

Mine Duty Blowers and Heaters

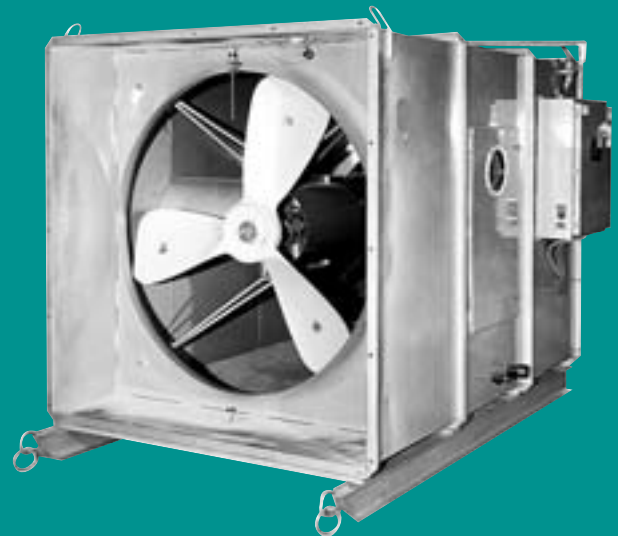
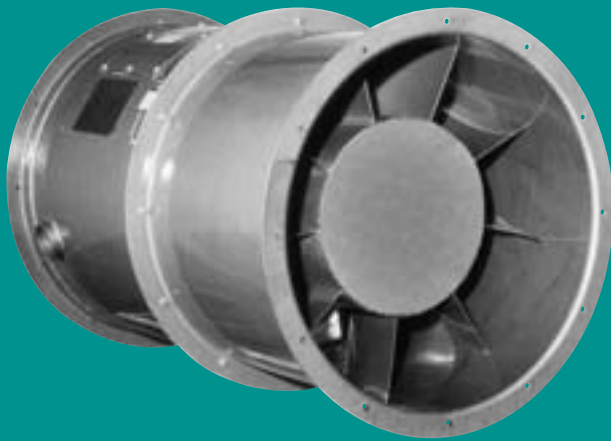
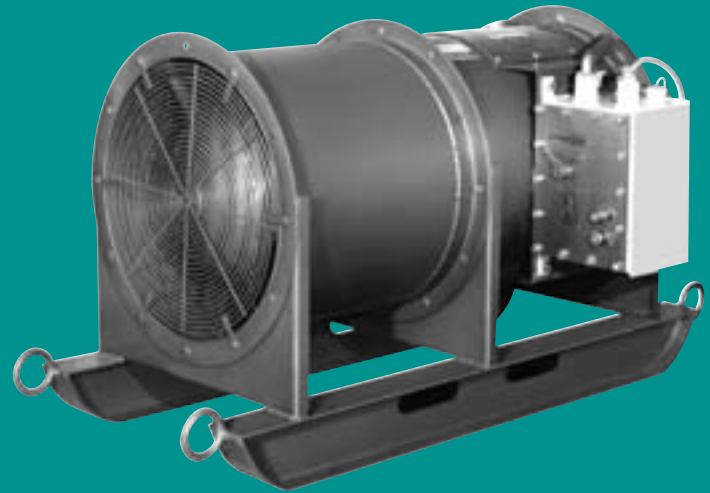
Series 44(V)

Series 50

Series 56

Series 51

Series 811



HARTZELL®

Hartzell Fan, Inc., Piqua, Ohio 45356
www.hartzellfan.com

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Certified Ratings for Air Performance

Hartzell Fan, Inc. certifies that the Series 44 Special Duty Direct Drive Duct Axial Fan and Series 44V Special Duty Direct Drive Duct Vaneaxial Fan shown on pages 6 and 7, and Series 50 Special Duty Direct Drive Vaneaxial Fan, Type VA shown on pages 8 and 9 are licensed to bear the AMCA Seal for Air Performance. 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.

This bulletin lists Hartzell's complete line of Marine Duty Blowers and accessories. More than 70 Hartzell offices can provide specific performance and installation data to meet your requirements. Call your Hartzell representative for assistance. Visit our website (www.hartzellfan.com) or call toll-free for the name of your Hartzell representative...

1-800-336-3267



Mine Blower Selection

You can select your Mine Duty Blowers from Hartzell's complete line. Blower requirements may vary greatly from mine to mine. The Hartzell Mine Blower Selection Guide on page 5 may be reproduced and completed for each item on your blower list (and included in the specification) to ensure proper equipment selection.

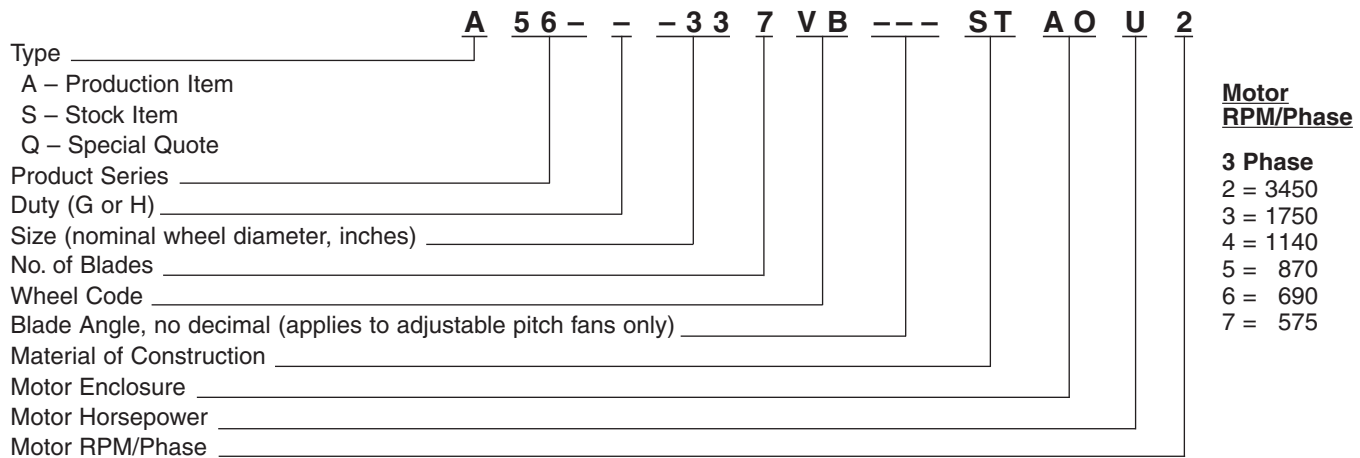
Note that the blower performances shown on the following pages are based on standard air conditions (sea level, 70°F, and 29.92-in. barometric pressure). High temperature air requirements must be corrected to standard air. And, special motor insulation may be required for ambient temperatures in excess of 105°F.

