/78	75/79	86/86	74/80	76/76	74/72	72/70	68/67	82/83	70.6	18.9
	2.500	1351	74/79	76/80	88/88	75/81	78/78	76/74	74/72	69/68	84/85	72.5	21.1
	3.500	1484	75/81	78/81	88/88	77/83	80/81	78/76	76/74	71/71	85/86	73.9	22.6
8500	5.000	1682	78/84	80/84	90/92	81/85	82/84	82/80	80/77	75/74	89/89	77.0	27.6
	7.000	1941	81/87	82/88	91/94	86/89	85/87	86/84	84/81	80/78	92/92	80.6	40.0
	1.000	1248	75/79	77/80	87/88	76/82	78/77	76/74	76/73	70/69	84/84	72.7	21.4
	2.000	1384	76/80	77/81	86/87	77/83	79/80	77/75	76/73	71/70	84/85	72.8	21.7
	3.000	1506	77/81	78/82	90/90	78/84	81/82	78/77	77/75	72/71	86/87	74.9	24.3
	4.000	1625	78/82	79/83	91/91	79/85	82/83	80/79	78/76	74/73	88/89	76.3	26.3
13000	6.000	1857	80/86	81/87	91/93	84/88	84/86	84/83	82/80	78/77	91/91	79.0	31.8
	9.000	2200	84/91	84/91	91/93	91/94	87/90	89/87	87/84	83/81	95/96	83.6	42.4
	2.500	1924	84/87	84/89	96/97	88/92	86/89	86/85	86/83	82/80	94/95	82.3	40.1
	3.500	2015	85/87	85/89	97/97	89/93	86/90	86/86	85/83	82/81	94/95	82.7	40.1
13000	5.000	2143	85/88	85/90	92/94	93/95	87/91	88/87	86/84	83/82	95/96	83.3	41.7
	6.000	2224	86/89	86/91	91/93	95/96	87/92	89/88	86/84	84/82	96/97	84.4	43.5

## ESA | 245-12-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
5000	1.000	845	68/75	76/77	66/72	61/71	62/67	59/63	56/60	53/57	68/73	56.1	8.5
	2.000	1048	73/82	77/81	80/81	67/76	68/74	66/71	62/68	59/64	75/80	63.7	13.1
	2.500	1155	76/85	81/85	84/85	71/78	71/77	69/74	65/71	62/67	79/83	67.3	16.4
6000	1.000	940	71/77	73/77	78/80	65/74	65/70	61/65	58/62	56/59	72/76	60.8	11.0
	2.500	1191	73/83	77/84	84/85	70/79	70/77	69/74	66/71	62/67	78/83	66.9	15.7
	4.000	1458	82/86	86/93	91/91	78/85	76/83	76/80	73/78	68/74	85/89	73.7	24.0
7000	1.000	1041	73/79	75/79	82/83	68/76	68/73	64/67	61/65	59/61	76/79	64.0	13.3
	2.000	1189	72/81	76/83	84/85	69/78	70/77	68/72	65/69	62/66	78/82	66.5	15.3
	3.000	1331	74/83	78/87	86/87	72/81	72/80	72/76	69/73	65/70	81/85	69.0	17.8
	5.000	1633	84/86	86/94	92/93	82/88	78/85	78/83	75/80	71/77	87/92	75.6	26.8
8000	1.000	1145	75/81	77/82	85/86	70/78	70/76	67/70	64/67	62/63	79/82	67.3	16.0
	2.000	1282	74/81	78/84	85/87	72/80	71/79	70/74	66/70	64/67	80/84	68.1	16.9
	3.000	1406	76/83	79/87	88/89	73/82	73/81	73/77	70/74	66/71	82/86	70.6	19.5
	5.000	1661	83/86	84/93	91/92	81/87	77/86	78/83	75/80	71/76	86/91	74.8	25.4
	7.000	1929	89/89	90/99	96/96	92/95	82/89	83/88	80/85	76/82	93/96	81.4	35.8
9000	1.000	1252	76/82	79/85	87/87	73/80	72/79	70/73	67/70	65/66	81/84	69.5	18.4
	2.500	1439	76/83	80/87	89/90	75/83	73/81	73/77	69/73	67/70	83/87	71.0	20.1
	4.000	1604	80/86	81/90	90/91	78/85	75/84	76/81	74/78	70/74	85/90	73.2	23.1
	6.000	1830	85/88	85/94	90/93	92/93	79/88	80/86	78/82	74/79	91/94	79.4	31.1
	9.000	2187	92/92	92/100	97/99	96/98	85/92	86/91	83/88	79/85	96/100	84.7	47.4
15000	3.000	2105	90/91	89/95	91/95	98/99	84/92	83/89	80/83	77/80	96/98	84.5	41.5
	5.000	2261	89/93	89/95	91/96	99/100	85/93	84/90	81/85	78/82	97/100	85.7	44.1

The sound power level ratings shown are in decibels referred to 10<sup>-12</sup> watts calculated per AMCA International Standard 301. dBA levels are not licensed by AMCA International. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWI and LWiA, and outlet LWO and LWOA sound power levels for installation Type A: Free inlet, Free outlet.

