Fiberglass Centrifugal Fans

Model BCSW-FRP

- Belt and Direct Drive
- Backward-Curved Wheels

GREENHECK®
Building Value in Air.

April
2019

Model BCSW-FRP

Greenheck's model BCSW-FRP backward-curved centrifugal fans are designed to provide reliable and efficient operation for corrosive applications. Our products are manufactured using hand lay-up and chop spray fiberglass construction techniques. Every fiberglass component complies with the ASTM C582 and ASTM D4167 specifications for fiberglass laminates and blowers.

- Fiberglass Reinforced Plastic (FRP) available in sizes 6-73
- Both belt and direct drive arrangements
- Backward-curved single-width wheel
- Concentric mount bearings with the industry's highest cataloged bearing life
- Each BCSW-FRP fan complies with ASTM D4167 and ASTM C582 through the use of a protective layer of "C" veil as standard.
- Coated steel drive frame
- AMCA Spark A Resistant
- AMCA Licensed Air Performance Certified Rating for sizes 15-73. Sizes 6, 8 and 10 are not AMCA Licensed.
- Capacities range from 300 to 150,000 cfm (510 to 255,000 m³/hr)

Greenheck Fan Corporation certifies that the model BSCW-FRP sizes 15-73 fans shown herein are licensed to bear the AMCA seal. Sizes 6, 8, and 10 are not certified. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and comply with the requirements of the AMCA Certified Ratings Program.

BCSW-FRP Model Number Code:

22 - BCSW - FRP - 4 - CCW - III - BH

- **22** — Fan Size: 6-73
- **BCSW - FRP** — Model: Backward-Curved Single Width Fiberglass Reinforced Plastic
- **4** — Arrangement: 4, 9, 9H, 10
- **CCW** — Rotation: CW, CCW
- **III** — Class: I, II, III, IV
- **BH** — Discharge Position

Leading Edge Support

All Greenheck products are supported by the industry's best product literature, electronic media, and Computer Aided Product Selection (CAPS) program. You'll also find extensive product and Installation, Operation and Maintenance Manuals (IOM) information on the internet.

And of course, you can always count on the personal service and expertise of our national and international representative organization. To locate your nearest Greenheck representative, call 715-359-6171 or visit our website at www.greenheck.com

Typical Applications

Greenheck BCSW-FRP centrifugal fans are the fan of choice for use in highly corrosive environments. A few of typical applications are detailed below.

Wastewater Treatment

Wastewater treatment plants produce some of the most corrosive gases that flow through any duct system including hydrogen sulfide, methane, ammonia, chlorine, and many others. In addition to the wastewater components, a number of corrosive chemicals are added to the wastewater at different stages of the process.

Wastewater treatment plant ventilation is split into two categories: general ventilation and odor control. Model BCSW-FRP fans are mainly used in the odor control portion of the ventilation system. Hydrogen sulfide is the most common gas produced by the wastewater. It is highly explosive, so an explosion proof motor should be used, and the fan should be statically grounded by carbon gelling the interior surface of the fan housing.

Semiconductor Manufacturing

There are many toxic and corrosive materials used in the semiconductor fabrication process. A variety of acids are utilized to clean the metals before the chips are assembled. Different acids and corrosive gases are also used in various other stages of the manufacturing process. The most common of these include hydrochloric acid (HCl), hydrofluoric acid (HF), phosphoric acid (H_3PO_4), and ammonia (NH_3).

It is important that all systems in a semiconductor manufacturing facility run continuously, without fail. The hazardous chemicals and acids used pose a health hazard for employees if not vented properly.

FRP fans can last decades without needing to be replaced, and with minimal maintenance requirements, limiting the duration of ventilation downtime.

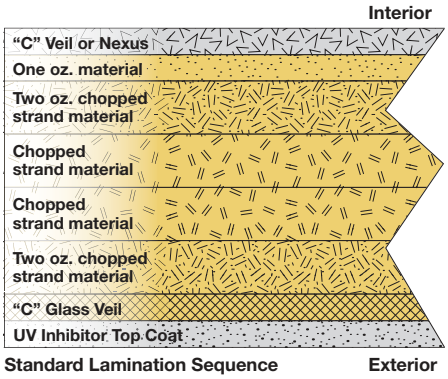
Other Industries:

- Chemical Process
- Pharmaceutical
- Fertilizer
- Pulp and Paper
- Metal and Metal Finishing
- Fiber Optics/Glass
- Food and Agricultural
- Mining/Minerals Processing

Other Applications:

- Roasters
- Precipitators
- Plant Ventilation
- Digesters
- Reagant Preparation
- Clean Rooms
- Scrubbers for Pollution Control
- Pickling and Galvanizing Lines

Corrosion Resistance



Corrosion Resistance

- No steel parts exposed to the airstream.
- Resin specially formulated for resistance to corrosive chemicals.
- Nexus Veil (a synthetic cloth) layering is optional for the most severe applications, such as hydrogen fluoride and strong oxidizers.
- Ultraviolet (UV) resistant top coat — all surfaces exposed to UV rays are stabilized against ultraviolet degradation, suitable for outdoor installation.

Corrosion Resistance and Temperature Rating

Chemical	Aluminum	Stainless 316	Carbon Steel	BCSW-FRP Temperature Resistance °F (°C)
Resistance: G = Good F = Fair NR = Not Recommended				
Acetic Acid (10%) - Fumes	G	G	F	210° *(99°)*
Ethyl Alcohol	G	G	G	150° *(66°)*
Aluminum Chloride	NR	G	NR	210° *(99°)*
Aluminum Fluoride	F	NR	G	90° *(32°)*
Ammonium Chloride	NR	F	NR	210° *(99°)*
Ammonium Sulphate	NR	G	F	210° *(99°)*
Barium Chloride	NR	G	F	210° *(99°)*
Barium Hydroxide	NR	G	F	150° *(66°)*
Bromine, Wet Gas	NR	NR	NR	90° *(32°)*
Calcium Oxide (Caustic Lime)	NR	F	-	170° *(77°)*
Carbon Dioxide (Dry)	F	G	NR	210° *(99°)*
Chlorine Gas (Dry)	F	F	NR	180° *(82°)*
Chlorine Gas (Moist)	NR	NR	NR	180° *(82°)*
Chlorine Water	NR	NR	NR	180° *(82°)*
Chromic Acid (5%)	F	G	NR	100° *(38°)*
Citric Acid	F	G	NR	210° *(99°)*
Copper Chloride	NR	NR	NR	210° *(99°)*
Copper Cyanide	NR	G	NR	210° *(99°)*
Copper Nitrate	NR	G	NR	210° *(99°)*
Copper Sulphate	NR	G	NR	210° *(99°)*
Ferric Chloride	NR	NR	NR	180° *(82°)*
Ferric Sulphate	NR	F	NR	210° *(99°)*
Ferrous Sulphate	G	G	NR	210° *(99°)*
Fluoboric Acid	NR	F	NR	180° *(82°)*
Formic Acid (10%)	F	G	NR	180° *(82°)*

Chemical	Aluminum	Stainless 316	Carbon Steel	BCSW-FRP Temperature Resistance °F (°C)
Resistance: G = Good F = Fair NR = Not Recommended				
Hydrobromic Acid (25%)	NR	NR	NR	200° *(93°)*
Hydrochloric Acid (15%)	NR	NR	NR	210° *(99°)*
Hypochlorous Acid	NR	NR	NR	90° *(32°)*
Hydrofluosilicic Acid (10%)	NR	NR	-	150° *(66°)*
Hydrofluoric Acid (10%)	NR	NR	NR	100° *(38°)*
Hydrogen Peroxide (30%)	G	G	NR	100° *(38°)*
Lactic Acid	F	G	NR	210° *(99°)*
Lithium Chloride	NR	NR	-	210° *(99°)*
Magnesium Chloride	NR	G	F	210° *(99°)*
Phosphoric Acid (10%)	NR	F	NR	210° *(99°)*
Picric Acid	NR	F	NR	100° *(38°)*
Potassium Carbonate (Potash)	NR	NR	-	180° *(82°)*
Potassium Chloride	NR	NR	F	210° *(99°)*
Potassium Hydroxide (Caustic Potash)	NR	NR	G	150° *(66°)*
Potassium Sulfate	NR	F	F	210° *(99°)*
Salt Spray	F	G	NR	210° *(99°)*
Sodium Carbonate	NR	NR	NR	180° *(82°)*
Sodium Chloride	NR	F	NR	210° *(99°)*
Sodium Hydroxide (Caustic Soda)	NR	NR	F	150° *(66°)*
Stearic	F	G	NR	210° *(99°)*
Sulfuric Acid (25%)	NR	NR	NR	200° *(93°)*
Sulfurous Acid (10%)	F	G	NR	100° *(38°)*
Tannic Acid	NR	F	NR	210° *(99°)*
Tartaric	F	G	NR	210° *(99°)*
Water, Fresh	F	G	NR	220° *(104°)*

BCSW-FRP fans are rated good for the maximum allowable temperature for each chemical. NOTE: Maximum allowable airstream temperature for BCSW-FRP fans currently offered is 180°F *(82°C)*.

Construction Features and Benefits

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Housings

BCSW-FRP housings are constructed from corrosion-resistant, fire retardant polyester resin systems. Each BCSW-FRP fan complies with ASTM D4167 and ASTM C582 through the use of a protective layer of "C" veil as standard. The standard housing lamination sequence is shown on page 4.

All hardware in contact with the airstream is made of stainless steel and will be encapsulated in fire retardant polyester to eliminate all sources of corrosion and ensure all components have the same extended service life as the fan itself.

Where shaft to wheel connection is made outside of the airstream, fan shafts are made of coated carbon steel. For shaft to wheel connections made in the airstream, 316 stainless steel is used.

The fan bases are constructed from heavy-gauge steel with a vinyl coating as standard. Epoxy coatings are also available for more severely corrosive environments. Arrangement 10 is standard for smaller fans up to size 25; Arrangement 9 is standard for sizes 30 thru 73.

Wheels

Greenheck BCSW-FRP centrifugal fans have non-overloading backward curved blades. Every wheel is laid up by hand. The blades are strapped to the backplate rather than just glued to ensure a stronger wheel. The backplate and hub are made of steel and encapsulated in FRP. The minimum peak static efficiency for every wheel is 65%. Every wheel is statically and dynamically balanced twice; the wheel is balanced by itself prior to assembly and then again in the housing. The balancing is conducted in accordance with AMCA 204-06 with a vibration limit of 0.05 in/sec velocity for direct drive and 0.078 in/sec velocity for belt drive.

Weatherhoods

BCSW-FRP weatherhoods protect the motor and drive components from rain, moisture, dust, dirt. They are standard on all arrangement 10 fans and optional on arrangement 4.

