



Job Name:

Customer:

Job ID:

Date: February 28, 2018

Vol Flow (CFM) 20,000 Static Pressure (in WC) 4.430

Temperature (°F) 70 Altitude (ft) 0 Density (lb/ft³) 0.075

#	Model	Size	Cl	%dia	%wid	%peak	Drive	RPM	Max RPM	Std BHP	Op BHP	OV FPM	SE	ME
1	BAE-DW	330	I	100	100	95.98	BD	1075	1261	17.18	17.18	1775	81.32	84.92
2	BAE-DW	300	I	100	100	86.86	BD	1243	1387	17.43	17.43	2148	80.13	85.32
3	BAE-DW	270	I	100	100	73.34	BD	1503	1541	18.43	18.43	2653	75.78	83.27
4	BAE-DW	245	II	100	100	64.08	BD	1803	2175	20.34	20.34	3221	68.66	78.66
5	BAE-DW	222	II	100	100	50.74	BD	2231	2395	23.13	23.13	3906	60.40	73.35
6	BAE-DW	200	III	100	100	39.00	BD	2883	3372	29.34	29.34	4831	47.61	63.22
7	BAE-DW	182	III	100	100	29.17	BD	3653	3695	36.43	36.43	5797	38.34	56.45

Sound Power Levels
(Inlet sound in dB ref 10-12w)

----- Octave Bands -----													
#	Model	Size	RPM	1	2	3	4	5	6	7	8	LwA	
1	BAE-DW	330	1075	90	97	92	84	81	78	71	66	89	
2	BAE-DW	300	1243	89	96	96	89	81	78	72	68	91	
3	BAE-DW	270	1503	90	97	101	98	85	81	76	71	94	
4	BAE-DW	245	1803	94	95	103	98	87	84	80	76	97	
5	BAE-DW	222	2231	93	89	106	100	89	85	81	79	100	
6	BAE-DW	200	2883	100	100	104	107	104	93	89	86	107	
7	BAE-DW	182	3653	103	103	105	110	110	98	94	91	110	

Definitions:

LwA The overall (single power) fan sound power level, 'A' weighted



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AMCA Statements

Selection #: 1, 2, 3, 4, 5, 6, 7

1. Twin City Fan certifies that the model BAE-DW is 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.
2. Performance certified is for Installation Type B & D: Free or ducted inlet, Ducted outlet.
3. Power rating (KW) does not include transmission losses.
4. The sound power level ratings shown are in decibels, referred to 10 E-12 watts calculated per AMCA Standard 301.
5. Values shown are for inlet Lwi and LwiA, and outlet Lwo and LwoA sound power levels for Installation Type B: Free inlet, Ducted outlet.
6. Ratings do not include the effects of duct end correction.
7. The A-weighted sound ratings shown have been calculated per AMCA Standard 301.
8. dBA levels are not licensed by AMCA International.



FAN DETAILS



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Description	Performance	Air/Gas Properties
Quantity 1	Volumetric Flow (CFM) 20,000	Altitude above sea level (ft) . . 0
Model BAE-DW	Operating SP (in WC) 4.430	Inlet Pressure (in WC) 0.00
Size 245	Standard SP (in WC) 4.430	Inlet Temperature (°F) 70
Width DWDI	RPM 1803	Design Temperature (°F) . . . 70
Arrangement 3	Tip Speed (FPM) 11565	Gas Type Standard
Class II	Oper. Power (BHP) 20.34	Estimated Density (lb/ft³) 1
Rotation W/A	Standard Power (BHP) 20.34	
Discharge W/A	Outlet Area (sq.ft) 6.21	
Wheel Diameter (in) 24.5	Outlet Velocity (FPM) 3221	
Drive method Belt	Max RPM for Class . . 2175	
Percentage width . . . 100%	Static Efficiency 68.66%	
Percentage diameter 100%	Total Efficiency 78.66%	
Motor position WA	FEI 1.26	
	FEP (KW) 16.89	
	System FEI N/A	
	System FEP (KW) N/A	
	Temperature Rise	
	Sens. Heat Rel.	

FAN DETAILS



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Sound

Sound Power Levels:

Octave Bands	1	2	3	4	5	6	7	8	LwA
Level at Inlet	94	95	103	98	87	84	80	76	98
Level at Outlet	101	101	100	95	91	86	81	77	97

Directivity Factor

Estimated overall Sound Pressure levels:

Sound Pressure levels cannot be guaranteed.

Definitions:

- LwA** The overall (single value) fan sound power level 'A' weighted. A-weighting attempts to match the response ear to noise.
- dBA** The environment for each fan installation influences its measured sound value, therefore dBA levels cannot be guaranteed. Consult AMCA Publication 303 for further details.
A fan's dBA is influenced by nearby reflective surfaces.

Directivity Factor (Q)

-The Directivity Factor (Q) is a dimensionless quantity that is a measure of the degree to which sound emitted by a source is concentrated in a certain direction rather than radiated uniformly in a spherical pattern. Directivity factors for radiation patterns associated with various surfaces surrounding a sound source are shown below. Basically, each radiation pattern is a portion of a spherical radiation pattern; that is, a fraction of the area of a sphere ($4\pi R^2$). The relationship between L_p and L_w is also provided for each radiation pattern, as simplified from the previous equation.