The sound ratings shown are loudness values in fan sones at 1.5m (5 ft) in a hemispherical free field calculated per AMCA International Standard 301. Values shown are for Installation Type A: free inlet hemispherical sone levels.



# SOUND PERFORMANCE

## ESA | 270-9-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
5000	1.000	740	73/78	83/86	70/72	64/68	63/66	63/70	63/72	58/59	72/77	60.3	12.0
	1.500	852	80/83	85/88	76/76	68/73	67/68	66/73	66/75	61/63	76/80	64.1	15.0
6500	1.000	840	71/78	86/89	73/75	66/72	64/67	65/73	66/75	62/62	75/80	63.3	14.4
	2.000	1016	80/84	89/92	81/83	73/77	70/72	70/76	70/79	65/68	80/84	68.2	18.9
	3.000	1185	90/92	92/95	89/90	79/82	75/77	75/79	74/83	69/74	85/89	73.6	25.0
8000	1.000	953	74/80	86/88	78/79	71/76	68/70	68/75	70/78	66/65	78/82	66.1	16.4
	2.000	1105	78/82	91/94	83/86	75/79	70/73	71/78	73/83	68/70	81/87	70.0	20.9
	3.000	1247	84/88	90/93	93/96	80/83	75/78	75/79	75/83	72/78	87/91	75.3	27.0
	5.000	1519	96/98	98/99	98/99	88/89	82/85	81/82	79/86	78/87	93/95	81.0	39.4
9000	1.000	1034	76/81	91/92	82/82	73/78	70/72	71/76	72/80	68/67	81/85	69.3	20.3
	2.500	1239	80/85	88/92	94/96	79/82	73/77	73/79	75/83	72/78	87/91	75.5	26.7
	3.500	1365	85/89	89/93	96/98	83/85	77/81	76/80	76/84	75/86	89/93	77.6	30.7
	6.000	1670	97/99	98/100	100/102	91/92	84/88	83/84	81/88	80/89	95/98	83.5	45.7
12000	1.500	1347	83/87	86/91	97/97	83/85	77/81	77/80	77/84	77/84	90/92	78.7	32.2
	3.000	1509	84/89	86/91	96/99	86/87	79/84	78/81	78/86	79/87	90/94	78.9	33.5
	4.000	1608	85/90	86/93	100/103	87/89	80/86	78/82	79/87	80/88	93/97	81.7	40.7
	6.000	1800	91/95	91/97	102/105	91/92	84/89	82/84	82/89	83/93	96/100	84.3	46.1
	9.000	2077	99/102	100/102	105/107	99/99	90/94	87/88	86/92	86/95	100/103	88.7	61.5
16000	2.500	1781	89/94	89/95	103/104	92/92	84/89	83/84	82/89	84/93	97/99	85.3	48.9
	4.000	1907	90/95	89/95	101/103	94/94	86/91	83/85	83/90	85/93	96/99	84.8	47.0
	5.000	1986	90/95	90/95	105/107	95/96	87/92	84/86	84/91	86/94	99/102	87.2	54.8
	7.000	2136	91/97	91/96	106/109	97/100	89/93	84/87	85/92	87/96	100/104	88.4	58.9
	6.000	2224	86/89	86/91	91/93	95/96	87/92	89/88	86/84	84/82	96/97	84.4	43.5