Belt Guards

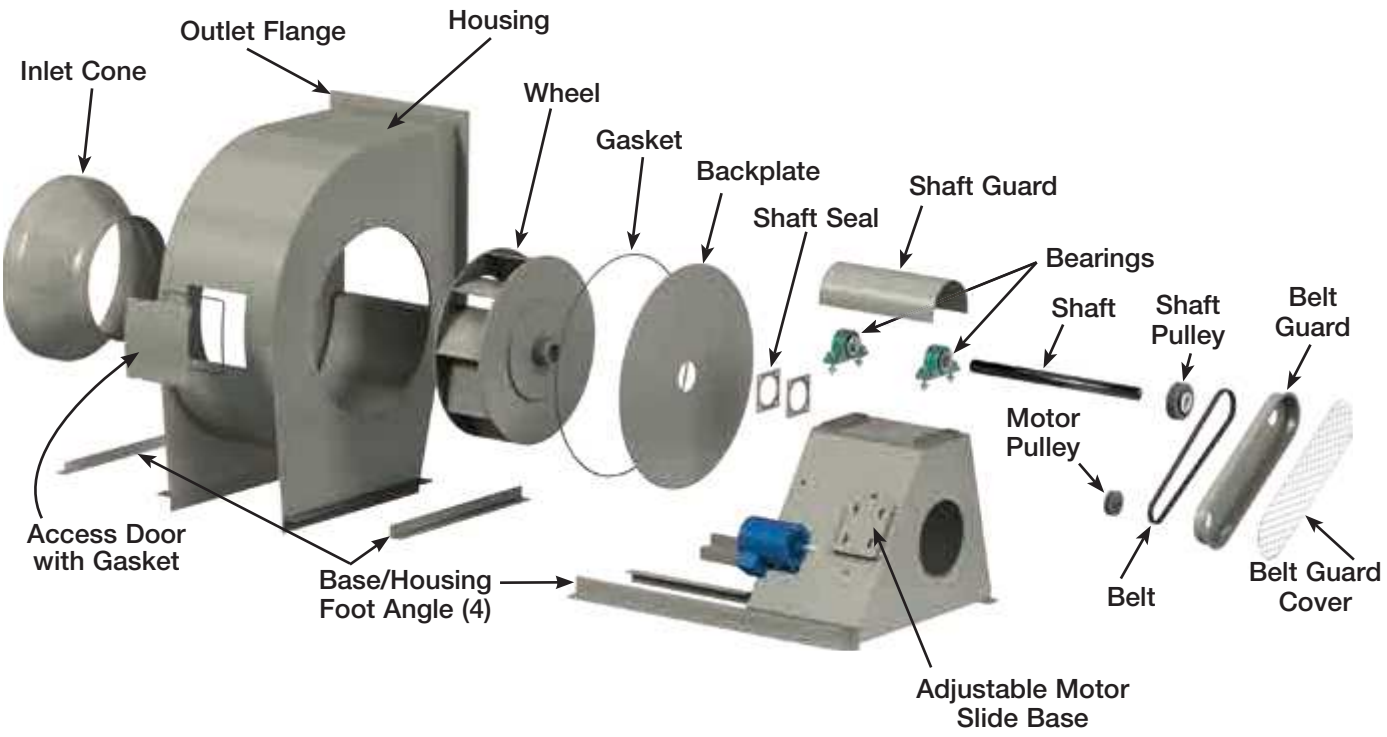
BCSW-FRP belt guards are required on all arrangement 9 and 9H fans and are designed for easy access to the belts and pulleys. BCSW-FRP shaft guards are required on all arrangement 9, and 9H fans and are designed to cover the shaft and bearings. All guards can be made to meet OSHA guidelines.

Premium Bearings

The FRP products are manufactured with "Air Handling Quality" self-aligning ball and roller bearings. Our standard bearings use concentric lock collars (no set screws) which ensure smooth operation and provide superior grip force between the bearing collar and fan shaft. All bearings are selected for a basic rating fatigue life of L_{10} in excess of 80,000 hours. For more critical applications, Greenheck offers bearings with a minimum L_{10} life in excess of 200,000 hours. Our bearings include zerk fittings for relubrication.

	L_{10} Life	Equal to L_{50} or Average Life
Industry Standard	40,000 hrs.	200,000 hrs.
Greenheck Standard	***80,000 hrs.***	***400,000 hrs.***
Greenheck Upgrade	200,000 hrs.	1,000,000 hrs.

L_{10} life implies 90% reliability or 10% failure rate after the stated hours.
L_{50} life implies 50% reliability or 50% failure rate after the stated hours.



Vibration Isolators

Greenheck offers a complete package of vibration isolators to reduce transmitted vibrations.

Vibration isolator options include neoprene, housed spring and restrained spring isolators. Housed and restrained springs are only available on sizes 30-73.

Isolator Type		Application
Housed Spring		Permits radial and axial vibration dampening where less motion can be tolerated.
Restrained Spring		Used where large weight changes or high wind loads occur. Upward vertical movement is prevented by mechanical restraints.
Rubber-in-Shear		Neoprene isolators highly effective for relatively small fans with RPMs of 1800 and over.

Inlet and Outlet Flanges
A slip fit connection on the inlet and an unpunched flange on the outlet are standard on all BCSW-FRP sizes and arrangements. An unpunched flange is also an option for the inlet.

Companion Flanges
Punched companion flanges are available for both the inlet and outlet for all sizes.

Discharge Transitions
Integral discharge transitions are available when a transition from rectangular discharge to round duct is needed. Integral transitions are available up to size 44. For sizes 48 to 73, a separate bolt-on transition is available.

Access Doors
Bolted or hinged (quick opening) access doors are available to provide access for inspection and cleaning. Raised access doors are also available for use with the integral acoustical insulation.

Drain Connection
A fiberglass reinforced plastic (FRP) coupling drain connection is located at the bottom of the fan housing to drain any water or other liquids that may accumulate within the fan.

Drive Frame Coatings
There are three types of coatings available for the fan drive frame: Types A, B, and C. Type A is a hand brushed enamel finish for the least corrosive applications. Type B is a sandblasted and epoxy coating for slightly more corrosive applications. Type C is a sandblasted and double epoxy coating for the most severely corrosive applications.

Stainless Steel Shafts
Stainless steel shafts are available for highly corrosive applications.

Shaft Seals
The standard seal is a Teflon® plate. Stuffing box type seals or mechanical seals are available for more severe requirements.

Extended Life Bearing
Extended life bearings are selected for a basic fatigue life L_{10} rating per ABMA Standards in excess of 200,000 hours at the maximum RPM for each pressure class. L_{10} is the life associated with 90% statistical reliability of a bearing.

Extended Lubrication Lines
Flexible rubber tubing extending from the bearings to grease fittings at a convenient location on the drive frame are available for all FRP fans. Stainless steel extended lubrication lines are also available for highly corrosive applications.

Disconnect Switches
Greenheck offers a wide variety of NEMA rated disconnect switches. Switches are shipped loose for field installation.

Integral Acoustical Insulation
Integral acoustical insulation is built into the fan by encasing 2 inches of insulation in fiberglass. This integral insulation allows for normal access to fan components while lowering the sound levels.

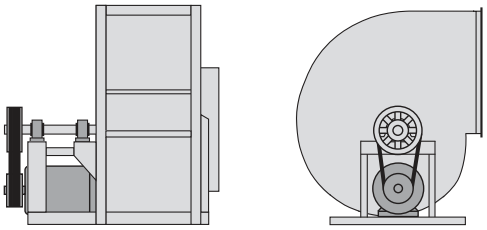
Carbon Gel
Every FRP surface in contact with airstream is graphite-impregnated to eliminate static buildup within the fan. A grounding lug is located externally. Used when explosive gases are in the airstream.

Nexus Veil
Nexus Veil is a type of synthetic cloth used to obtain a longer service life in aggressive environments. Necessary for hydrogen fluoride service and in environments containing strong oxidizers.

Arrangement 10 — Belt Drive

Sizes 6-25

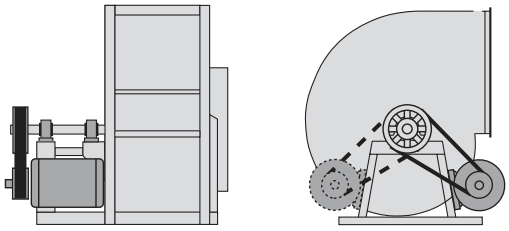
- Compact design providing space savings.
- Bearings are located out of the airstream.
- Motor is mounted beneath the drive frame.
- Includes easy-to-remove weatherhood.



Arrangement 9 — Belt Drive

Sizes 30-73

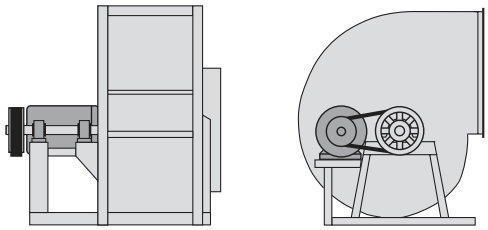
- Easy access to motors mounted on drive frame.
- Bearings are located out of the airstream.
- Standard motor position is on the left side of the drive frame for CW rotation and on the right side for CCW rotation.
- Belt guard and shaft guard is included.



Arrangement 9H — Belt Drive

Sizes 44-73

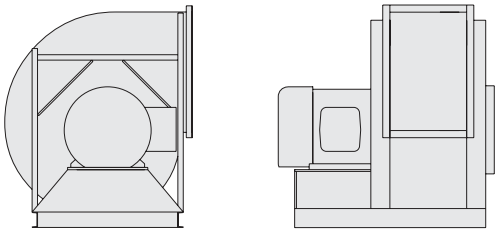
- Bearings are located out of the airstream.
- Motor is mounted horizontally on the drive frame for easy accessibility.
- Belt guard and shaft guard included.



Arrangement 4 — Direct Drive

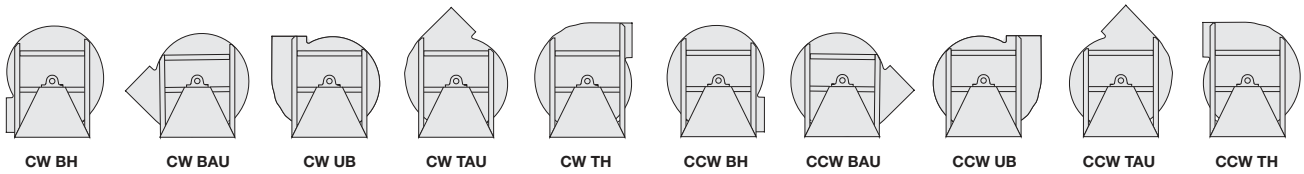
Sizes 6-25

- Available with wheel and housing modifications for specific performance.
- Provides compact design with low maintenance.



Discharge Positions and Rotatable Housings

All BCSW-FRP centrifugal fans are available with clockwise (CW) or counterclockwise (CCW) rotation in five standard discharge positions. Rotatable housings are standard on fan sizes 25 and less; arrangements 10 and 4.

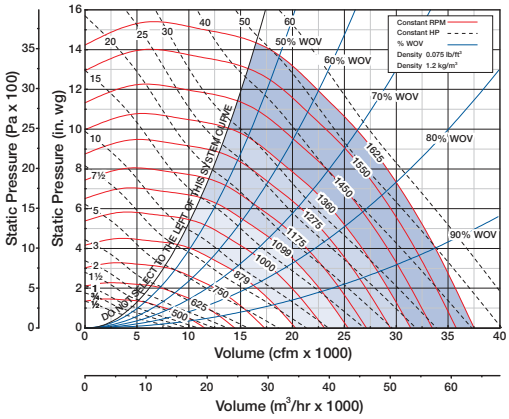


Class of Construction

Fan Class refers to a construction level designed to handle a given fan outlet velocity and pressure. As the fan performance requirements increase, the fan construction (material gauge, shaft diameter, motor size) must also increase to physically handle the new work load.

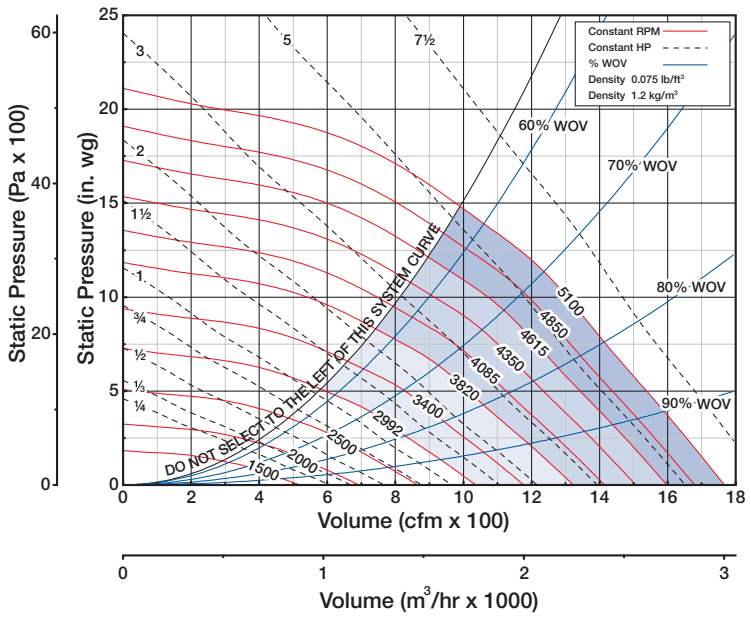
Centrifugal products are available in Class I, II, III, or IV, with Class I being the lightest construction and Class IV having the heaviest construction and performance capacity.