When placing your order, be sure to specify the Hartzell Model Code. The following example demonstrates our coding system. The illustrated series number specifies a Series 56 Special Duty Vaneaxial Blower (Type VB).

Be sure to include your performance requirements and voltage as well as a list of accessory items, if required. (See pages 16 and 17.)

Contact your local Hartzell Sales Representative for assistance.

Hartzell Model Code Specification



Motor Horsepower

Horsepower	1/4	1/3	1/2	3/4	1	1 1/2	2	3	5	7 1/2	10	15	20	25	30	40	50	60	75	100	125	150	200
Code Letter	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

How To Use Model Code Index:

Example – Assume the required performance to be 27,200 CFM at 6" SP, standard air. Reading across the Series 56 Rating Table on page 10, we find a 33" vaneaxial blower with RPM of 3560 and brake horsepower (BHP) of 51.43. Required motor horsepower is 60.

The model code can be constructed as follows: Type will be production item (code A), product series for the Special Duty Direct Drive Duct Vaneaxial Fan, Type VB is 56, size of the wheel

is 33", number of blades on the fan is 7, blade code for this item is VB, material of construction is steel (code ST), motor enclosure is totally enclosed, air over (code AO), motor horsepower is 60 (code U), and motor RPM/phase is 3560 (code 2).

Note:

All other informational fields must be filled with hyphens/dashes (-) if they are not applicable to the fan being considered.



Construction Features

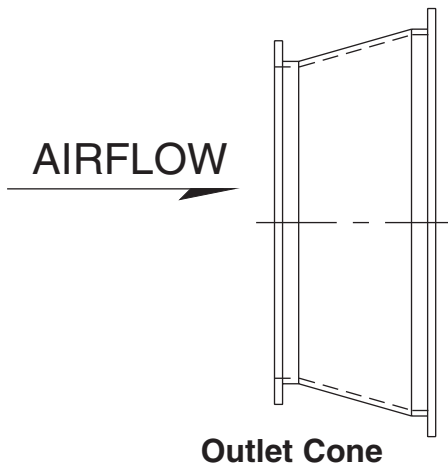
All Hartzell Mine Blowers are constructed to meet or exceed industry standards. Standard construction and materials are as follows:

- Housings are extra heavy, with barstock flanges continuously welded to the steel drum. Separate guide vane sections are continuously welded, with rolled steel flanges and nine steel vanes welded into exact position. Stainless steel nameplates are standard.
- Standard finish is Hartzell air dry enamel.
- Impellers are true airfoil design, solid aluminum alloy casting. Impellers can be hard coat anodized to provide improved abrasion resistance.
- Motors are totally enclosed air over type as standard. Mine duty motors certified to meet explosion proof and other standards are available. Motors are pre-wired with electrical leads extended to conduit boxes located on the exterior of the fan housing.

Motors supplied with relubricable bearings include extended lubrication tubes and lubrication fitting guard as standard.

- Blowers are designed for mounting in any position from horizontal to vertical.
- Motors to meet your specifications such as explosion proof, extra tough, high temperature are available.
- Non-sparking construction (AMCA Type B) is standard when purchased with an XP motor. Other types of construction available upon request.
- A complete selection of accessory items is available. Refer to pages 16 and 17.
- Special coatings and finishes are available. Refer to page 18.
- Complete sound power level information in eight octave bands is available.

Effects of Using Evasé



Ratings shown in this bulletin are for Mine Blowers with inlet and outlet ducts of the same diameter as the blower. Discharge cones may be used on the blower to adapt to larger diameters (see Fig. A). This results in a static pressure regain.

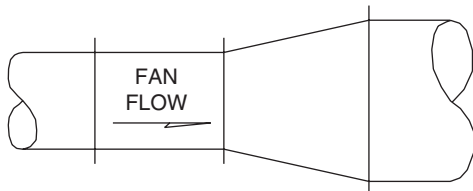


Fig. A

Table 1 shows the amount of additional static pressure capability, which results from using the discharge cone. Add the amount of .45(VP1-VP2) to the blower's static pressure.

$$SP2 = SP1 + .45 (VP1-VP2)$$

Thus a blower selected for 4000 FPM O.V. at 2" S.P. using a size 18"-21" cone, the static pressure capability would be 2" + .207" = 2.207" static pressure. Regain calculations are approximate and are not part of the AMCA Certified Ratings.