## ESA | 270-12-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
5000	1.000	794	67/72	82/81	68/72	64/69	65/69	63/71	62/70	61/61	72/77	60.4	11.6
	1.500	851	71/74	84/82	75/78	67/73	68/72	67/74	65/74	63/66	75/80	63.7	14.0
7000	1.000	872	72/76	82/82	79/80	70/75	69/72	68/74	67/74	66/64	77/81	65.2	15.2
	2.000	1035	76/80	81/83	88/87	73/79	72/76	72/78	71/79	69/70	82/85	70.7	20.1
	3.500	1286	81/84	81/85	93/91	78/84	76/81	77/82	75/84	73/79	87/90	75.1	25.8
9000	1.000	1032	78/82	82/83	91/88	75/80	74/77	73/78	72/79	72/69	84/86	72.7	22.6
	2.500	1229	81/84	81/85	93/92	78/83	76/80	76/81	75/84	73/74	87/90	75.0	25.6
	3.500	1355	83/86	81/86	92/93	80/85	78/83	78/83	77/85	75/80	87/91	75.7	26.8
	6.000	1681	87/90	85/89	98/97	89/92	82/88	83/86	82/89	80/89	93/96	81.6	41.7
11000	1.000	1200	82/87	82/85	95/92	80/84	78/81	77/81	76/84	76/73	88/90	76.7	28.7
	2.000	1320	83/87	82/86	96/94	81/85	79/83	78/82	77/84	76/78	89/91	77.8	30.4
	3.000	1426	84/88	82/87	97/96	82/86	79/84	80/83	78/85	77/83	90/93	78.8	32.2
	5.000	1632	87/90	85/89	98/98	88/91	82/87	83/86	81/88	80/88	93/96	81.3	40.9
	7.000	1844	89/93	88/91	96/98	100/98	85/91	85/88	84/91	82/91	98/99	86.7	48.4
	9.000	2059	91/95	91/94	96/98	102/100	87/94	87/91	87/93	85/94	100/102	88.9	56.3
13000	1.500	1429	86/91	85/89	99/96	85/87	81/85	81/84	79/86	80/83	92/93	80.7	39.0
	2.500	1532	87/91	85/89	99/97	86/89	82/86	82/85	80/87	81/87	93/95	81.3	38.1
	3.500	1625	87/92	85/90	99/98	89/91	83/88	83/86	81/88	81/87	94/96	82.0	39.5
	9.000	2109	92/96	91/95	96/98	103/102	88/94	88/91	87/94	86/95	101/103	89.9	59.8
17000	2.500	1864	92/97	91/95	97/97	104/101	88/93	87/90	85/91	86/92	102/101	90.1	59.8
	4.000	1983	92/97	92/96	96/97	104/102	89/94	88/91	86/92	86/93	102/102	90.7	62.7
	6.000	2125	93/97	92/96	96/98	105/104	90/95	89/92	88/93	87/94	103/104	91.5	65.8

The sound power level ratings shown are in decibels referred to 10<sup>-12</sup> watts calculated per AMCA International Standard 301. dBA levels are not licensed by AMCA International. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWI and LWiA, and outlet LWo and LWoA sound power levels for installation Type A: Free inlet, Free outlet.

The sound ratings shown are loudness values in fan sones at 1.5m (5 ft) in a hemispherical free field calculated per AMCA International Standard 301. Values shown are for Installation Type A: free inlet hemispherical sone levels.

# SOUND PERFORMANCE

## ESA | 300-9-100 1x1

CFM	SP	RPM	Sound Power Levels								"Lw <sub>i</sub> A (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
8000	1.000	754	74/80	84/87	74/75	67/72	65/69	66/74	67/75	62/62	75/80	63.1	14.0
	2.500	991	86/89	92/95	85/85	76/80	74/75	73/79	73/82	68/70	83/87	71.2	22.8
	3.000	1066	91/93	94/96	89/88	79/83	76/77	76/80	75/84	69/72	85/89	73.8	26.1
10000	1.000	865	76/82	90/92	78/79	71/76	69/71	69/76	71/80	67/65	79/84	67.9	18.9
	2.500	1064	82/86	94/97	86/88	77/82	73/76	74/80	75/84	70/72	84/89	72.3	24.0
	4.000	1250	91/94	94/97	96/98	83/86	79/82	79/82	78/86	75/82	90/94	78.6	33.6
12000	1.000	984	79/84	94/95	83/83	75/80	73/74	73/79	74/81	70/68	83/87	71.5	23.3
	2.000	1103	80/85	95/97	87/89	78/82	74/76	75/81	76/86	72/73	85/90	73.5	25.8
	3.000	1213	83/88	92/96	92/95	81/85	76/80	76/82	77/86	74/80	87/92	75.6	27.7
	5.000	1422	92/95	94/97	100/102	88/90	82/86	81/84	81/88	80/90	93/97	81.8	45.7
14000	7.000	1624	100/102	101/103	103/105	93/94	86/90	86/86	84/90	83/91	97/100	86.0	54.0
	1.500	1163	82/87	97/98	91/91	81/84	76/79	77/82	78/86	74/75	87/91	76.0	29.4
	2.500	1266	83/88	91/95	98/100	83/86	77/81	77/82	79/86	77/83	91/94	79.8	34.6
	4.000	1408	86/91	89/94	100/103	87/89	80/85	79/83	80/88	80/90	93/97	81.7	41.9
	6.000	1588	92/97	94/98	103/105	91/92	84/89	83/85	83/90	82/91	96/100	84.6	47.8
19000	9.000	1849	101/104	103/105	106/108	98/98	90/94	88/89	87/93	86/96	101/103	89.2	65.8
	2.000	1516	89/94	90/95	101/101	90/91	83/88	83/85	83/89	83/90	95/97	83.4	44.0
	3.000	1597	89/94	90/96	104/105	91/92	84/89	83/85	83/90	84/91	97/99	85.8	50.2
	4.000	1673	90/95	90/97	105/106	92/93	85/90	84/86	84/91	85/93	98/101	86.4	52.5
	7.000	1885	92/97	92/98	104/107	95/97	88/93	85/88	86/93	87/96	98/103	87.0	54.9
23000	3.000	1840	93/98	93/98	108/108	96/96	89/93	87/88	87/93	88/96	101/103	89.6	65.4
	4.000	1907	93/98	93/98	105/106	97/97	89/94	87/88	87/93	88/96	100/103	88.3	59.9
	6.000	2224	86/89	86/91	91/93	95/96	87/92	89/88	86/84	84/82	96/97	84.4	43.5