A typical fan curve is shown with shaded class limits.



Class I	Maximum rpm 2992
Class II	Maximum rpm 3820
Class III	Maximum rpm 4615
Class IV	Maximum rpm 5100

Wheel Diameter	12 inches
Minimum Starting HP	1/4 hp
Outlet Area	0.186 ft^2
Tip Speed	rpm x 1.57
Maximum BHP	$(rpm / 2807)^3$
Approximate Weight (LMD)	125 lbs.



CFM	OV	STATIC PRESSURE (inches wg)																	
		1		2		3		4		5		6		8		10		12	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
300	1612	1395	0.11																
400	2150	1587	0.18	1930	0.30														
500	2688	1819	0.28	2106	0.41	2381	0.56												
600	3225	2062	0.40	2323	0.56	2557	0.73	2789	0.91	3001	1.10								
700	3763	2312	0.57	2556	0.76	2765	0.95	2966	1.14	3169	1.35	3355	1.57						
800	4301	2568	0.78	2797	1.00	2996	1.22	3174	1.43	3347	1.65	3530	1.89	3860	2.38				
900	4838	2833	1.05	3043	1.29	3233	1.55	3404	1.78	3562	2.02	3709	2.26	4034	2.80	4313	3.34	4588	3.91
1000	5376	3101	1.37	3295	1.64	3474	1.92	3639	2.20	3791	2.46	3933	2.73	4212	3.28	4486	3.86	4745	4.47
1100	5913	3373	1.77	3551	2.06	3721	2.37	3879	2.68	4026	2.98	4163	3.27	4418	3.85	4662	4.45	4918	5.10
1200	6451	3647	2.23	3813	2.55	3972	2.88	4123	3.22	4265	3.56	4398	3.88	4645	4.51	4856	5.11		
1300	6989	3923	2.78	4079	3.12	4228	3.48	4371	3.84	4507	4.20	4637	4.57	4877	5.26	5079	5.90		
1400	7526	4200	3.41	4347	3.78	4486	4.15	4623	4.54	4754	4.93	4879	5.33						
1500	8064	4479	4.14	4618	4.54	4750	4.93	4879	5.34	5004	5.76								
1600	8602	4759	4.97	4891	5.39	5017	5.81												

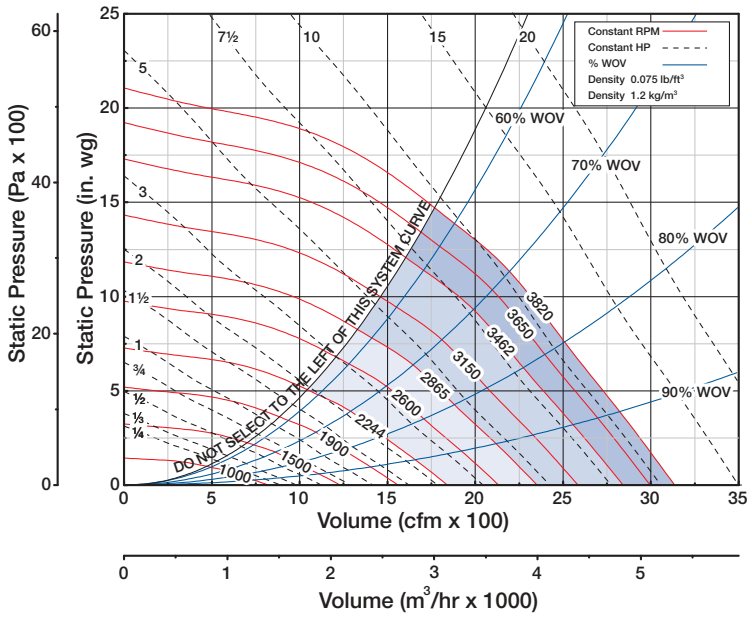
RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	$L_{WI}A$
1683	100	73	80	80	77	76	71	64	55	80
	85	73	80	81	73	72	69	63	54	78
	70	75	80	78	69	70	69	63	54	78
	50	75	79	78	67	68	69	63	54	75
2448	100	79	85	88	88	85	82	76	68	90
	85	78	85	89	89	81	79	75	67	89
	70	81	86	87	86	77	78	75	67	87
	50	81	86	87	86	75	78	75	67	87

RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	$L_{WI}A$
3468	100	87	89	95	96	93	92	87	80	99
	85	86	88	95	97	89	88	85	79	97
	70	89	90	96	94	85	85	85	79	95
	50	89	90	95	94	83	84	85	79	94
5100	100	95	95	100	104	104	101	98	92	108
	85	94	94	100	105	105	97	95	91	108
	70	97	97	102	103	102	93	94	91	106
	50	97	97	101	103	102	91	93	91	105

The AMCA Certified Ratings Seal does not apply to model BCSW-FRP size 6.

Class I	Maximum rpm 2244
Class II	Maximum rpm 2865
Class III	Maximum rpm 3462
Class IV	Maximum rpm 3820

Wheel Diameter	16 inches
Minimum Starting HP	1/4 hp
Outlet Area	0.333 ft^2
Tip Speed	rpm x 2.09
Maximum BHP	$(rpm / 1750)^3$
Approximate Weight (LMD)	155 lbs.



CFM	OV	STATIC PRESSURE (inches wg)																	
		1		2		3		4		5		6		8		10		12	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
500	1501	1021	0.19																
700	2102	1180	0.31	1440	0.52														
900	2702	1376	0.50	1588	0.74	1795	1.02												
1100	3303	1581	0.76	1774	1.06	1943	1.36	2117	1.69	2273	2.04								
1300	3903	1794	1.12	1973	1.48	2127	1.82	2267	2.17	2418	2.56	2558	2.96	2815	3.79				
1500	4504	2013	1.58	2178	2.00	2324	2.41	2455	2.81	2576	3.20	2706	3.64	2952	4.55	3172	5.48		
1700	5105	2238	2.17	2388	2.64	2526	3.12	2652	3.58	2767	4.02	2876	4.47	3100	5.45	3310	6.46	3509	7.51
1900	5705	2466	2.91	2603	3.42	2733	3.95	2853	4.49	2964	4.99	3068	5.49	3261	6.50	3457	7.58	3651	8.72
2100	6306	2697	3.81	2823	4.36	2944	4.94	3058	5.53	3165	6.12	3266	6.68	3452	7.79	3613	8.86	3798	10.08
2300	6906	2929	4.88	3047	5.49	3159	6.11	3267	6.75	3370	7.40	3467	8.05	3647	9.26	3802	10.42		
2500	7507	3163	6.15	3274	6.81	3377	7.47	3480	8.16	3578	8.86	3671	9.56						
2700	8108	3399	7.62	3502	8.34	3600	9.05	3695	9.78	3789	10.53								
2900	8708	3635	9.33	3733	10.10														

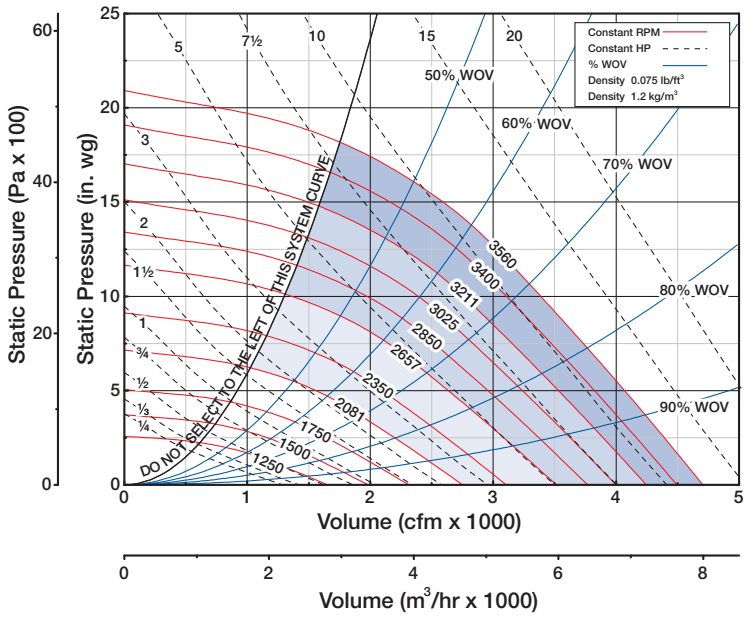
RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	L_{WiA}
1261	100	78	82	83	76	71	64	57	51	79
	85	76	79	79	69	63	57	53	49	74
	70	77	79	79	69	62	56	51	46	73
	50	76	75	74	67	61	55	50	45	70
1834	100	83	88	91	87	82	76	69	63	88
	85	81	87	87	81	75	69	63	59	83
	70	83	87	87	79	75	67	62	57	83
	50	83	85	82	77	73	67	61	56	80

RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	L_{WiA}
2598	100	90	93	97	99	92	87	80	73	99
	85	88	92	95	95	85	79	73	68	94
	70	90	92	95	95	85	78	72	67	94
	50	90	92	91	90	82	77	71	66	90
3820	100	98	99	104	107	103	98	93	85	108
	85	96	97	102	103	97	91	85	79	108
	70	98	99	102	103	95	92	83	78	103
	50	98	98	101	98	93	89	83	77	99

The AMCA Certified Ratings Seal does not apply to model BCSW-FRP size 8.

Class I	Maximum rpm 2081
Class II	Maximum rpm 2657
Class III	Maximum rpm 3211
Class IV	Maximum rpm 3560

Wheel Diameter	17.25 inches
Minimum Starting HP	1/4 hp
Outlet Area	0.515 ft^2
Tip Speed	rpm x 2.62
Maximum BHP	$(rpm / 1569)^3$
Approximate Weight (LMD)	185 lbs.



CFM	OV	STATIC PRESSURE (inches wg)																	
		1		2		3		4		5		6		8		10		12	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1200	2330	1201	0.45	1420	0.70	1612	0.97	1785	1.25	1948	1.54	2098	1.85	2378	2.48				
1450	2815	1354	0.65	1555	0.95	1729	1.26	1889	1.59	2040	1.92	2179	2.26	2443	2.98	2676	3.71	2901	4.48
1700	3300	1514	0.92	1701	1.27	1862	1.62	2010	1.99	2145	2.37	2282	2.75	2526	3.55	2751	4.36	2960	5.20
1950	3786	1680	1.26	1852	1.65	2005	2.06	2144	2.47	2273	2.89	2393	3.32	2628	4.20	2837	5.09	3039	6.02
2200	4271	1849	1.70	2010	2.13	2154	2.58	2285	3.04	2407	3.51	2524	3.98	2736	4.94	2939	5.92	3131	6.92
2450	4757	2022	2.22	2172	2.71	2306	3.20	2433	3.71	2549	4.22	2659	4.74	2866	5.79	3045	6.83	3234	7.93
2700	5242	2198	2.85	2337	3.40	2465	3.94	2584	4.48	2696	5.04	2802	5.61	3000	6.76	3173	7.87	3340	9.04
2950	5728	2375	3.60	2505	4.21	2627	4.79	2739	5.38	2847	5.98	2949	6.60	3138	7.84	3305	9.04	3468	10.29
3200	6213	2554	4.48	2676	5.14	2791	5.78	2899	6.42	3001	7.06	3099	7.71	3283	9.05	3439	10.33		
3450	6699	2735	5.50	2849	6.21	2958	6.91	3062	7.60	3159	8.28	3253	8.97	3431	10.40				
3700	7184	2916	6.67	3025	7.43	3127	8.20	3226	8.93	3320	9.66	3410	10.40						
3950	7669	3098	8.00	3201	8.82	3298	9.64	3393	10.43	3484	11.21								
4200	8155	3281	9.50	3379	10.37	3472	11.24												
4450	8640	3465	11.20	3558	12.10														