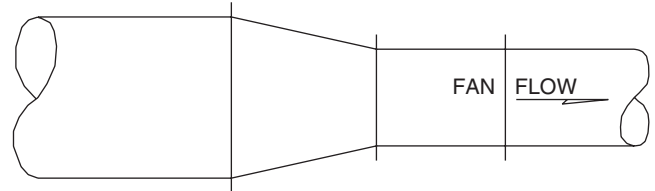


Fig. B

Discharge cones may also be used to transform large ducts to the blower inlet size (see Fig. B). Since these cones have gently tapered sides, the friction loss is negligible about .08 x the difference in velocity pressures.

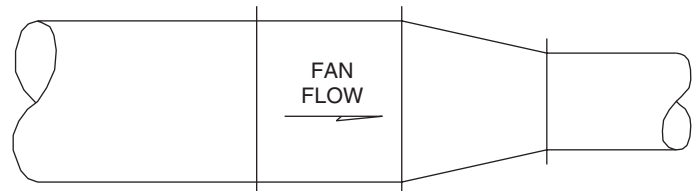


Fig. C

If the blower is to be used with ducts smaller in diameter than the blower (see Fig. C), the difference in velocity pressure across the cone must be added to the pressure for which the blower is selected.

Table 1

Additional Static Pressure Capability (Regain) Inches W.G.

F.P.M. Velocity	Pressure Inches	F.P.M. Velocity	Pressure Inches	F.P.M. Velocity	Pressure Inches
1000	.012	2750	.099	4500	.261
1250	.020	3000	.117	4750	.290
1500	.029	3250	.138	5000	.323
1750	.040	3500	.160	5250	.356
2000	.052	3750	.183	5500	.392
2250	.065	4000	.207	5750	.428
2500	.081	4250	.233	6000	.467

Note – For an included cone angle of 25°- 30°



Hartzell Mine Blower Selection Guide

CUSTOMER _____ DATE _____
 CUSTOMER JOB REF. _____ HARTZELL REP. _____
 TYPE OF MINE _____ SPEC. ENGR. _____

ITEM #	MOTOR DATA
LOCATION _____	HP _____
MOUNTING POSITION _____	RPM/No. of Windings _____
NO. OF BLOWERS (REQ'D) _____	Voltage/Cycle/Phase _____
BLOWER SIZE _____	Service Factor _____
REQUIRED BLOWER PERFORMANCE:	MOTOR DUTY:
CFM _____	Standard _____
SP ("WG) _____	Explosion Proof _____
or TP ("WG) _____	Class _____
BHP _____	Group _____
RPM _____	Div _____
BLOWER SELECTION:	Energy Efficient _____
Hartzell Model _____	Mill & Chemical _____
Pattern # _____	ENCLOSURE _____
Curve # _____	FRAME MATERIAL:
dB _A at 5' _____	Ductile (Nodular) _____
CFM _____	Cast Iron _____
SP ("WG) _____	Steel _____
or TP ("WG) _____	Aluminum _____
BHP _____	INSULATION CLASS:
RPM _____	A _____
REQUIREMENTS:	B _____
NON-SPARKING CONST. _____	F _____
GUARDS _____	H _____
INLET CONE _____	Other _____
OUTLET CONE _____	B-10 BEARING LIFE (Hours):
VIBRATION ISOLATORS _____	40,000 _____
LIFTING LUGS _____	100,000 _____
MOUNTING FEET _____	Other _____
SKID _____	Thermal Protectors _____
SOUND MUFFLER _____	SPACE HEATER _____
ACCESS DOOR _____	AMBIENT TEMPERATURE (°C):
SPECIAL COATINGS:	40 _____
NUPON _____	55 _____
DIMETCOTE _____	65 _____
HOT DIP GALV. _____	TEMPERATURE RISE (°C) _____
SPECIAL ITEMS: _____	



Mine Duct Axial Blowers (DA)

(Vane Section Optional – DVA)



Series 44



Hartzell Fan, Inc. certifies that the Series 44, Special Duty Direct Drive Duct Axial and Series 44V, Special Duty Direct Drive Duct Vaneaxial fans shown hereon are licensed to bear the AMCA Seal. 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.

The DA wheel used in the duct axial line is an airfoil design, 6-bladed, one-piece impeller cast of aluminum and is the result of many years of research and development. It combines the best features of a vaneaxial impeller and the economical performance of a Hartzell duct fan propeller. Its design is rugged; its function is to move large volumes of air at medium static pressures of 1" to 4".

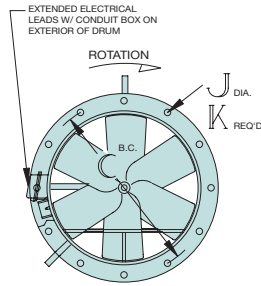
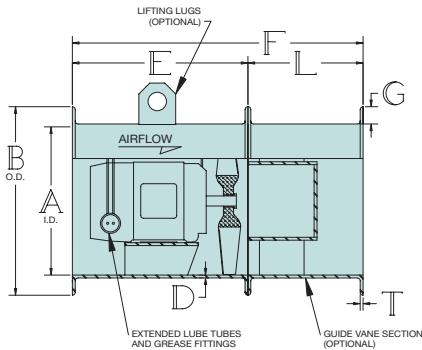


Series 44 DA Mine Duty Duct Axial Blowers

Hartzell's heavy-duty line of direct drive mine duct axial blowers is available in sizes 12" through 60". Air deliveries range from 300 to 91,920 CFM. Units operate efficiently up to 3" static pressure. The DA blower is a duct axial fan type combining the best features of the rugged, highly efficient vaneaxial blower and the economical performance of a duct fan. The wheel design, however, is completely original. Rigid motor mounts provide support for the foot mounted totally enclosed air over motor that is furnished as standard. DVA blowers have a vane section for increased performance at 1" to 4" static pressure with the same or less horsepower. (See page 4 for standard construction features.)