## ESA | 300-12-100 1x1

CFM	SP	RPM	Sound Power Levels								"Lw <sub>i</sub> A (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
8000	1.000	750	71/76	86/85	72/76	68/73	69/72	67/74	67/75	65/63	76/81	64.4	15.1
	2.000	908	76/79	84/86	88/86	73/79	73/76	72/79	70/79	69/70	82/85	70.7	20.4
	3.000	1071	80/83	84/87	92/90	77/83	76/80	76/82	74/83	72/76	86/89	74.1	24.6
10000	1.000	863	76/80	86/85	82/82	73/78	73/76	71/77	71/77	70/67	80/84	68.8	19.1
	2.500	1055	80/83	84/87	92/91	77/83	76/80	75/82	74/82	73/73	86/89	74.5	25.1
	3.500	1184	83/86	84/88	95/93	79/85	78/82	78/84	77/86	74/78	88/92	76.9	29.0
	5.000	1380	86/89	84/89	95/96	83/89	81/86	82/86	80/89	78/85	90/95	79.0	32.9
12000	1.000	983	80/84	85/86	93/90	78/82	77/79	75/80	75/81	74/70	86/88	75.0	26.0
	3.000	1203	83/87	84/88	96/95	80/86	79/83	79/84	77/87	76/77	89/92	77.7	30.5
	4.000	1308	85/88	84/89	97/96	82/88	80/85	81/85	79/88	77/82	91/94	79.3	33.5
	7.000	1634	90/93	88/92	101/100	90/94	84/90	86/89	84/92	82/91	95/99	84.0	45.0
14000	1.500	1161	84/88	85/88	97/94	81/86	80/83	79/84	78/85	78/75	90/92	78.8	32.7
	2.500	1260	85/89	85/88	97/96	82/87	80/85	80/85	79/87	78/78	91/93	79.5	33.9
	4.000	1396	87/90	85/89	96/97	85/89	82/87	82/86	81/88	80/85	91/95	79.7	42.5
	6.000	1577	89/93	87/91	101/100	89/93	84/90	85/88	83/91	82/90	95/98	83.5	43.8
	9.000	1857	92/96	91/95	99/101	103/101	88/94	88/91	87/94	86/95	101/103	89.8	60.1
17000	2.000	1392	88/93	87/91	98/96	87/90	84/88	84/87	81/88	82/85	93/95	81.4	38.8
	3.000	1476	89/93	87/91	101/100	88/91	84/89	84/87	82/89	83/89	95/97	83.6	44.2
	5.000	1629	90/94	88/92	102/101	92/94	85/91	86/89	84/91	84/91	96/99	84.9	47.8
	8.000	1851	92/96	91/95	99/101	104/102	89/94	88/91	87/94	86/95	102/103	90.5	62.3
21000	3.000	1715	93/98	91/96	101/100	98/97	89/93	89/91	86/92	87/92	99/100	87.2	53.7
	4.000	1785	93/98	92/96	100/100	105/102	89/94	89/91	87/93	87/93	103/103	91.7	67.0
	6.000	1914	94/98	93/97	99/100	106/104	91/96	90/92	88/95	88/96	104/104	92.1	69.4

The sound power level ratings shown are in decibels referred to 10<sup>-12</sup> watts calculated per AMCA International Standard 301. dBA levels are not licensed by AMCA International. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LW<sub>i</sub> and LW<sub>i</sub>A, and outlet LW<sub>o</sub> and LW<sub>o</sub>A sound power levels for installation Type A: Free inlet, Free outlet.

The sound ratings shown are loudness values in fan sones at 1.5m (5 ft) in a hemispherical free field calculated per AMCA International Standard 301. Values shown are for Installation Type A: free inlet hemispherical sone levels.