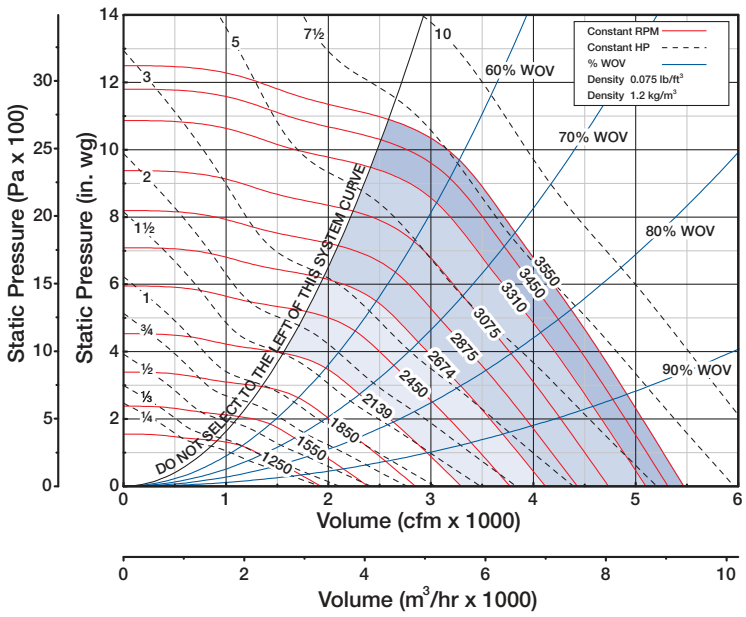
RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	L_{WiA}
1175	100	79	84	81	77	72	64	58	52	79
	85	78	80	76	70	64	58	53	49	73
	70	79	80	74	70	63	57	52	47	72
	50	78	75	72	67	62	56	51	46	69
1709	100	85	89	93	87	82	77	69	63	89
	85	83	88	89	81	75	69	64	60	84
	70	85	88	89	80	76	67	62	57	84
	50	84	86	84	78	73	67	61	56	81

RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	L_{WiA}
2421	100	91	95	99	100	93	88	80	74	100
	85	89	93	96	96	86	80	74	69	95
	70	91	94	96	96	86	79	73	68	95
	50	91	93	92	91	83	78	72	67	91
3560	100	100	100	105	109	104	99	93	86	109
	85	98	98	104	105	98	92	86	80	105
	70	100	100	104	105	96	92	84	79	104
	50	100	100	102	100	94	90	84	78	101

The AMCA Certified Ratings Seal does not apply to model BCSW-FRP size 10.

Class I	Maximum rpm 2139
Class II	Maximum rpm 2674
Class III	Maximum rpm 3310
Class IV	Maximum rpm 3550

Wheel Diameter	15 inches
Minimum Starting HP	1/4 hp
Outlet Area	1.29 ft^2
Tip Speed	rpm x 3.93
Maximum BHP	$(rpm / 1789)^3$
Approximate Weight (LMD)	195 lbs.



CFM	OV	STATIC PRESSURE (inches wg)																	
		1		2		3		4		5		6		8		10		12	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
900	697	1098	0.21																
1200	930	1203	0.30	1536	0.57														
1500	1162	1345	0.41	1619	0.72	1887	1.07												
1800	1395	1495	0.55	1750	0.92	1972	1.30	2198	1.71	2415	2.20								
2100	1627	1653	0.72	1892	1.15	2095	1.58	2284	2.02	2482	2.50	2664	3.00						
2400	1860	1820	0.93	2040	1.41	2234	1.92	2407	2.40	2568	2.90	2747	3.44	3072	4.59				
2700	2093	1991	1.19	2194	1.71	2380	2.27	2546	2.85	2699	3.38	2841	3.93	3152	5.15	3427	6.41		
3000	2325	2164	1.51	2355	2.07	2529	2.67	2690	3.30	2837	3.94	2977	4.54	3239	5.78	3507	7.11		
3300	2558	2342	1.88	2521	2.49	2683	3.14	2838	3.81	2981	4.51	3114	5.21	3362	6.53				
3600	2790	2522	2.31	2690	2.98	2843	3.67	2990	4.38	3129	5.12	3258	5.89	3499	7.38				
3900	3023	2704	2.81	2862	3.54	3009	4.27	3144	5.03	3279	5.82	3406	6.62						
4200	3255	2888	3.39	3036	4.17	3176	4.95	3307	5.76	3433	6.58								
4500	3488	3073	4.04	3212	4.89	3347	5.72	3472	6.57										
4800	3720	3259	4.79	3391	5.68	3519	6.57												

RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	L_{WiA}
1172	100	72	74	76	78	70	62	58	53	77
	85	70	73	74	75	68	61	57	53	75
	70	70	73	73	69	65	62	59	56	72
	50	74	73	73	67	63	62	61	61	71
1704	100	80	80	82	85	86	72	68	64	88
	85	79	78	82	83	82	71	68	64	85
	70	79	78	81	80	75	71	68	65	81
	50	82	82	81	80	72	71	70	69	81

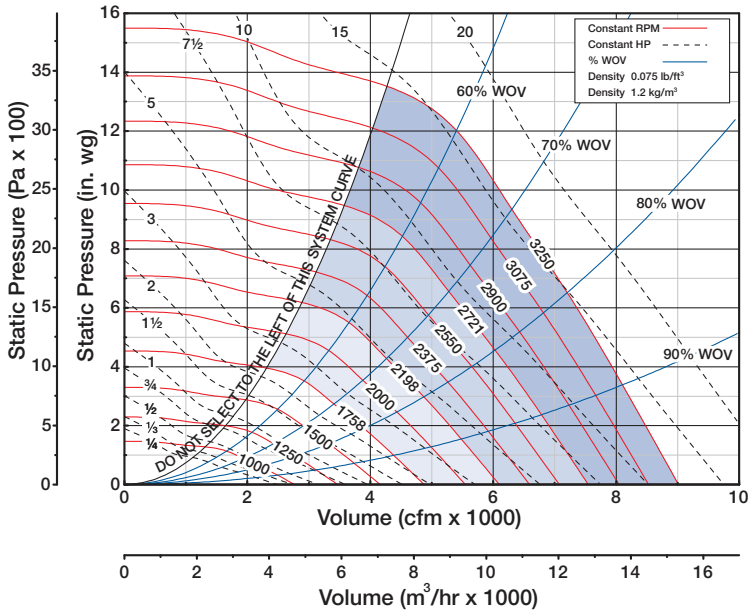
RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	L_{WiA}
2414	100	88	88	89	90	93	86	78	73	95
	85	86	86	88	89	90	84	77	73	93
	70	86	86	87	88	85	81	77	74	90
	50	89	89	89	89	83	79	78	77	90
3550	100	96	96	96	98	100	102	88	84	105
	85	95	95	94	97	99	99	87	84	103
	70	95	95	94	97	97	91	87	85	99
	50	97	97	98	97	96	88	87	86	100

Performance certified is for installation type B: Free inlet, Ducted outlet. Power ratings (Bhp) do not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories).

The AMCA Certified Ratings Seal applies to air performance ratings only.

Class I	Maximum rpm 1758
Class II	Maximum rpm 2198
Class III	Maximum rpm 2721
Class IV	Maximum rpm 3250

Wheel Diameter	18.25 inches
Minimum Starting HP	1/4 hp
Outlet Area	1.92 ft^2
Tip Speed	rpm x 4.78
Maximum BHP	$(rpm / 1291)^3$
Approximate Weight (LMD)	225 lbs.



CFM	OV	STATIC PRESSURE (inches wg)																	
		1		2		3		4		5		6		8		10		12	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
1650	859	957	0.40	1253	0.81														
2200	1145	1100	0.60	1327	1.06	1548	1.57												
2750	1432	1253	0.86	1460	1.43	1635	1.99	1820	2.62	1992	3.31								
3300	1718	1418	1.19	1607	1.86	1771	2.55	1916	3.22	2070	3.95	2218	4.72	2505	6.49				
3850	2005	1589	1.63	1761	2.38	1916	3.18	2055	3.98	2182	4.76	2306	5.57	2568	7.34	2807	9.28		
4400	2291	1766	2.19	1923	3.02	2068	3.90	2200	4.82	2322	5.75	2437	6.63	2655	8.47	2878	10.44	3087	12.52
4950	2578	1946	2.87	2092	3.79	2224	4.75	2351	5.76	2468	6.80	2577	7.87	2780	9.84	2965	11.86	3170	14.09
5500	2864	2131	3.70	2265	4.72	2389	5.76	2506	6.85	2619	7.97	2724	9.12	2920	11.44	3089	13.56		
6050	3151	2317	4.68	2442	5.81	2559	6.94	2667	8.10	2774	9.31	2876	10.54	3065	13.10	3227	15.51		
6600	3437	2505	5.85	2620	7.08	2731	8.30	2835	9.55	2933	10.83	3031	12.15	3214	14.87				
7150	3723	2694	7.20	2803	8.54	2907	9.86	3006	11.20	3099	12.56	3189	13.95						
7700	4010	2885	8.77	2987	10.20	3084	11.64	3179	13.06										
8250	4296	3076	10.60	3173	12.10														

RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	$L_{Wi}A$
1073	100	76	78	80	82	72	65	61	56	81
	85	74	77	78	79	71	65	61	57	79
	70	74	77	77	72	68	65	62	59	75
	50	78	77	76	70	67	66	65	65	75
1560	100	84	84	86	89	88	76	72	67	91
	85	83	83	86	87	85	75	71	67	88
	70	83	82	85	84	78	75	72	69	85
	50	86	86	85	83	76	75	74	73	85

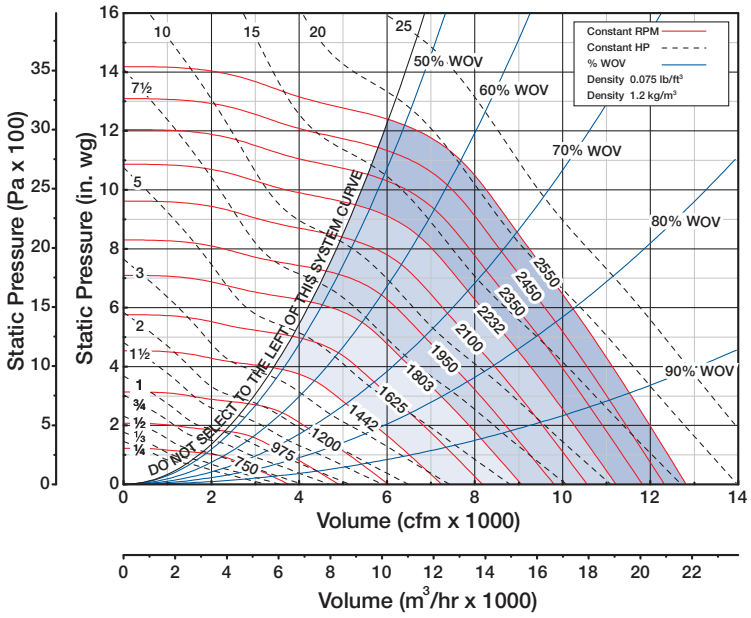
RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	$L_{Wi}A$
2210	100	92	91	94	96	98	88	81	77	100
	85	90	90	93	94	94	87	81	77	97
	70	90	90	92	92	88	84	81	78	94
	50	93	93	93	92	86	83	82	81	93
3250	100	101	100	100	102	105	105	92	88	109
	85	99	99	98	102	103	101	91	88	107
	70	99	99	98	101	100	94	91	88	104
	50	102	102	102	101	99	92	91	90	103

Performance certified is for installation type B: Free inlet, Ducted outlet. Power ratings (Bhp) do not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories).

The AMCA Certified Ratings Seal applies to air performance ratings only.

Class I	Maximum rpm 1442
Class II	Maximum rpm 1803
Class III	Maximum rpm 2232
Class IV	Maximum rpm 2550

Wheel Diameter	22.25 inches
Minimum Starting HP	1/2 hp
Outlet Area	2.84 ft^2
Tip Speed	rpm x 5.83
Maximum BHP	$(rpm / 929)^3$
Approximate Weight (LMD)	300 lbs.