Vane Section

The addition of a specially designed vane section to DA blowers changes the design configuration to a DVA blower. Adding the vane section on the discharge side of a DA blower makes it perform efficiently as a low powered vaneaxial on the upper side of the pressure curve. Near free air, the vane section offers no advantages, but beyond the mid-range, the blower with the vane section added provides up to 30% more static pressure with the same horsepower.

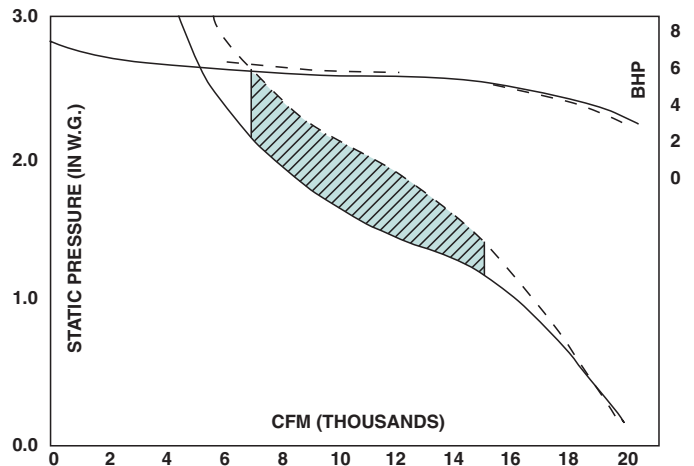


The chart shows the comparative performance of a typical DVA blower with a vane section and a DA blower without a vane section. A 36" direct drive DA and DVA with a 5 HP, 1160 RPM motor are used in the graphic example. At free air delivery up to .8" SP, the chart reveals that the guide vanes do very little good. However, in the true working range of the blower (see the shaded area on the curve), the guide vanes make an important difference in the SP rise of the blower with practically no difference in HP. At 11,000 CFM, for example, the DA without the vane section reaches 1.50" SP. However, the DVA blower with the vane section delivers 11,000 CFM at 2.0" SP—a gain of about 30%. The power remains approximately constant.

Principal Dimensions – Series 44

Fan Size	A	B	C	D	E	F	G	J	K	L	T	Max. Motor Frame
12	12 ⁷ / ₈	16 ⁷ / ₁₆	15 ¹ / ₈	1/4	15	21	1 1/2	9/16	12	6	1/4	56
14	14 ⁷ / ₈	18 ⁷ / ₁₆	17 ¹ / ₈	1/4	15	25	1 1/2	9/16	12	10	1/4	182T
16	16 ⁷ / ₈	20 ⁷ / ₁₆	19 ¹ / ₈	1/4	15	25	1 1/2	9/16	12	10	1/4	184T
18	18 ⁷ / ₈	22 ⁷ / ₁₆	21 ¹ / ₈	1/4	15	26	1 1/2	9/16	12	11	1/4	184T
24	24 ⁷ / ₈	29 ⁷ / ₁₆	27 ⁵ / ₈	1/4	23	36	2	9/16	12	13	1/4	184T
28	28 ⁷ / ₈	33 ⁷ / ₁₆	31 ⁵ / ₈	1/4	23	36	2	9/16	12	13	1/4	184T
32	33	37 ⁹ / ₁₆	35 ³ / ₄	1/4	24	39	2	9/16	12	15	1/4	215T
36	37	41 ⁹ / ₁₆	39 ³ / ₄	1/4	28	44	2	9/16	12	16	1/4	256T
40	41	45 ⁹ / ₁₆	43 ³ / ₄	1/4	30	48	2	9/16	12	18	1/4	286T
44	45	49 ⁹ / ₁₆	47 ³ / ₄	1/4	32	51	2	9/16	12	19	1/4	326T
48	49 ¹ / ₈	54 ¹ / ₁₆	52 ³ / ₈	1/4	36	58	2 1/2	9/16	12	22	1/4	365T
54	55 ³ / ₈	61 ³ / ₁₆	59	3/8	40	63	2 1/2	9/16	12	23	3/8	365T
60	61 ³ / ₈	67 ³ / ₁₆	65	3/8	40	65	2 1/2	9/16	12	25	3/8	365T