# SOUND PERFORMANCE

## ESA | 330-9-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
8000	1.000	622	79/73	84/73	69/69	65/70	64/75	64/75	62/71	58/67	73/80	61.2	12.8
	1.500	709	83/78	87/76	75/71	69/73	68/77	67/78	65/75	60/70	76/83	64.5	15.7
10000	2.000	796	89/83	89/80	81/74	73/76	73/79	70/81	67/78	63/73	80/86	68.1	19.3
	1.000	698	76/73	88/76	73/71	67/72	66/76	67/78	66/75	61/70	76/82	64.2	15.3
	2.000	838	84/80	90/81	81/74	73/76	72/79	71/82	70/80	65/75	80/87	68.6	19.8
	3.500	1046	96/90	97/90	91/79	81/81	79/84	77/87	74/86	70/80	88/92	76.0	30.2
14000	1.000	874	81/78	94/83	82/76	74/78	73/80	73/83	73/82	69/78	83/88	71.3	23.3
	2.500	1032	84/81	96/86	86/77	77/80	75/81	75/86	75/86	72/81	85/91	73.5	26.3
	4.000	1182	91/87	95/89	94/81	83/83	80/85	79/89	78/89	75/85	89/94	77.8	32.1
	6.000	1381	99/94	101/95	100/90	90/86	85/88	84/92	82/92	78/89	95/98	83.6	46.4
18000	1.500	1110	87/84	99/89	92/80	81/82	79/84	79/88	78/88	76/84	89/93	77.6	33.4
	2.500	1196	87/84	94/87	100/89	83/83	79/84	79/89	79/89	77/86	93/95	81.2	37.8
	3.500	1277	87/85	92/87	100/89	85/84	80/85	79/90	80/91	78/87	93/96	81.7	39.2
	5.000	1394	92/89	94/90	102/91	89/86	83/87	82/91	82/93	80/90	95/98	83.7	46.4
	7.000	1549	97/93	99/94	104/94	93/88	86/90	85/93	84/95	82/93	98/100	86.4	54.3
	9.000	1705	102/97	104/98	106/97	98/90	89/92	89/95	87/97	84/96	101/102	89.2	65.7
22000	2.000	1338	92/88	92/88	104/92	89/87	83/87	83/92	82/92	82/90	97/98	85.2	48.7
	3.500	1446	91/89	92/89	105/93	90/87	84/88	83/92	83/94	82/92	98/99	86.1	51.3
	5.000	1546	91/89	92/90	105/95	91/87	85/89	83/92	84/95	83/93	98/100	86.5	52.8
	8.000	1738	97/94	98/94	107/97	96/90	88/92	87/94	87/98	86/96	100/102	89.0	63.5
26000	3.000	1596	96/92	95/92	108/96	94/90	87/91	87/94	86/96	86/95	101/101	89.1	63.6
	5.000	1716	95/92	94/92	108/97	96/90	88/92	87/94	87/98	87/96	101/102	89.7	65.7
	6.000	2224	86/89	86/91	91/93	95/96	87/92	89/88	86/84	84/82	96/97	84.4	43.5

## ESA | 330-12-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
8000	1.000	624	72/72	84/71	72/71	67/73	67/77	66/76	62/72	57/67	74/81	62.4	13.2
	1.500	705	73/77	84/74	76/74	69/76	70/80	69/79	65/76	59/71	76/84	64.5	14.3
	2.000	790	75/83	87/78	79/76	71/78	72/83	71/82	68/79	62/74	79/87	67.2	16.9
10000	1.000	706	74/73	85/74	77/74	70/74	70/79	69/79	67/77	61/71	77/84	65.3	15.4
	2.000	837	76/80	89/78	82/77	73/78	73/83	73/83	71/81	65/76	81/88	69.2	19.3
	3.500	1039	81/88	88/87	92/81	78/82	78/88	78/89	75/86	70/81	87/94	75.3	26.2
14000	1.000	885	80/77	94/80	88/80	77/80	77/83	75/84	74/83	69/78	85/90	73.4	24.8
	2.500	1040	82/81	87/83	95/82	80/82	78/85	78/88	77/87	72/82	89/93	77.3	29.6
	4.000	1179	85/87	87/87	98/84	84/85	80/88	81/91	79/90	75/85	91/96	80.0	34.6
	6.000	1370	88/94	87/94	99/88	90/88	83/91	84/96	83/93	79/90	94/100	82.4	40.3
18000	1.500	1124	86/82	89/84	98/85	85/85	82/87	81/90	80/89	77/85	92/95	80.5	36.2
	2.500	1213	87/84	88/85	101/86	87/86	83/87	82/91	81/90	78/87	94/96	82.5	40.4
	3.500	1291	87/85	87/86	101/87	88/87	83/88	83/92	82/92	79/89	94/97	82.8	43.3
	6.000	1471	90/91	89/91	100/90	93/90	85/91	86/95	85/95	82/92	96/101	84.1	44.7
	8.000	1617	92/95	91/96	103/93	95/92	87/93	88/98	87/97	84/95	98/103	86.8	53.4
	9.000	1692	92/97	91/98	104/95	96/92	88/94	89/99	88/99	85/96	99/104	87.6	55.8
22000	2.000	1354	91/87	90/87	104/89	91/89	87/90	86/94	84/93	83/91	98/99	86.1	51.4
	4.000	1500	91/89	90/89	105/91	94/90	87/91	87/95	86/95	84/93	99/101	87.4	55.7
	8.000	1742	93/94	93/94	106/94	99/93	89/94	89/98	89/99	87/97	101/104	89.5	63.1
26000	3.000	1614	95/91	93/90	108/93	98/93	90/93	90/96	88/97	87/96	102/103	90.3	67.7
	3.500	1648	95/91	94/91	108/93	99/93	90/93	90/97	88/98	88/96	102/103	90.5	68.5
	5.000	1739	95/92	94/92	108/94	101/94	91/94	90/97	89/99	88/98	103/104	91.2	70.9