CFM	OV	STATIC PRESSURE (inches wg)																	
		1		2		3		4		5		6		8		10		12	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2450	862	785	0.60	1027	1.21														
3200	1126	892	0.87	1082	1.54	1267	2.30												
3950	1390	1006	1.20	1178	2.02	1328	2.85	1480	3.76	1628	4.82								
4700	1654	1128	1.63	1287	2.59	1424	3.56	1546	4.53	1680	5.61	1801	6.71						
5450	1919	1256	2.19	1402	3.26	1531	4.41	1647	5.52	1752	6.63	1867	7.84	2082	10.38				
6200	2183	1388	2.89	1520	4.07	1644	5.33	1754	6.65	1856	7.91	1951	9.16	2148	11.87	2333	14.72	2519	18.01
6950	2447	1522	3.74	1646	5.04	1760	6.40	1866	7.84	1964	9.32	2056	10.75	2224	13.56	2398	16.58		
7700	2711	1659	4.75	1775	6.18	1880	7.66	1981	9.20	2076	10.80	2164	12.45	2328	15.59	2471	18.65		
8450	2975	1799	5.96	1906	7.53	2006	9.12	2099	10.77	2190	12.48	2276	14.24	2434	17.87				
9200	3239	1939	7.37	2039	9.09	2134	10.80	2222	12.56	2307	14.37	2391	16.25	2544	20.11				
9950	3503	2081	9.01	2174	10.88	2265	12.71	2349	14.59	2428	16.51	2508	18.49						
10700	3767	2224	10.90	2312	12.90	2397	14.90	2478	16.90										
11450	4031	2367	13.10	2451	15.20	2530	17.30												
12200	4295	2511	15.50																

RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	$L_{Wi}A$
842	100	76	79	81	82	69	65	60	56	81
	85	75	78	79	79	68	64	60	56	78
	70	75	77	77	71	68	65	62	59	75
	50	79	78	76	69	68	66	66	65	75
1224	100	85	86	87	90	84	75	71	66	90
	85	83	85	86	88	82	75	71	66	88
	70	83	84	85	82	78	75	72	69	84
	50	87	86	86	81	76	75	74	74	84

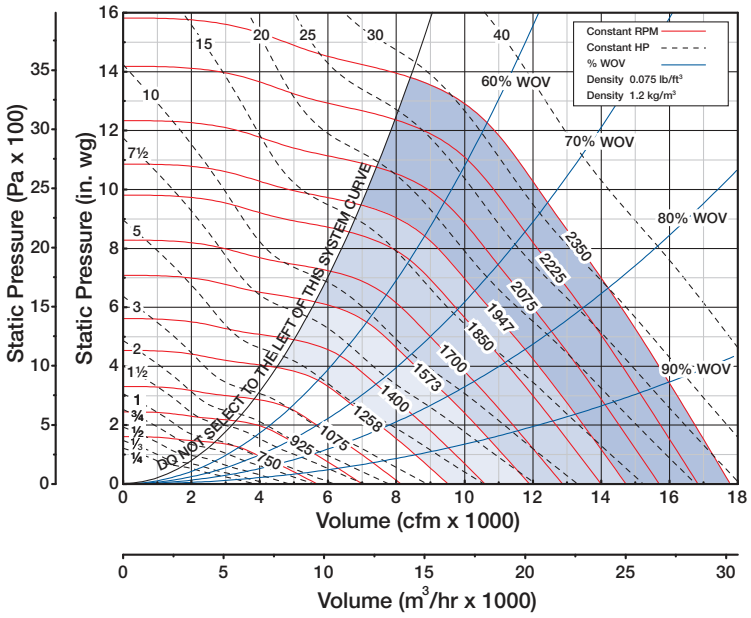
RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	$L_{Wi}A$
1734	100	93	92	95	97	98	85	81	76	100
	85	91	91	94	95	95	84	80	76	98
	70	91	90	93	93	87	84	81	78	94
	50	94	94	94	92	84	84	82	81	93
2550	100	101	101	102	103	106	100	91	87	108
	85	99	99	100	102	104	98	91	87	107
	70	99	99	100	101	99	94	91	88	103
	50	102	102	102	102	97	92	91	90	103

Performance certified is for installation type B: Free inlet, Ducted outlet. Power ratings (Bhp) do not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories).

The AMCA Certified Ratings Seal applies to air performance ratings only.

Class I	Maximum rpm 1258
Class II	Maximum rpm 1573
Class III	Maximum rpm 1947
Class IV	Maximum rpm 2350

Wheel Diameter	25.5 inches
Minimum Starting HP	1 hp
Outlet Area	3.72 ft^2
Tip Speed	rpm x 6.68
Maximum BHP	$(rpm / 740)^3$
Approximate Weight (LMD)	410 lbs.



CFM	OV	STATIC PRESSURE (inches wg)																	
		1		2		3		4		5		6		8		10		12	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3650	981	725	0.93	912	1.74														
4750	1276	833	1.37	987	2.35	1133	3.40	1273	4.60										
5850	1572	948	1.94	1091	3.16	1211	4.34	1330	5.61	1447	6.96	1561	8.48						
6950	1868	1072	2.71	1202	4.08	1315	5.56	1417	6.95	1511	8.39	1617	9.97	1808	13.29				
8050	2163	1200	3.70	1316	5.23	1425	6.87	1521	8.60	1611	10.21	1693	11.84	1868	15.39	2032	19.13	2197	23.51
9150	2459	1331	4.94	1439	6.64	1538	8.44	1630	10.33	1715	12.29	1796	14.16	1942	17.86	2095	21.86	2243	26.06
10250	2755	1465	6.45	1565	8.35	1655	10.31	1743	12.36	1825	14.48	1901	16.66	2044	20.87	2170	24.96	2306	29.40
11350	3051	1601	8.27	1693	10.38	1779	12.51	1858	14.72	1937	17.00	2011	19.35	2148	24.21	2271	28.67		
12450	3346	1738	10.40	1823	12.80	1904	15.10	1980	17.40	2052	19.90	2124	22.40	2257	27.60				
13550	3642	1877	13.00	1956	15.50	2032	18.00	2104	20.60	2172	23.20	2239	25.80						
14650	3938	2016	16.00	2090	18.70	2162	21.40	2231	24.10	2296	26.90								
15750	4233	2156	19.40	2226	22.30	2293	25.30												
16850	4529	2297	23.30																

RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	$L_{Wi}A$
776	100	79	81	84	83	71	66	62	57	82
	85	78	81	82	80	70	66	62	58	80
	70	77	80	79	73	70	67	64	61	77
	50	81	80	78	71	70	69	68	67	77
1128	100	87	90	91	93	84	77	73	68	92
	85	85	89	90	90	83	76	73	68	90
	70	85	88	88	84	80	77	74	71	87
	50	89	89	88	82	79	77	77	76	87

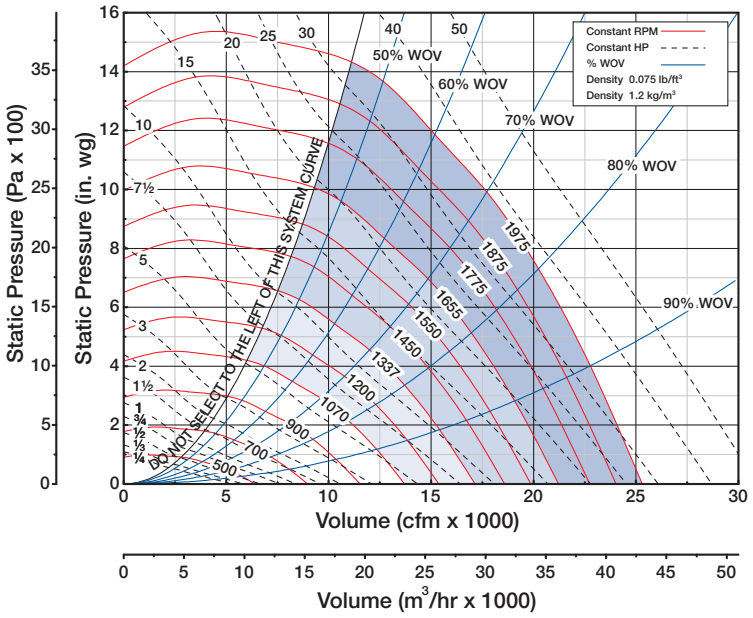
RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	$L_{Wi}A$
1598	100	95	95	97	100	99	86	82	78	102
	85	93	93	96	98	96	86	82	78	99
	70	93	93	95	95	89	86	83	80	96
	50	96	97	96	94	87	86	84	84	96
2350	100	104	103	106	107	109	101	93	89	111
	85	102	101	105	105	106	99	93	89	108
	70	102	101	104	104	100	96	93	90	106
	50	105	105	104	104	98	95	94	93	105

Performance certified is for installation type B: Free inlet, Ducted outlet. Power ratings (Bhp) do not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories).

The AMCA Certified Ratings Seal applies to air performance ratings only.

Class I	Maximum rpm 1070
Class II	Maximum rpm 1337
Class III	Maximum rpm 1655
Class IV	Maximum rpm 1975

Wheel Diameter	30 inches
Minimum Starting HP	1 hp
Outlet Area	4.85 ft^2
Tip Speed	rpm x 7.85
Maximum BHP	$(rpm / 588)^3$
Approximate Weight (LMD)	600 lbs.



CFM	OV	STATIC PRESSURE (inches wg)																	
		1		2		3		4		5		6		8		10		12	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
3000	618	525	0.61																
4550	938	578	0.91	749	1.82														
6100	1257	652	1.36	805	2.43	931	3.60	1052	4.94										
7650	1577	741	1.94	874	3.25	993	4.59	1099	6.02	1195	7.53	1293	9.23						
9200	1896	840	2.70	954	4.23	1062	5.82	1162	7.42	1255	9.11	1339	10.86	1501	14.66				
10750	2216	944	3.69	1043	5.43	1140	7.25	1232	9.10	1320	10.96	1402	12.88	1552	16.92	1683	21.10	1820	25.84
12300	2536	1052	4.94	1142	6.88	1227	8.92	1310	11.02	1391	13.14	1469	15.25	1614	19.62	1740	24.09	1858	28.80
13850	2855	1164	6.50	1244	8.64	1321	10.88	1397	13.19	1470	15.56	1541	17.97	1681	22.71	1802	27.47	1919	32.56
15400	3175	1278	8.39	1348	10.73	1421	13.17	1487	15.70	1557	18.28	1623	20.91	1752	26.22	1868	31.30		
16950	3494	1392	10.70	1456	13.20	1523	15.80	1586	18.60	1646	21.40	1710	24.20	1828	30.00	1938	35.60		
18500	3814	1508	13.30	1568	16.10	1626	18.90	1687	21.90	1745	24.90	1799	27.90	1914	34.10				
20050	4134	1624	16.50	1680	19.40	1733	22.50	1790	25.60	1845	28.80	1897	32.10						
21600	4453	1741	20.10	1794	23.30	1844	26.50	1894	29.80	1947	33.20								
23150	4773	1859	24.30	1908	27.60	1956	31.10												

RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	L_{WiA}
652	100	83	91	80	79	72	63	58	53	81
	85	80	89	77	75	67	60	56	52	78
	70	78	87	74	71	63	57	55	53	75
	50	75	83	71	68	64	57	56	55	72
948	100	94	99	94	87	84	76	68	64	91
	85	92	97	92	84	80	72	66	62	88
	70	91	95	89	80	76	69	64	62	85
	50	85	91	86	77	75	69	64	64	83

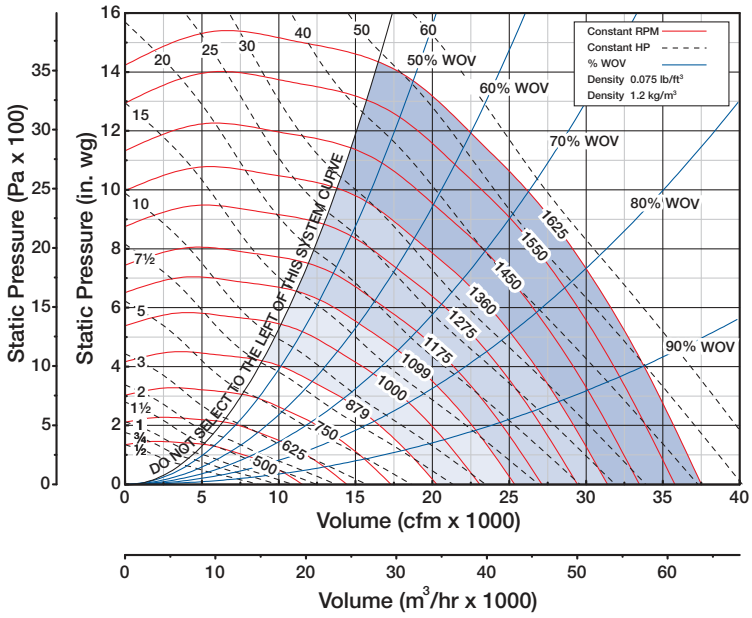
RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	L_{WiA}
1343	100	104	99	106	96	95	88	79	74	101
	85	102	96	105	93	91	83	76	72	99
	70	101	94	103	90	86	80	73	71	96
	50	94	91	98	87	84	80	73	72	92
1975	100	112	110	115	111	103	101	93	85	112
	85	111	108	113	108	100	96	88	82	109
	70	110	107	111	106	96	92	85	80	107
	50	103	101	107	102	93	91	85	80	103

Performance certified is for installation type B: Free inlet, Ducted outlet. Power ratings (Bhp) do not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories).