DA & DVA – 36" Direct Drive 1160 RPM – 5HP



Rating Table – Series 44 – Special Duty Duct Axial, (Mine Duty), Wheel Type DA

Size	Model	Motor (Fan)		CFM @ Static Pressure													
				0"		½"		1"		1½"		2"		2½"		3"	
		HP	RPM	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
12	44---126DA--STAIG2	¾	3450	2308	0.35	2035	0.46	1716	0.57	797	0.64	446	0.78				
	44---126DA--STAI D3	¾	1725	1154	0.04	223	0.10										
16	44---166DA--STAIK2	3	3500	5831	1.86	5603	2.08	5348	2.34	5056	2.65	4719	2.92	4277	3.11	3145	3.20
	44---166DA--STAI F3	½	1725	2874	0.22	2304	0.35	1069	0.49								
18	44---186DA--STAIL2	5	3500	8155	2.59	7873	2.96	7565	3.33	7225	3.71	6837	4.09	6368	4.44	5649	4.68
	44---186DA--STAIG3	¾	1725	4019	0.31	3345	0.50	1496	0.64	829	0.81						
	44---186DA--STAI F4	½	1140	2656	0.09	820	0.20										
24	44---246DA--STAIK3	3	1760	9126	1.20	8346	1.72	7433	2.17	4690	2.57	3126	2.96	2265	3.37		
	44---246DA--STAI H4	1	1150	5963	0.34	4592	0.65	1644	0.90								
28	44---286DA--STAIL3	5	1750	14559	2.87	13653	3.64	12662	4.12	11438	4.70	8359	5.11	6408	5.69		
	44---286DA--STAI J4	2	1160	9650	0.84	8193	1.24	4587	1.56	2774	2.05						
32	44---326DA--STAIN3	10	1765	21884	5.22	20730	6.49	19622	7.66	18510	8.74	17135	9.59	14768	10.19	10179	10.96
	44---326DA--STAI K4	3	1160	14382	1.48	12671	2.27	10544	2.84	5776	3.42						
36	44---366DA--STAI P3	20	1765	30514	8.85	29466	10.36	28311	11.94	27000	13.65	25523	15.25	23872	16.45	21537	17.38
	44---366DA--STAIL4	5	1160	20055	2.51	18346	3.54	16109	4.55	10745	5.13						
40	44---406DA--STAIR3	30	1780	42443	17.48	41207	19.87	39918	21.96	38581	23.59	37170	24.89	35627	26.25	33856	28.09
	44---406DA--STAI N4	10	1180	28137	5.09	26220	6.55	24094	7.45	21324	8.68	14055	9.31	11417	10.67		
	44---406DA--STAIL5	5	870	20745	2.04	18034	2.93	11846	3.63	7445	4.57	4340	5.63				
44	44---446DA--STAI S3	40	1775	55468	27.19	54295	30.25	53047	33.25	51704	36.19	50226	39.09	48605	41.84	46821	44.34
	44---446DA--STAI O4	15	1180	36875	7.99	35037	10.00	32836	11.92	30128	13.48	26524	14.34	18660	15.20	15648	17.12
	44---446DA--STAI M5	7½	870	27187	3.20	24494	4.66	20574	5.67	12440	6.48	9053	7.86				
48	44---486DA--STAI V3	75	1780	71914	42.08	70645	46.04	69310	49.95	67897	53.79	66379	57.59	64734	61.31	62955	64.86
	44---486DA--STAI P4	20	1175	47471	12.10	45483	14.70	43187	17.20	40434	19.50	37172	21.06	31737	21.88		
	44---486DA--STAI N5	10	870	35149	4.91	32299	6.81	28430	8.36	19840	9.03	14446	10.77				
54	44---546DA--STAI S4	40	1180	67531	21.90	65337	25.60	62907	29.20	60116	32.69	56899	35.79	53234	37.95	48480	39.34
	44---546DA--STAI P5	20	870	49790	8.78	46684	11.47	42747	13.98	37641	15.54	25773	16.55	20646	19.12	16529	21.57
	44---546DA--STAI N6	10	690	39488	4.38	35284	6.48	28961	7.83	17127	9.23	11997	11.20				
60	44---606DA--STAI U4	60	1175	91864	36.37	89440	41.42	86815	46.35	83903	51.19	80629	55.80	76957	59.83	72873	62.77
	44---606DA--STAI R5	30	870	68018	14.76	64635	18.47	60585	22.01	55603	24.89	49006	26.50	34501	28.06	28913	31.60
	44---606DA--STAI P6	20	690	53946	7.37	49451	10.27	43301	12.61	29275	13.67	21648	16.41	15995	19.04	11516	22.24

Performance certified is for installation Type D: ducted inlet/ducted outlet. Performance ratings do not include the effects of appurtenances (accessories). See page 3 for the complete Hartzell Model Code Explanation and example.

Rating Table – Series 44V – Special Duty Duct Axial, (Mine Duty), Wheel Type DA, With Guide Vanes

Size	Model	Motor (Fan)		CFM @ Static Pressure													
				1"		1½"		2"		2½"		3"		3½"		4"	
		HP	RPM	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
12	44V--126DA--STAIG2	¾	3450	1763	0.52	1388	0.61	673	0.72								
	44V--166DA--STAIK2	3	3500	5382	2.49	5142	2.79	4886	3.09	4598	3.38	4245	3.64				
16	44V--166DA--STAI F3	½	1725	1215	0.50												
	44V--186DA--STAIL2	5	3500	7525	3.31	7236	3.63	6918	3.96	6555	4.27	6106	4.51	5420	4.75	4404	4.84
18	44V--186DA--STAIG3	¾	1725	2072	0.58	1098	0.79										
	44V--246DA--STAIK3	3	1760	7483	2.05	6479	2.39	4418	2.61	2979	3.12						
	44V--246DA--STAI G4	¾	1140	2100	0.81												
24	44V--286DA--STAIL3	5	1750	12743	4.11	11840	4.60	10739	5.01	9153	5.41						
	44V--286DA--STAI J4	2	1160	6608	1.53	3384	1.90										
32	44V--326DA--STAIN3	10	1765	19741	7.21	18762	8.23	17672	9.07	16429	9.79	14973	10.53	12525	11.10		
	44V--326DA--STAI K4	3	1160	11113	2.70	8367	3.14										
36	44V--366DA--STAI P3	20	1765	28278	12.01	27125	13.34	25895	14.56	24660	15.79	23348	16.97	21819	18.01	19989	18.90
	44V--366DA--STAIL4	5	1160	16511	4.36	14400	5.10	10223	5.48								
40	44V--406DA--STAIR3	30	1780	39626	20.89	38501	22.91	37354	24.70	36159	26.30	34871	27.67	33475	28.88	31914	30.03
	44V--406DA--STAI N4	10	1180	24331	7.46	22358	8.35	19817	9.14	15187	9.81	10580	11.11				
	44V--406DA--STAIL5	5	870	15284	3.56	9014	4.15	5588	5.34								
44	44V--446DA--STAI S3	40	1775	53213	31.76	51995	34.48	50724	37.51	49385	40.56	47963	43.49	46406	45.48		
	44V--446DA--STAI O4	15	1180	33259	11.49	31077	13.26	28420	14.09	25185	15.13	20168	15.93	15100	17.13		
	44V--446DA--STAI M5	7½	870	21627	5.56	17025	6.29	10316	7.14								
48	44V--486DA--STAI V3	75	1780	69489	47.81	68187	51.28	66840	54.97	65441	58.93	63978	62.89	62438	66.70	60783	69.58
	44V--486DA--STAI P4	20	1175	43582	16.48	41336	19.06	38725	20.70	35631	21.68						
	44V--486DA--STAI N5	10	870	29391	8.22	25165	9.06	18011	9.87	12289	11.43						
54	44V--546DA--STAI S4	40	1180	63267	27.83	60894	31.53	58308	35.12	55367	37.31	52002	38.63	48190	40.49	43715	42.55
	44V--546DA--STAI P5	20	870	43622	13.63	39577	15.26	34414	16.52	25979	17.60	18832	19.59	14553	22.44		
	44V--546DA--STAI N6	10	690	30723	7.69	22555	8.69	13622	10.26								
60	44V--606DA--STAI U4	60	1175	87179	44.19	84617	49.00	81896	54.06	78961	58.82	75678	61.72	72020	63.66	67960	65.77
	44V--606DA--STAI R5	30	870	61362	21.22	57348	24.49	52462	26.02	46515	27.94	37330	29.43	27929	31.61		
	44V--606DA--STAI P6	20	690	44843	12.40	38077	13.70	26367	14.92	18153	17.49	12881	20.75				