The sound power level ratings shown are in decibels referred to 10<sup>-12</sup> watts calculated per AMCA International Standard 301. dBA levels are not licensed by AMCA International. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWI and LWiA, and outlet LWo and LWoA sound power levels for installation Type A: Free inlet, Free outlet.

The sound ratings shown are loudness values in fan sones at 1.5m (5 ft) in a hemispherical free field calculated per AMCA International Standard 301. Values shown are for Installation Type A: free inlet hemispherical sone levels.

# SOUND PERFORMANCE

## ESA | 365-9-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
10000	1.000	568	85/76	80/67	69/70	66/71	65/76	65/76	62/71	58/67	72/81	60.8	11.9
	1.500	645	84/79	87/77	74/73	70/74	69/79	68/79	65/75	61/71	77/84	65.1	16.2
	2.000	722	90/83	90/79	79/75	73/77	73/81	71/81	68/79	64/74	80/86	68.3	19.7
14000	1.000	686	80/76	91/80	76/74	71/75	70/79	70/80	69/78	65/73	79/85	67.7	18.9
	2.500	854	87/83	94/84	84/78	76/80	75/82	74/86	73/84	69/79	84/90	72.1	24.4
	4.000	1020	97/91	99/91	92/81	83/83	81/86	80/90	77/88	72/83	89/94	77.9	34.0
18000	1.000	820	83/80	96/85	83/78	76/80	75/82	74/85	75/84	71/79	84/90	73.0	25.9
	2.000	914	83/81	97/86	85/78	77/80	75/82	76/87	76/86	72/81	85/92	73.9	27.3
	3.500	1044	89/86	98/90	90/81	81/83	79/85	79/90	78/89	75/84	89/95	77.0	32.4
22000	7.000	1344	103/97	104/98	103/92	92/89	87/91	87/95	84/95	80/92	98/100	86.1	55.7
	1.500	1033	87/84	100/90	90/82	81/83	80/85	79/89	79/88	76/84	89/94	77.8	34.7
	2.500	1081	87/85	101/90	92/82	82/84	80/85	80/90	80/90	77/86	90/95	78.6	35.9
	3.500	1154	88/86	101/91	95/83	84/85	81/86	80/91	81/92	78/87	91/97	80.0	38.1
	5.000	1260	92/89	97/91	102/92	88/87	84/88	83/93	83/93	80/90	96/99	84.1	47.6
26000	9.000	1541	103/98	105/99	107/97	97/91	90/93	89/97	87/98	85/96	101/103	89.7	69.0
	2.000	1178	91/88	104/93	99/86	87/87	83/88	83/92	81/89	94/98	82.9	45.7	
	3.500	1278	91/89	95/90	104/93	89/88	84/88	83/93	83/94	82/91	97/99	85.7	50.6
	6.000	1430	94/91	96/93	106/95	92/89	86/91	85/95	85/96	84/94	99/101	87.5	57.6
	8.000	1549	98/95	99/96	107/98	96/91	89/93	88/96	87/98	86/96	101/103	89.4	66.0
30000	2.500	1350	95/92	95/91	107/95	92/90	87/91	86/95	85/95	85/93	100/101	88.5	60.9
	4.000	1438	95/92	95/92	108/96	93/90	87/91	86/95	86/97	86/95	101/102	89.2	63.6
	6.000	1547	94/92	95/93	108/98	94/90	88/92	87/95	87/98	86/96	101/103	89.5	65.1
	6.000	2224	86/89	86/91	91/93	95/96	87/92	89/88	86/84	84/82	96/97	84.4	43.5