The AMCA Certified Ratings Seal applies to air performance ratings only.

Class I	Maximum rpm 879
Class II	Maximum rpm 1099
Class III	Maximum rpm 1360
Class IV	Maximum rpm 1625

Wheel Diameter	36.5 inches
Minimum Starting HP	1 hp
Outlet Area	7.12 ft^2
Tip Speed	rpm x 9.42
Maximum BHP	$(rpm / 425)^3$
Approximate Weight (LMD)	950 lbs.



CFM	OV	STATIC PRESSURE (inches wg)																	
		1		2		3		4		5		6		8		10		12	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
6950	976	480	1.40	618	2.75														
9250	1299	543	2.09	666	3.69	769	5.45	868	7.44										
11550	1622	617	2.97	724	4.94	820	6.92	907	9.09	985	11.35	1065	13.87						
13850	1945	699	4.13	791	6.43	879	8.80	960	11.17	1035	13.70	1105	16.33	1236	21.98	1360	28.2		
16150	2268	785	5.64	866	8.24	944	10.97	1019	13.74	1090	16.49	1156	19.33	1280	25.40	1386	31.63	1500	38.71
18450	2591	875	7.54	947	10.44	1016	13.49	1084	16.63	1149	19.81	1214	22.92	1331	29.39	1436	36.15	1533	43.23
20750	2914	967	9.90	1032	13.09	1094	16.45	1156	19.90	1216	23.44	1272	27.06	1387	34.07	1486	41.15	1583	48.79
23050	3237	1061	12.80	1117	16.30	1177	19.90	1231	23.70	1288	27.50	1342	31.50	1446	39.40	1541	46.90		
25350	3560	1155	16.20	1207	20.00	1261	23.90	1313	28.00	1362	32.20	1414	36.40	1510	45.10	1600	53.40		
27650	3883	1251	20.30	1299	24.40	1347	28.60	1397	33.00	1443	37.40	1488	42.00	1581	51.30				
29950	4206	1346	25.00	1392	29.40	1435	33.90	1481	38.60	1526	43.40	1569	48.20						
32250	4529	1443	30.50	1486	35.20	1527	40.00	1567	45.00	1610	50.00								
34550	4852	1540	36.70	1580	41.80	1619	46.90												
36500	5126	1623	43.3																

RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	$L_{Wi}A$
536	100	92	90	81	79	71	63	58	54	81
	85	91	88	78	75	66	60	56	53	78
	70	89	85	74	70	63	58	56	54	74
	50	84	81	71	69	64	58	57	56	72
780	100	94	100	92	89	84	75	69	64	91
	85	92	99	90	85	79	71	67	63	88
	70	90	97	87	81	75	69	65	63	86
	50	86	92	84	79	75	69	66	65	83

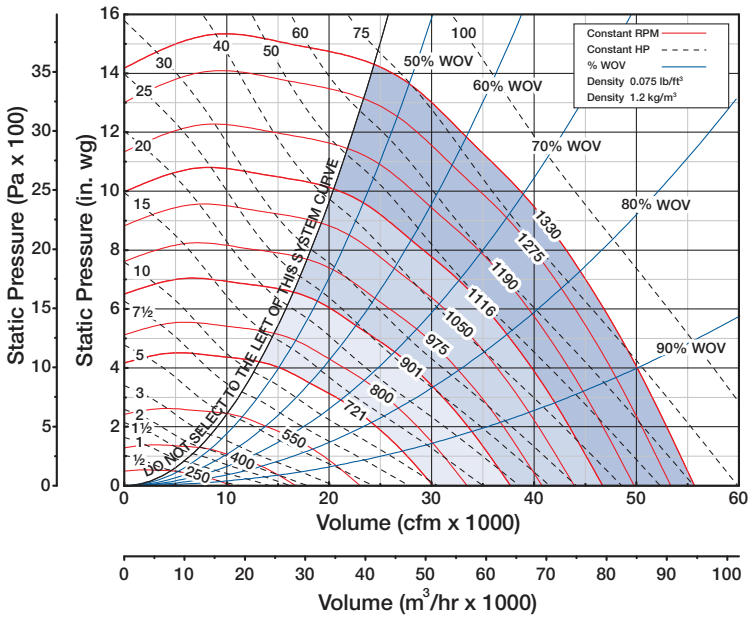
RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	$L_{Wi}A$
1105	100	105	108	106	96	95	88	79	74	102
	85	103	106	104	93	91	82	76	72	99
	70	102	104	102	90	86	79	74	72	96
	50	95	100	98	87	85	80	74	73	93
1625	100	114	110	116	109	105	100	92	85	112
	85	112	108	115	107	101	96	88	83	110
	70	111	106	113	104	97	92	85	81	107
	50	104	102	108	100	95	91	85	82	103

Performance certified is for installation type B: Free inlet, Ducted outlet. Power ratings (Bhp) do not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories).

The AMCA Certified Ratings Seal applies to air performance ratings only.

Class I	Maximum rpm 721
Class II	Maximum rpm 901
Class III	Maximum rpm 1116
Class IV	Maximum rpm 1330

Wheel Diameter	44.5 inches
Minimum Starting HP	1-1/2 hp
Outlet Area	10.61 ft^2
Tip Speed	rpm x 11.0
Maximum BHP	$(rpm / 306)^3$
Approximate Weight (LMD)	1250 lbs.



CFM	OV	STATIC PRESSURE (inches wg)																			
		1		2		3		4		5		6		8		10		12		14	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
9500	895	383	1.89	502	3.84																
13000	1225	433	2.86	537	5.16	624	7.69	707	10.62												
16500	1555	493	4.13	584	6.95	665	9.86	736	12.98	803	16.32	869	20.01								
20000	1885	562	5.81	639	9.15	713	12.59	780	16.08	842	19.77	900	23.59	1010	31.95						
23500	2214	633	8.01	700	11.83	766	15.81	829	19.85	887	23.91	943	28.13	1044	36.98	1136	46.33	1228	56.75		
27000	2544	708	10.80	769	15.10	826	19.60	882	24.20	937	28.80	989	33.40	1087	43.10	1174	53.10	1254	63.40		
30500	2874	786	14.30	839	19.00	891	24.00	942	29.10	991	34.30	1039	39.60	1133	50.00	1217	60.70	1296	71.90		
34000	3204	864	18.60	911	23.80	960	29.20	1005	34.80	1052	40.40	1096	46.20	1183	58.00	1263	69.40				
37500	3534	943	23.80	986	29.40	1031	35.20	1074	41.30	1114	47.50	1156	53.70	1236	66.60	1312	79.10				
41000	3864	1023	29.90	1063	36.00	1103	42.30	1143	48.80	1182	55.40	1218	62.20	1295	76.00						
44500	4194	1104	37.10	1141	43.70	1177	50.40	1215	57.30	1252	64.40	1287	71.60								
48000	4524	1185	45.40	1220	52.50	1254	59.60	1287	67.00	1322	74.50										
51500	4853	1266	55.00	1299	62.50																

RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	L_{WiA}
439	100	94	88	82	79	70	63	59	54	80
	85	92	86	79	74	66	61	57	53	77
	70	90	83	75	70	63	59	57	55	74
	50	86	79	73	69	64	60	59	58	72
638	100	94	102	91	91	84	74	69	65	92
	85	91	100	88	87	78	71	67	63	89
	70	89	99	85	82	75	69	66	64	86
	50	86	94	82	80	75	68	67	67	83

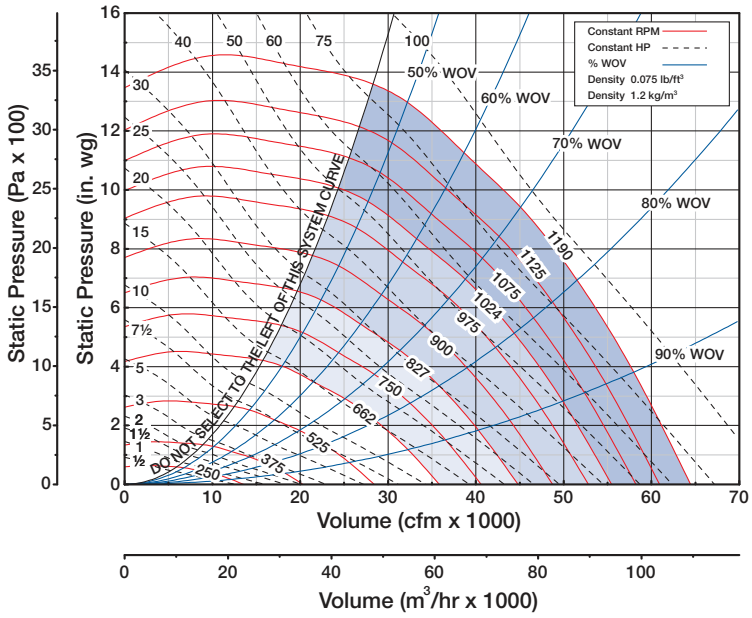
RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	L_{WiA}
904	100	105	110	104	98	95	86	79	75	102
	85	102	108	102	95	90	82	77	73	99
	70	101	106	99	91	86	79	75	73	96
	50	96	102	96	88	85	80	75	75	93
1330	100	116	110	118	107	107	100	90	85	113
	85	114	108	116	105	103	95	87	83	110
	70	113	106	115	101	98	91	85	82	108
	50	106	103	110	98	96	92	85	83	104

Performance certified is for installation type B: Free inlet, Ducted outlet. Power ratings (Bhp) do not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories).

The AMCA Certified Ratings Seal applies to air performance ratings only.

Class I	Maximum rpm 662
Class II	Maximum rpm 827
Class III	Maximum rpm 1024
Class IV	Maximum rpm 1190

Wheel Diameter	48.5 inches
Minimum Starting HP	1-1/2 hp
Outlet Area	12.6 ft^2
Tip Speed	rpm x 12.57
Maximum BHP	(rpm / 264)^3
Approximate Weight (LMD)	1700 lbs.