Performance certified is for installation Type D: ducted inlet/ducted outlet. Performance ratings do not include the effects of appurtenances (accessories). See page 3 for the complete Hartzell Model Code Explanation and example.



Mine Vaneaxial Blowers (Type VA)



Series 50



Hartzell Fan, Inc. certifies that the Series 50, Special Duty Direct Drive Vaneaxial Fan, Type VA, shown hereon is licensed to bear the AMCA Seal. 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.



Series 50 VA Mine Duty Vaneaxial Blowers

Hartzell direct drive mine duty VA vaneaxial blowers are available in sizes 12" to 60". Air deliveries range from 1930 to 123,000 CFM. Units are designed to be used from 2" to 5" static pressure. Their rugged, two-piece design makes them a natural for this application. Housings are heavy gauge welded steel with one section containing support the cast aluminum shell and motor. Rigid motor mounts provide support for the foot mounted totally enclosed air over motor that is furnished as standard. The second section contains the vanes, which are aerodynamic in design to straighten out airflow. The vanes are welded to the inner and outer shells forming a rigid section. (See page 4 for standard construction features.)

The VA wheel used in the Hartzell vaneaxial line is an airfoil design, 7-bladed, one-piece impeller developed and proven after many years of tests and thousands of installations. It is scientifically designed to move large volumes of air at high pressures. The large hub prevents backflow of air, which is an important feature in the design of this wheel.

Rating Table – Series 50 – Special Duty Direct Drive Vaneaxial, (Mine Duty), Wheel Type VA

Size	Model	Motor (Fan)		CFM @ Static Pressure															
				0"		½"		1"		1½"		2"		2½"		3"			
				HP	RPM	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
12	50---127VA---STAIH2	1	3450	2480	0.80	2317	0.87	2143	0.92	1928	0.97	1620	0.99						
18	50---187VA---STAIM2	7½	3500	7939	4.45	7723	4.74	7506	5.02	7288	5.30	7066	5.58	6837	5.85	6595	6.10		
21	50-M-217VA---STAI02	15	3500	12664	9.69	12411	10.15	12158	10.60	11905	11.06	11650	11.51	11391	11.95	11128	12.39		
26	50---267VA---STAIL3	5	1750	12606	4.00	12039	4.41	11479	4.75	10837	5.14	10118	5.45	9235	5.61				
29	50---297VA---STAIN3	10	1760	18768	6.43	18036	6.98	17258	7.46	16533	8.02	15951	8.76	15250	9.46	14185	9.87		
36	50---367VA---STAIR3	30	1780	36449	19.73	35549	20.80	34640	21.84	33671	22.75	32743	23.75	31900	24.93	31189	26.38		
	50---367VA---STAIM4	7½	1180	24163	5.75	22786	6.44	21390	7.10	20308	8.06								
42	50---427VA---STAIU3	60	1780	58009	42.80	56958	44.50	55909	46.20	54820	47.78	53688	49.22	52588	50.77	51554	52.50		
	50---427VA---STAIU4	20	1175	38293	12.31	36702	13.43	35008	14.42	33471	15.60	32252	17.18	30363	18.38	28196	19.22		
48	50---487VA---STAIW3	100	1780	86397	83.14	85196	85.67	83997	88.19	82799	90.72	81534	92.99	80240	95.14	78968	97.38		
	50---487VA---STAIS4	40	1180	57274	24.22	55465	25.90	53577	27.43	51676	28.95	49978	30.80	48596	33.15	46949	35.37		
54	50---547VA---STAIZ3	200	1785	123575	151.53	122228	155.14	120881	158.75	119536	162.37	118191	165.99	116761	169.18	115306	172.25		
	50---547VA---STAIW4	75	1185	82037	44.33	80008	46.73	77959	49.08	75774	51.13	73682	53.38	71784	56.05	70184	59.31		
	50---547VA---STAIQ5	25	870	60230	17.54	57467	19.30	54528	20.85	51992	22.87	49801	25.36	45880	26.78	42138	28.04		
60	50---607VA---STAIK4	125	1190	113167	76.21	110920	79.52	108677	82.83	106310	85.80	103904	88.66	101607	91.82	99485	95.44		
	50---607VA---STAIT5	50	870	82735	29.78	79665	32.20	76413	34.35	73317	36.72	70774	39.85	68212	43.21	63720	45.11		

Performance certified is for installation Type D: ducted inlet/ducted outlet. Performance ratings do not include the effects of appurtenances (accessories). See page 3 for the complete Hartzell Model Code Explanation and example.