## ESA | 365-12-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
10000	1.000	570	75/73	83/72	71/72	68/75	68/78	67/77	63/72	57/68	74/82	62.7	13.1
	1.500	642	75/78	87/74	76/75	70/77	71/81	69/79	66/76	60/71	77/85	65.7	15.9
	2.000	716	76/83	86/78	79/77	72/80	73/84	72/82	68/79	62/75	79/88	67.7	17.1
14000	1.000	696	77/75	91/77	80/77	74/78	73/82	72/81	70/79	64/74	81/87	69.3	20.1
	2.000	803	79/80	93/80	84/79	75/80	76/84	75/85	73/83	67/77	83/90	71.6	22.6
	3.000	905	81/85	92/84	88/82	78/83	78/87	78/88	75/86	70/81	85/93	74.0	24.4
	4.000	1012	84/90	91/89	95/83	80/85	80/90	80/91	78/89	72/83	89/96	77.8	30.6
18000	1.000	830	82/79	96/81	87/81	79/82	79/85	77/86	76/85	71/79	86/91	74.7	27.4
	2.500	967	83/82	92/84	97/84	81/83	80/87	79/89	78/88	73/83	90/94	78.9	32.7
	3.500	1047	85/86	90/87	98/85	83/85	81/89	81/91	80/90	75/85	92/96	80.1	35.3
	5.000	1167	87/91	90/91	98/87	87/88	83/91	84/94	82/92	77/88	93/99	81.2	37.7
22000	8.000	1418	92/98	91/98	101/93	94/92	87/95	88/99	87/97	83/94	97/104	85.7	49.4
	2.000	1057	87/84	92/86	101/87	85/86	83/89	82/92	81/90	77/86	94/97	82.5	40.9
	3.000	1132	87/85	90/87	99/87	87/87	83/89	83/93	82/92	78/88	93/98	81.9	39.6
	5.000	1265	89/90	90/90	103/89	91/89	85/91	85/95	84/94	81/91	96/100	85.0	47.7
	7.000	1396	91/94	91/94	104/92	94/92	87/94	88/98	86/96	83/94	98/103	86.6	53.1
26000	9.000	1529	93/98	92/99	105/95	96/93	89/96	90/100	89/99	85/96	100/105	88.5	60.0
	2.000	1198	91/87	92/88	105/90	90/89	87/91	86/94	84/93	82/90	98/99	86.4	52.5
	3.500	1296	91/88	91/89	105/91	92/90	87/91	87/96	86/95	83/92	98/101	86.9	54.3
30000	6.000	1441	92/92	92/92	103/92	95/92	88/93	88/97	87/97	85/95	99/103	87.1	54.9
	2.500	1365	94/90	93/90	107/93	94/92	90/93	89/97	87/96	86/94	101/102	89.4	64.5
	6.000	1565	94/92	94/93	108/95	98/94	90/94	90/98	89/99	88/98	102/105	90.7	69.9

The sound power level ratings shown are in decibels referred to 10<sup>-12</sup> watts calculated per AMCA International Standard 301. dBA levels are not licensed by AMCA International. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWI and LWiA, and outlet LWO and LWOA sound power levels for installation Type A: Free inlet, Free outlet.

The sound ratings shown are loudness values in fan sones at 1.5m (5 ft) in a hemispherical free field calculated per AMCA International Standard 301. Values shown are for Installation Type A: free inlet hemispherical sone levels.

# SOUND PERFORMANCE

## ESA | 402-9-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
14000	1.000	696	77/75	91/77	80/77	74/78	73/82	72/81	70/79	64/74	81/87	69.3	20.1
	2.000	803	79/80	93/80	84/79	75/80	76/84	75/85	73/83	67/77	83/90	71.6	22.6
	3.000	905	81/85	92/84	88/82	78/83	78/87	78/88	75/86	70/81	85/93	74.0	24.4
18000	1.000	830	82/79	96/81	87/81	79/82	79/85	77/86	76/85	71/79	86/91	74.7	27.4
	2.500	967	83/82	92/84	97/84	81/83	80/87	79/89	78/88	73/83	90/94	78.9	32.7
	5.000	1167	87/91	90/91	98/87	87/88	83/91	84/94	82/92	77/88	93/99	81.2	37.7
22000	1.000	746	85/81	98/86	83/80	77/81	76/84	75/85	75/84	72/79	85/91	73.9	27.7
	2.500	1057	87/84	92/86	101/87	85/86	83/89	82/92	81/90	77/86	94/97	82.5	40.9
	4.000	1132	87/85	90/87	99/87	87/87	83/89	83/93	82/92	78/88	93/98	81.9	39.6
	7.000	1396	91/94	91/94	104/92	94/92	87/94	88/98	86/96	83/94	98/103	86.6	53.1
26000	1.500	890	87/85	101/89	89/82	81/84	80/86	79/90	79/89	76/84	89/95	77.9	35.1
	3.000	996	87/85	101/92	91/82	82/85	80/86	80/92	80/91	77/86	90/96	78.7	36.6
	5.000	1128	94/90	103/94	97/85	87/88	84/89	83/94	83/94	80/89	94/99	82.4	48.3
	8.000	1325	102/98	104/98	105/95	94/91	89/93	88/97	87/97	84/94	100/103	88.2	63.5
	9.000	1391	105/100	107/100	107/96	96/92	91/94	90/98	88/99	85/96	101/104	89.7	70.7
30000	2.000	1027	91/88	104/93	94/85	85/87	83/89	83/93	82/92	80/88	93/98	81.3	44.8
	3.500	1121	90/88	104/94	97/85	86/87	83/89	83/94	83/94	81/90	94/99	82.4	45.2
	6.000	1265	95/92	100/94	106/95	91/90	86/91	86/96	86/97	83/93	99/102	87.3	57.6
	9.000	1435	102/98	104/99	108/97	96/93	90/94	90/98	89/99	86/97	102/104	90.4	72.3
38000	2.500	1263	96/93	100/94	109/97	93/92	88/93	88/97	87/97	86/94	102/102	90.0	68.1
	3.500	1316	97/93	98/94	109/97	94/92	89/93	88/97	88/98	87/95	102/103	90.3	69.4
	5.000	1390	96/94	98/94	109/98	95/92	89/93	88/98	88/99	87/97	102/104	90.8	71.5
	6.000	1390	96/94	98/95	110/98	95/92	89/93	88/98	89/100	88/97	103/104	91.1	72.8