CFM	OV	STATIC PRESSURE (inches wg)																	
		1		2		3		4		5		6		8		10		12	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
11000	873	349	2.18	459	4.48														
15000	1190	391	3.27	488	5.93	570	8.92	646	12.35										
19000	1507	444	4.66	530	7.92	604	11.31	670	14.93	734	18.92	794	23.24						
23000	1825	504	6.50	576	10.37	646	14.32	708	18.38	766	22.67	818	27.12	923	37.04				
27000	2142	566	8.89	630	13.29	691	17.93	751	22.55	805	27.24	856	32.16	949	42.45	1038	53.68	1123	65.86
31000	2460	632	11.90	689	16.80	744	22.00	795	27.40	848	32.70	896	38.00	987	49.20	1068	60.90	1144	73.10
35000	2777	700	15.70	751	21.10	799	26.80	848	32.70	894	38.80	940	44.80	1027	56.90	1106	69.40	1179	82.50
39000	3095	769	20.30	814	26.30	860	32.50	902	38.90	946	45.50	988	52.30	1070	65.70	1145	79.00		
43000	3412	838	25.90	879	32.30	921	39.10	962	46.00	1000	53.20	1040	60.40	1114	75.40				
47000	3730	909	32.40	947	39.40	985	46.70	1023	54.10	1059	61.80	1094	69.60	1166	85.60				
51000	4047	980	40.10	1015	47.60	1049	55.40	1085	63.40	1120	71.50	1152	79.90						
55000	4365	1051	49.00	1084	57.10	1116	65.30	1148	73.80	1182	82.50								
59000	4682	1123	59.20	1154	67.80	1184	76.60												

RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	$L_{WI}A$
393	100	94	86	83	78	69	63	58	54	80
	85	93	84	79	73	65	60	57	53	76
	70	91	81	75	69	63	59	57	55	73
	50	86	78	72	69	63	60	59	58	72
571	100	102	101	91	90	82	73	69	64	91
	85	101	99	88	86	77	70	67	63	88
	70	99	97	84	81	74	68	66	64	85
	50	94	93	82	79	75	68	67	67	83

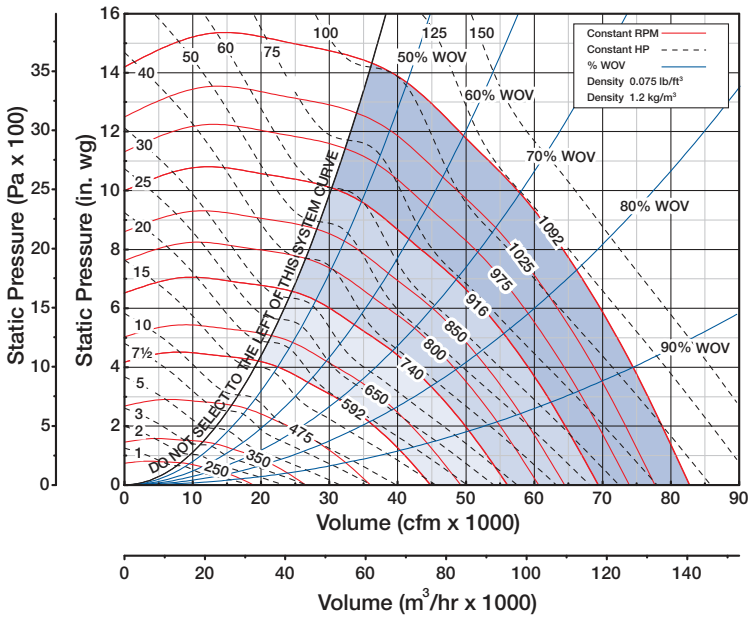
RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	$L_{WI}A$
809	100	104	110	102	98	94	85	79	74	101
	85	101	108	100	95	89	81	76	73	98
	70	100	106	97	91	85	78	75	73	95
	50	95	102	94	88	85	79	75	75	92
1190	100	116	118	117	107	106	99	89	85	113
	85	114	117	116	104	102	93	87	83	111
	70	113	115	114	100	97	90	84	82	108
	50	106	110	109	98	96	91	84	83	104

Performance certified is for installation type B: Free inlet, Ducted outlet. Power ratings (Bhp) do not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories).

The AMCA Certified Ratings Seal applies to air performance ratings only.

Class I	Maximum rpm 592
Class II	Maximum rpm 740
Class III	Maximum rpm 916
Class IV	Maximum rpm 1092

Wheel Diameter	54.25 inches
Minimum Starting HP	2 hp
Outlet Area	15.77 ft^2
Tip Speed	rpm x 14.2
Maximum BHP	$(rpm / 220)^3$
Approximate Weight (LMD)	2600 lbs.



CFM	OV	STATIC PRESSURE (inches wg)																	
		1		2		3		4		5		6		8		10		12	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
14000	887	314	2.73	411	5.41														
19000	1204	352	4.16	439	7.28	510	10.35												
24000	1521	399	5.92	475	10.03	543	13.99	600	17.54	657	22.06	711	27.98						
29000	1838	453	8.25	517	13.11	579	18.09	635	23.04	687	27.34	733	31.64	826	43.84				
34000	2155	509	11.30	565	16.80	620	22.60	673	28.40	722	34.40	768	39.70	850	49.70	929	62.40	1006	79.20
39000	2473	567	15.10	618	21.30	667	27.80	713	34.50	760	41.20	804	47.90	885	60.50	957	72.00	1024	83.70
44000	2790	628	19.90	673	26.70	716	33.90	760	41.20	801	48.80	842	56.40	920	71.60	992	85.60	1056	98.60
49000	3107	690	25.70	730	33.10	771	40.90	808	49.00	848	57.30	885	65.70	958	82.50	1027	99.50		
54000	3424	752	32.70	788	40.80	826	49.20	862	57.90	896	66.90	932	76.00	998	94.70	1065	112.90		
59000	3741	815	40.90	849	49.70	882	58.80	917	68.10	949	77.80	980	87.60	1044	107.50				
64000	4058	878	50.60	910	60.00	940	69.70	972	79.70	1003	90.00	1032	100.50	1092	121.80				
69000	4375	942	61.80	972	71.90	1000	82.20	1029	92.90	1058	103.80	1087	114.90						
74000	4692	1006	74.60	1034	85.40	1061	96.40	1086	107.70										

RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	L_{WiA}
360	100	96	86	84	78	69	64	59	55	80
	85	94	84	81	73	66	61	58	54	77
	70	92	81	76	70	63	60	58	56	74
	50	88	78	74	70	63	61	60	59	73
524	100	104	101	92	90	83	74	70	65	92
	85	102	99	89	86	78	72	68	64	89
	70	100	97	85	82	75	70	67	65	86
	50	96	93	83	80	75	70	69	68	83

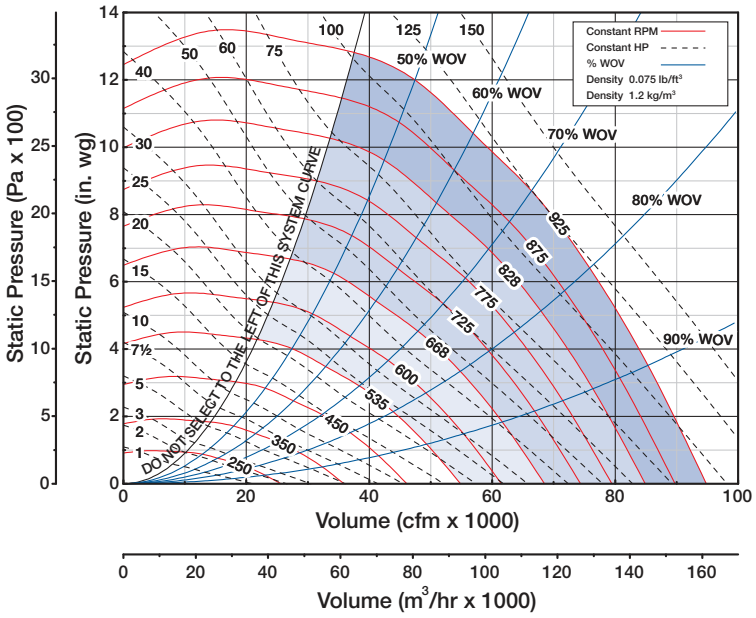
RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	L_{WiA}
743	100	105	111	103	100	94	85	80	75	102
	85	102	110	100	96	89	82	77	74	99
	70	100	108	97	92	86	79	76	74	96
	50	97	103	94	90	86	79	77	76	93
1092	100	116	120	117	108	107	99	90	86	113
	85	114	118	116	105	103	94	88	84	111
	70	113	116	113	102	98	91	86	83	108
	50	107	112	109	99	97	92	86	85	105

Performance certified is for installation type B: Free inlet, Ducted outlet. Power ratings (Bhp) do not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories).

The AMCA Certified Ratings Seal applies to air performance ratings only.

Class I	Maximum rpm	535
Class II	Maximum rpm	668
Class III	Maximum rpm	828
Class IV	Maximum rpm	925

Wheel Diameter	60 inches
Minimum Starting HP	2 hp
Outlet Area	19.22 ft^2
Tip Speed	rpm x 15.71
Maximum BHP	$(rpm / 186)^3$
Approximate Weight (LMD)	3000 lbs.



CFM	OV	STATIC PRESSURE (inches wg)																	
		1		2		3		4		5		6		8		10		12	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
17000	884	283	3.38	371	6.91														
23000	1196	317	5.01	395	9.09	461	13.68												
29000	1508	358	7.10	428	12.07	488	17.25	541	22.80	593	28.90	642	35.50						
35000	1821	406	9.84	465	15.72	521	21.74	571	27.94	618	34.49	660	41.27	745	56.45				
41000	2133	455	13.40	507	20.10	556	27.10	605	34.10	648	41.30	690	48.80	765	64.50	839	81.70	908	100.40
47000	2445	507	17.90	553	25.30	598	33.20	640	41.30	683	49.30	722	57.50	795	74.50	862	92.40	924	111.30
53000	2757	560	23.40	602	31.70	641	40.40	681	49.20	719	58.40	757	67.50	827	85.80	892	105.10		
59000	3069	615	30.20	652	39.20	689	48.70	724	58.40	760	68.40	794	78.60	861	98.80	923	119.30		
65000	3381	670	38.40	703	48.10	738	58.30	771	68.90	803	79.70	835	90.70	895	113.20				
71000	3694	726	48.00	757	58.60	788	69.50	819	80.80	848	92.50	878	104.30						
77000	4006	782	59.20	811	70.60	839	82.30	868	94.40	897	106.80	923	119.50						
83000	4318	839	72.20	866	84.40	892	96.90	918	109.80										
89000	4630	895	87.10	921	100.10														

RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	L_{WiA}
305	100	95	84	83	76	67	62	58	53	79
	85	94	81	80	71	64	60	56	53	76
	70	92	77	75	67	61	59	57	55	72
	50	87	75	73	68	61	60	60	59	71
444	100	103	97	92	88	80	73	68	64	90
	85	102	95	88	84	76	70	66	63	86
	70	100	93	84	79	73	69	66	64	83
	50	95	89	82	79	73	69	68	67	82

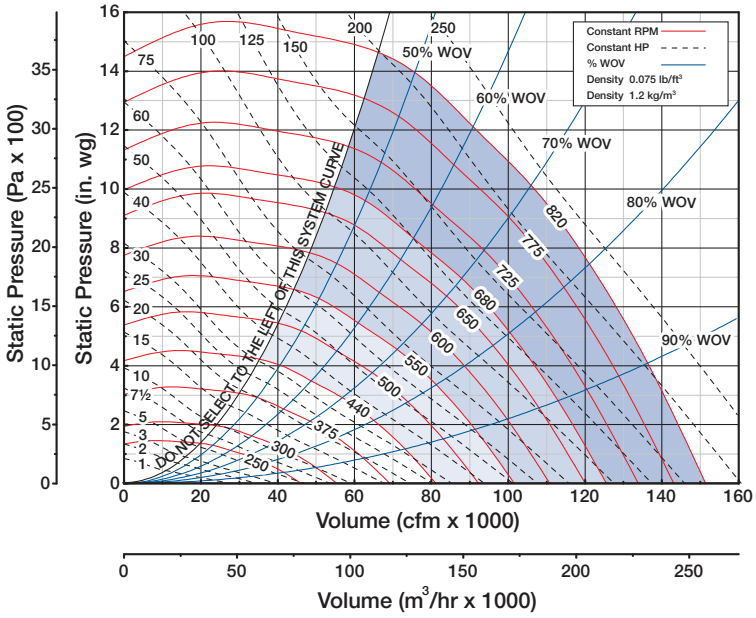
RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	L_{WiA}
629	100	103	111	99	99	92	82	78	73	101
	85	100	109	96	96	87	80	76	72	98
	70	98	107	93	91	83	77	75	73	95
	50	95	103	90	89	84	77	76	75	92
925	100	114	119	114	108	105	96	89	84	111
	85	112	118	112	104	100	92	86	83	109
	70	111	116	109	100	96	89	85	82	106
	50	106	111	106	98	95	89	85	84	103

Performance certified is for installation type B: Free inlet, Ducted outlet. Power ratings (Bhp) do not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories).