Rating Table – Series 50 – Special Duty Direct Drive Vaneaxial, (Mine Duty), Wheel Type VA

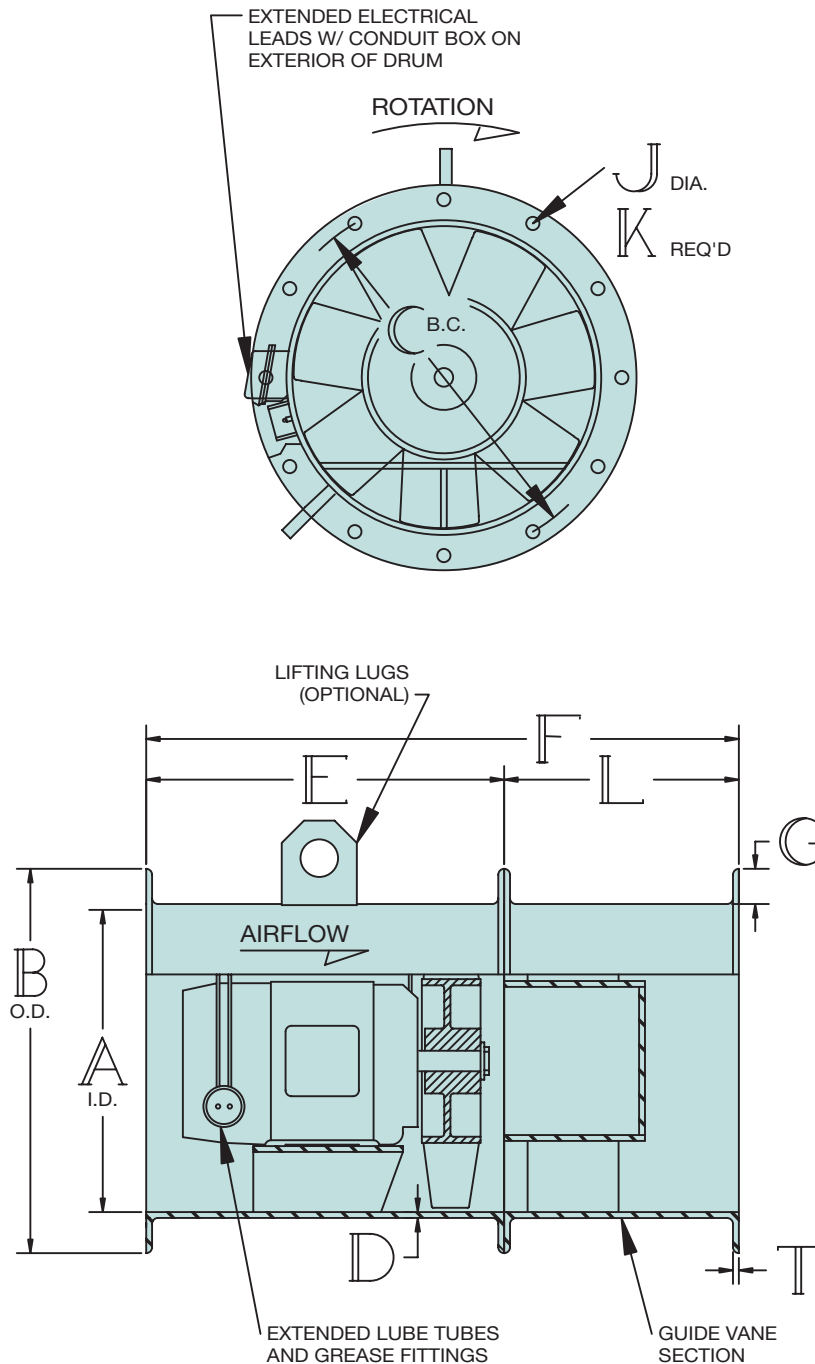
Size	Model	Motor (Fan)		CFM @ Static Pressure															
				3½"		4"		4½"		5"									
				HP	RPM	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP						
12	50---127VA---STAIH2	1	3450																
18	50---187VA---STAIM2	7½	3500	6332	6.30	6031	6.44	5660	6.52										
21	50-M-217VA---STAI02	15	3500	10858	12.81	10575	13.20	10277	13.57	9952	13.84								
26	50---267VA---STAIL3	5	1750																
29	50---297VA---STAIN3	10	1760	13194	10.26	11678	10.37												
36	50---367VA---STAIR3	30	1780	30511	27.93	29492	29.13	28098	29.86	26955	30.72								
	50---367VA---STAIM4	7½	1180																
42	50---427VA---STAIU3	60	1780	50600	54.47	49773	56.78	49002	59.27	48115	61.61								
	50---427VA---STAIU4	20	1175	25769	19.86														
48	50---487VA---STAIW3	100	1780	77744	99.79	76585	102.46	75497	105.40	74501	108.68								
	50---487VA---STAIS4	40	1180	44225	36.62	41921	37.95	39213	38.94	34722	38.83								
54	50---547VA---STAIZ3	200	1785	113864	175.38	112454	178.66	111092	182.17	109786	185.97								
	50---547VA---STAIW4	75	1185	68654	62.80	66341	65.49	63203	67.13	60627	69.06								
	50---547VA---STAIQ5	25	870																
60	50---607VA---STAIK4	125	1190	97582	99.63	95957	104.49	94159	109.19	91413	112.66								
	50---607VA---STAIT5	50	870	59769	46.99	54691	48.14												

Performance certified is for installation Type D: ducted inlet/ducted outlet. Performance ratings do not include the effects of appurtenances (accessories). See page 3 for the complete Hartzell Model Code Explanation and example.