## ESA | 402-12-100 1x1

CFM	SP	RPM	Sound Power Levels								"LwIA (Inlet / Outlet)"	dBA.	Sones
			Octave Band Center Frequency (Hz) (Inlet / Outlet)										
			63	125	250	500	1000	2000	4000	8000			
14000	1.000	558	78/75	89/75	74/74	71/77	70/80	70/80	65/75	60/70	78/85	66.0	16.5
	2.000	672	78/82	91/79	81/79	74/81	75/85	73/83	70/81	64/76	81/89	69.8	20.1
	3.000	795	97/90	95/86	87/80	79/82	79/86	76/87	73/84	69/80	86/92	74.4	28.1
18000	1.000	646	83/79	93/82	77/76	72/77	72/82	72/82	71/80	67/75	81/87	69.5	21.2
	2.500	792	81/83	95/83	86/82	78/83	78/87	78/88	75/86	69/80	86/93	74.2	26.2
	5.000	1019	87/94	94/93	98/87	84/88	83/94	84/95	81/92	75/87	92/99	80.8	37.1
22000	1.000	746	85/81	98/86	83/80	77/81	76/84	75/85	75/84	72/79	85/91	73.9	27.7
	2.000	842	83/82	98/84	89/84	80/84	80/87	79/89	78/88	72/82	88/94	76.5	30.5
	3.500	952	86/87	95/87	99/86	83/86	82/90	82/92	80/91	75/85	92/97	81.0	37.4
	5.000	1060	88/91	93/92	100/88	86/88	84/93	84/95	83/93	77/88	94/100	82.6	41.4
26000	8.000	1287	92/99	92/99	104/92	94/93	88/97	89/100	87/97	83/94	98/105	86.9	54.3
	1.500	901	87/84	98/86	95/86	84/86	83/89	82/91	81/89	76/84	91/96	79.7	35.1
	3.000	1008	87/86	94/88	101/88	85/87	84/90	83/93	82/92	78/87	95/98	83.1	42.7
	4.000	1071	89/88	93/90	102/89	87/88	85/91	84/95	84/94	79/88	96/100	84.1	46.2
	7.000	1254	92/95	93/95	104/92	93/92	88/95	88/99	87/97	83/93	99/103	87.0	54.9
30000	9.000	1380	94/100	93/100	105/95	96/94	89/97	90/102	89/99	85/96	100/106	88.6	60.6
	2.000	1040	90/87	96/88	104/90	88/89	86/92	85/94	84/93	80/89	97/99	85.6	50.3
	3.500	1135	91/88	94/90	103/91	90/90	87/92	86/96	85/95	82/91	97/101	85.2	49.2
	6.000	1271	93/92	93/93	106/93	94/92	88/94	88/98	88/97	84/94	100/103	88.1	59.2
38000	9.000	1429	95/98	94/98	105/95	98/95	90/97	91/101	90/100	87/97	101/106	89.4	63.8
	3.000	1306	96/92	96/92	109/95	96/94	92/95	91/99	89/98	88/96	103/104	91.1	72.8
	5.000	1409	96/93	95/94	108/96	98/95	92/96	92/100	90/100	89/98	102/106	90.9	71.6

The sound power level ratings shown are in decibels referred to 10<sup>-12</sup> watts calculated per AMCA International Standard 301. dBA levels are not licensed by AMCA International. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for inlet LWI and LWiA, and outlet LWo and LWoA sound power levels for installation Type A: Free inlet, Free outlet.

The sound ratings shown are loudness values in fan sones at 1.5m (5 ft) in a hemispherical free field calculated per AMCA International Standard 301. Values shown are for Installation Type A: free inlet hemispherical sone levels.

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- Vane axial fans
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