The AMCA Certified Ratings Seal applies to air performance ratings only.

Class I	Maximum rpm	440
Class II	Maximum rpm	550
Class III	Maximum rpm	680
Class IV	Maximum rpm	820

Wheel Diameter	73 inches
Minimum Starting HP	3 hp
Outlet Area	28.48 ft^2
Tip Speed	rpm x 19.12
Maximum BHP	$(rpm / 134)^3$
Approximate Weight	4500 lbs.



CFM	OV	STATIC PRESSURE (inches wg)																	
		1		2		3		4		5		6		8		10		12	
		RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
27000	948	237	5.43	308	10.78														
37000	1299	271	8.35	333	14.79	384	21.81	434	29.76										
47000	1650	312	12.20	364	20.30	412	28.40	456	37.10	494	46.20	534	56.20						
57000	2001	357	17.50	402	26.90	445	36.70	485	46.50	522	56.70	557	67.40	621	89.90	684	115.40		
67000	2352	404	24.40	443	35.10	481	46.30	517	58.00	553	69.40	585	81.10	646	105.80	701	131.70	756	160.00
77000	2703	453	33.20	488	45.20	521	57.90	554	70.80	585	84.30	617	97.30	675	124.10	729	152.40	778	181.70
87000	3054	504	44.30	534	57.60	565	71.50	594	86.00	623	100.60	651	115.70	707	145.50	757	175.80	806	207.40
97000	3405	555	57.90	582	72.50	610	87.70	637	103.50	663	119.60	690	135.90	739	169.60	789	202.60		
107000	3757	607	74.40	632	90.30	657	106.80	682	123.70	706	141.20	729	159.00	777	195.20				
117000	4108	659	93.90	682	111.20	704	128.90	728	147.20	750	165.90	772	185.00	816	224.00				
127000	4459	711	117.00	733	135.00	753	154.00	774	174.00	796	194.00	817	214.00						
137000	4810	763	143.00	784	163.00	803	184.00												
147000	5161	816	174.00																

RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	L_{WiA}
271	100	96	87	85	78	69	65	60	56	81
	85	94	84	81	73	66	63	59	55	77
	70	92	80	77	70	64	62	60	58	74
	50	88	78	75	70	64	64	63	62	74
394	100	107	99	95	90	81	75	71	66	92
	85	105	96	92	85	78	73	69	65	89
	70	103	94	87	82	75	72	69	67	86
	50	99	90	85	81	75	72	71	70	84

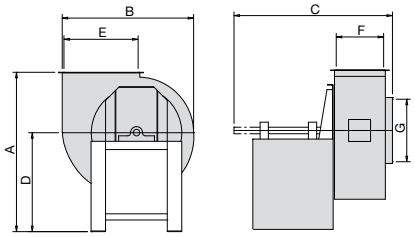
RPM	% WOV	Inlet Sound Power, L_{Wi} [dB ref 10^{-12} watts]								
		1	2	3	4	5	6	7	8	L_{WiA}
558	100	114	112	103	101	94	85	81	76	103
	85	113	110	100	97	89	82	79	75	100
	70	111	108	96	93	86	80	78	76	97
	50	106	104	93	91	86	80	79	78	94
820	100	117	123	115	111	107	98	91	87	114
	85	114	121	113	108	102	94	89	85	111
	70	113	119	110	103	98	91	88	85	108
	50	108	115	107	101	98	91	88	87	105

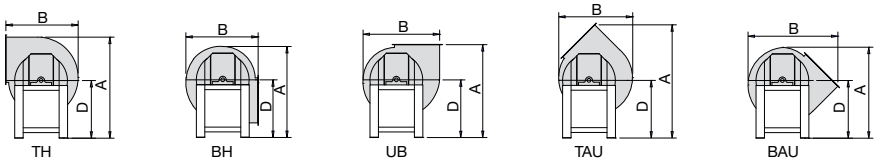
Performance certified is for installation type B: Free inlet, Ducted outlet. Power ratings (Bhp) do not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories).

The AMCA Certified Ratings Seal applies to air performance ratings only.

Arrangement 10 — Belt Drive

Sizes 6-25





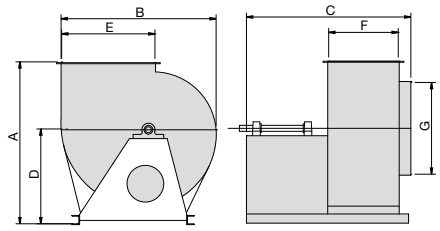
Fan Size	Class	A					B				C	D	E	F	G
		TH	BH	UB	TAU	BAU	TH BH	UB	TAU	BAU					
6	I, II, III, IV	28¼	25⅝	28	32⅜	27	18¾	18	17⅛	22½	28	18	5½	4⅞	6⅜
8		31⅜	28 3/16	29	35¼	28 5/16	22⅜	23⅜	22⅜	28⅛	29 13/16	18	7⅜	6½	8⅜
10		38¾	35	36	43	35 1/16	24¾	26	24½	30⅞	35⅜	24	9⅛	8⅛	10⅝
15		33	29⅝	29⅜	36½	28½	24¾	26½	24½	30¾	35½	24	15¾	11¾	14⅜
18		41½	37⅝	37⅜	45⅞	36¾	29	31⅛	29½	36 5/16	41¾	24	18⅝	13⅞	18½
22		45 9/16	40⅝	40 5/16	51	39 5/16	35¼	37⅜	35½	44⅜	44 13/16	24	22⅝	16⅞	20½
25		52¾	47⅛	46⅝	58½	45½	40⅜	43½	40⅞	51	51 7/16	28	26	19⅝	24⅝

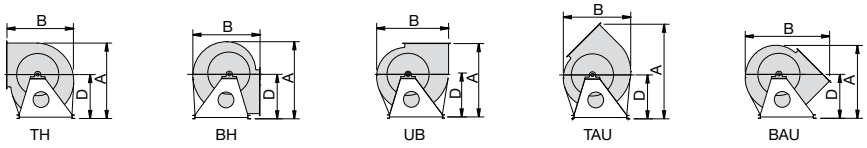
Arrangement 9 — Belt Drive

Sizes 30-73

Arrangement 9H — Belt Drive

Sizes 44-73

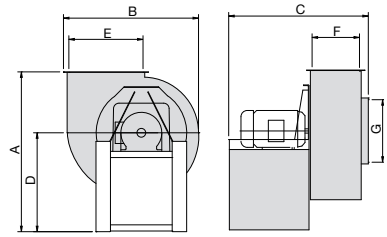


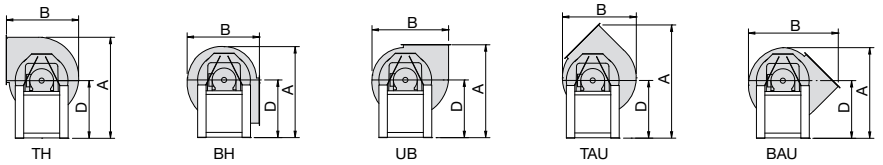


Fan Size	Class	A					B				C	D	E	F	G
		TH	BH	UB	TAU	BAU	TH BH	UB	TAU	BAU					
30	I, II, III, IV	59¾	59	53	67½	56 9/16	47½	51	48	60	53	31	30½	22¾	30⅝
36		71¾	71	63¾	80½	69 1/16	51⅝	61¼	58	72	61½	37	37⅛	27⅝	36⅜
44		86⅜	85	76 9/16	96⅞	82 7/16	61¼	75	70½	89	70	44	45¼	33¾	42½
48		94⅞	88⅛	85½	108½	85⅜	62⅛	82½	77	96	75½	50	49⅜	36¾	48⅝
54		104	100	95¾	121	97⅜	71½	91¾	86	108	81	56	55¼	41⅛	54⅞
60		113½	112¾	105⅞	134	109 1/16	80	101⅝	95½	119	86	62	61	45⅜	60⅞
73		134½	132½	125 7/16	159	129 3/16	90⅜	123½	118	147	106	72	74¼	55¼	72⅝

Arrangement 4 — Direct Drive

Sizes 6-25





Fan Size	Class	A					B				C	D	E	F	G
		TH	BH	UB	TAU	BAU	TH BH	UB	TAU	BAU					
6	I, II, III, IV	30¼	29⅝	28	33¾	27	18¾	20⅛	17¼	25¼	25	18	5½	4⅞	6⅜
8		33⅜	29⅝	29	36⅝	28 5/16	22⅜	25½	22⅞	29¾	26 13/16	18	7⅜	6½	8⅜
10		40¾	29⅝	36	44 5/16	35 1/16	24¾	28⅛	22½	32¼	31⅜	24	9⅛	8⅛	10⅝
15		33	29⅝	29⅜	36½	28½	24¾	29¼	24½	30¾	35½	18	15¾	11¾	14⅜
18		41½	37⅝	37⅜	45⅞	36¾	29	33⅞	29½	36 5/16	41¾	24	18⅝	13⅞	18½
22		45½	40⅝	40 5/16	51	39⅓	35¼	40⅛	35½	44⅜	44 13/16	24	22⅝	16⅞	20½
25		52¾	47⅛	46⅝	58½	45½	40⅜	46½	40⅞	51	51 7/16	28	26	19⅝	24⅝

Specifications

Model BCSW-FRP

Supply, exhaust, or return air fans shall be a single-width, single inlet type fan, in clockwise or counterclockwise rotation as specified.

The housing shall be constructed of fire resistant vinyl ester resins and conform to PS 12-96 FRP construction standards. All interior surfaces of the fan which are exposed to the airstream shall contain a layer of "C" grade glass veil and shall be resin rich. The exterior FRP surfaces of the housing shall be resin rich and stabilized against ultraviolet degradation and enhanced with "C" grade veil. The housing shall have a slip fit connection on the inlet and an unpunched flange on the outlet. Units up through size 25 shall have housings which are field rotatable to the five standard discharge positions. All hardware located within the airstream will be made of stainless steel and encapsulated in FRP. Housing and bearing support shall be constructed of welded structural steel members to prevent vibration and rigidly support the shaft and bearings and coated with enamel or epoxy to prevent corrosion.

The fan wheel shall be of the non-overloading, backward-curved, centrifugal type. Wheels manufactured from a FRP encapsulated steel hub and backplate with FRP blades strapped in for added strength. The shaft to impeller connection is external to the gas stream with the encapsulated hub extending out of the housing using a taper-lock bushing for the physical connection. Neither the shaft nor the shaft-impeller connection is exposed to the gas stream.

Wheels shall be statically and dynamically balanced with a maximum velocity of 0.078 in/sec for belt drive fans and 0.05 in/sec for direct drive fans. The wheel and fan inlet shall be carefully matched and shall have precise running tolerances for maximum performance and operating efficiency.

Additional Belt Drive Specification

Drive belts and sheaves shall be sized for 150% of the fan operating brake horsepower, and shall be readily and easily accessible for service, if required. For belt drive fans, an OSHA compliant belt guard and shaft guard shall be included to completely cover the sheaves and belt(s).

Fan shaft is to be turned and polished steel that is sized so that the first critical speed is at least 25% over the maximum operating speed for each pressure class.

Fan shaft bearings shall be air handling quality and shall be heavy-duty grease lubricated, self-aligning ball or roller pillow block type. Bearings shall be selected for a basic rating fatigue life L_{10} of 80,000 hours at maximum operating speed for each pressure class. The bearings shall be fixed to the fan shaft using concentric mounting locking collars, which reduce vibration, increase service life, and improve serviceability. Bearings that use set screws shall not be allowed. Bearings shall have zerk fittings to allow for lubrication.

Fans sizes 15 to 73 shall be licensed to bear the AMCA Seal for Air Performance.

FRP centrifugal fans shall be model BCSW-FRP and shall be supplied as shown on the plan and in the fan schedule.

Our Commitment

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

Product warranties can be found online at Greenheck.com, either on the specific product page or in the literature section of the website at Greenheck.com/Resources/Library/Literature.

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