Sound Power level: -Sound power level or acoustic power level is a logarithmic measure of the sound power in comparison to a specified reference level. While sound pressure level is given in decibels SPL, or dB SPL, sound power is given in dB SWL. The dimensionless term "SWL" can be thought of as "sound watts level,"[1] the acoustic output power measured relative to a very low base level of watts given as 10^{-12} or .000000000001 watts.

Sound pressure level: -Sound pressure or acoustic pressure is the local pressure deviation from the ambient (average, or equilibrium) atmospheric pressure caused by a sound wave.

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DOE Statements

Note that the Fan Energy Index (FEI) is an overall efficiency (wire-to-air) metric which includes not only the impact of the fan efficiency, but also each of the drive components used to operate the fan.

The Fan Electrical Input Power (FEP) is the amount of power of a given fan at an operating point characterized by a value of flow and pressure.

SPECIFICATION

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Model: BAE-DW

Fans shall be Type BAE Airfoil, as manufactured by Twin City Fan & Blower, Minneapolis, Minnesota.

PERFORMANCE - Performance ratings shall conform to AMCA Standard 205 (fan efficiency grade), 211 (air performance) and 311 (sound performance). Fans shall be tested in accordance with ANSI/AMCA Standard 210 (air performance) and 300 (sound performance) in an AMCA accredited laboratory. Fans shall be licensed to bear the AMCA certified ratings seal for both sound and air, and fan efficiency grade (FEG). Sound certification shall apply to both inlet and outlet sound power levels.

Fans shall have a sharply rising pressure characteristic extending through the operating range and continuing to rise beyond the peak efficiency to ensure quiet and stable operation. Fans shall have a non-overloading design with self-limiting horsepower characteristics and shall reach a peak in the normal selection area. All fans shall be capable of operating over the minimum pressure class limits as specified in AMCA Standard 99.

HOUSING - BAE fan housings shall be of heavy gauge, continuously welded construction. Housings with lock seams or partially welded construction are not acceptable. Housings shall be suitably braced to prevent vibration or pulsation. Housings shall have spun, aerodynamically designed inlet cones or inlet venturies for smooth airflow into the wheels.

WHEEL - Wheels shall have a precision spun, flat inlet cone to allow higher efficiencies over the performance range of the fan. Sizes 245 and smaller shall have airfoil-shaped, extruded aluminum blades. Sizes 270 and larger shall have die-formed airfoil steel blades with the option of extruded aluminum blades. All hollow blade wheels shall be continuously welded around all edges. All wheels shall be statically and dynamically balanced on precision electronic balancers to a Balance Quality Grade G6.3 per ANSI/AMCA 204 or better.

SHAFT - Shafts shall be AISI 1040 or 1045 hot rolled steel, accurately turned, ground, polished, and ring gauged for accuracy. Shafts shall be sized for the first critical speed of at least 1.43 times the maximum speed.

BEARINGS - Bearings shall be heavy duty, grease lubricated, spherical roller or adapter mounted anti-friction ball, self-aligning, pillow block type and selected for a minimum average bearing life (AFBMA L-50) in excess of 200,000 hours at the maximum fan RPM.

DRIVE - Motor sheaves shall be cast iron, variable pitch on applications 10 HP and smaller, and fixed pitch on 15 HP and larger. Drives and belts shall be located external to the fan casing and rated for 150% of the required motor HP.

FINISH AND COATING - The entire fan assembly, excluding the shaft, shall be thoroughly degreased and deburred before application of a rust-preventative primer. After the fan is completely assembled, a finish coat of paint shall be applied to the entire assembly. The fan shaft shall be coated with a petroleum-based rust protectant.

ACCESSORIES - When specified, accessories such as belt guards, weather covers, access doors, companion flanges, variable inlet vanes, outlet dampers, inlet boxes, shaft coolers, shaft seals, inlet screens, etc., shall be provided by Twin City Fan & Blower to maintain one source responsibility.

When specified, fans shall be supplied with internal or nested type variable inlet vanes for wheel diameters 161/2" and larger. Cantilevered vane blades are to be used through Size 660 to minimize air performance insertion losses and noise. The operating mechanism shall be out of the inlet airstream. Double width fans shall have interconnecting linkage to ensure operation in unison.

FACTORY RUN TEST - All fans prior to shipment shall be completely assembled and test run as a unit at the specified

SPECIFICATION



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operating speed or maximum RPM allowed for the particular construction type. Each wheel shall be statically and dynamically balanced in accordance with ANSI/AMCA 204 "Balance Quality and Vibration Levels for Fans" to Fan Application Category BV-3, Balance Quality Grade G6.3. Balance readings shall be taken by electronic type equipment in the axial, vertical, and horizontal directions on each of the bearings. Records shall be maintained and a written copy shall be available upon request.

GUARANTEE - The manufacturer shall guarantee the workmanship and materials for its BAE airfoil fans for at least one (1) year from startup or eighteen (18) months from shipment, whichever occurs first.

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