Principal Dimensions – Series 50

Fan Size	A	B	C	D	E	F	G	J	K	L	T	MAX MOTOR FRAME
12	12	15 $\frac{5}{16}$	14 $\frac{3}{8}$	$\frac{1}{4}$	20	34	1 $\frac{1}{2}$	$\frac{3}{16}$	12	14	$\frac{1}{4}$	56
18	18	21 $\frac{5}{16}$	20 $\frac{1}{4}$	$\frac{1}{4}$	20	34	1 $\frac{1}{2}$	$\frac{3}{16}$	12	14	$\frac{1}{4}$	215T
21	21	24 $\frac{5}{16}$	23 $\frac{1}{4}$	$\frac{1}{4}$	26	43	1 $\frac{1}{2}$	$\frac{3}{16}$	12	17	$\frac{1}{4}$	256T
26	26	30 $\frac{5}{16}$	28 $\frac{1}{4}$	$\frac{1}{4}$	30	51	2	$\frac{3}{16}$	12	21	$\frac{1}{4}$	184T
29	29	33 $\frac{5}{16}$	31 $\frac{1}{4}$	$\frac{1}{4}$	31	54	2	$\frac{3}{16}$	12	23	$\frac{1}{4}$	215T
36	36	40 $\frac{5}{16}$	38 $\frac{1}{4}$	$\frac{1}{4}$	36	65	2	$\frac{3}{16}$	16	29	$\frac{1}{4}$	286T
42	42	46 $\frac{5}{16}$	44 $\frac{1}{4}$	$\frac{1}{4}$	36	69	2	$\frac{3}{16}$	16	33	$\frac{1}{4}$	364T
48	48	53 $\frac{5}{16}$	51 $\frac{1}{4}$	$\frac{1}{4}$	39	79	2 $\frac{1}{2}$	$\frac{3}{16}$	16	40	$\frac{1}{4}$	405T
54	54	59 $\frac{5}{16}$	57 $\frac{1}{4}$	$\frac{3}{8}$	45	85	2 $\frac{1}{2}$	$\frac{3}{16}$	16	40	$\frac{3}{8}$	445T
60	60	65 $\frac{5}{16}$	63 $\frac{1}{4}$	$\frac{3}{8}$	45	90	2 $\frac{1}{2}$	$\frac{3}{16}$	16	45	$\frac{3}{8}$	445T



Mine Vaneaxial Blowers (Type VB)



Series 56

Series 56 VB Mine Duty Vaneaxial Blowers

Hartzell direct drive mine duty VB vaneaxial blowers are available in sizes 14" to 48" with air deliveries from 2580 to 57,200 CFM. They are designed to be used from 4" to 14" static pressure. VB blowers were developed to meet the demand for equipment handling low volume, high-pressure requirements. In external appearance and in all details of construction, the VB blowers are identical to the VA line. Only the wheel and guide vanes are different. All units are furnished with a totally enclosed air over motor as standard. (See page 4 for standard construction features.)



The VB wheel was developed to meet the demand for low volume, high-pressure requirements. A low pitch and a higher hub to diameter ratio make this impeller more effective than the VA models at high pressures while moving a relatively smaller volume of air.

All of these wheels are cast aluminum, machined and hand ground. They are dynamically balanced to ensure vibration-free operation at high tip speeds.

Rating Table – Series 56 – Special Duty Direct Drive Vaneaxial, (Mine Duty), Wheel Type VB

Size	Model	Motor (Fan)		CFM @ Static Pressure													
				0"		1"		2"		3"		4"		6"		8"	
		HP	RPM	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
14	56---147VB---STAI12	1½	3450	3396	1.27	3001	1.46	2572	1.65	976	1.28	437	1.52				
18	56---187VB---STAI2	5	3500	5203	1.73	4903	2.12	4589	2.55	4223	2.98	3629	3.26	1767	3.66	652	4.32
21	56---217VB---STAI2	7½	8066	4.10	7770	4.88	7427	5.68	7108	6.42	6718	7.12	5492	8.04			
24	56---247VB---STAI2	20	3525	14951	12.59	14425	13.32	13938	14.23	13480	15.29	12991	16.36	11861	18.47	10393	20.17
26	56---267VB---STAI2	30	3550	19179	19.25	18609	20.16	18072	21.27	17575	22.58	17079	23.96	15942	26.68	14625	29.35
29	56---297VB---STAI2	40	3540	23225	24.65	22760	26.38	22301	28.23	21855	30.25	21417	32.40	20451	36.36	19240	39.36
29	56---297BV---STAI2	50	3540	28171	37.85	27646	39.82	27144	41.80	26670	43.80	26220	45.83	25248	49.60	24026	52.72
33	56---337VB---STAI2	60	3560	30240	33.58	29791	36.53	29322	39.49	28831	42.44	28308	45.48	27176	51.43	26031	56.14
36	56---367VB---STAI2	100	3560	39316	52.00	38827	55.85	38321	59.69	37795	63.53	37248	67.38	36055	75.31	34784	82.66
48	56---487VB---STAI3	75	1780	56812	48.79	55216	52.47	53580	56.44	51904	60.73	50148	64.91	46062	72.47	39175	77.61

Performance certified is for installation Type D: ducted inlet/ducted outlet. Performance ratings do not include the effects of appurtenances (accessories). See page 3 for the complete Hartzell Model Code Explanation and example.

Rating Table – Series 56 – Special Duty Direct Drive Vaneaxial, (Mine Duty), Wheel Type VB

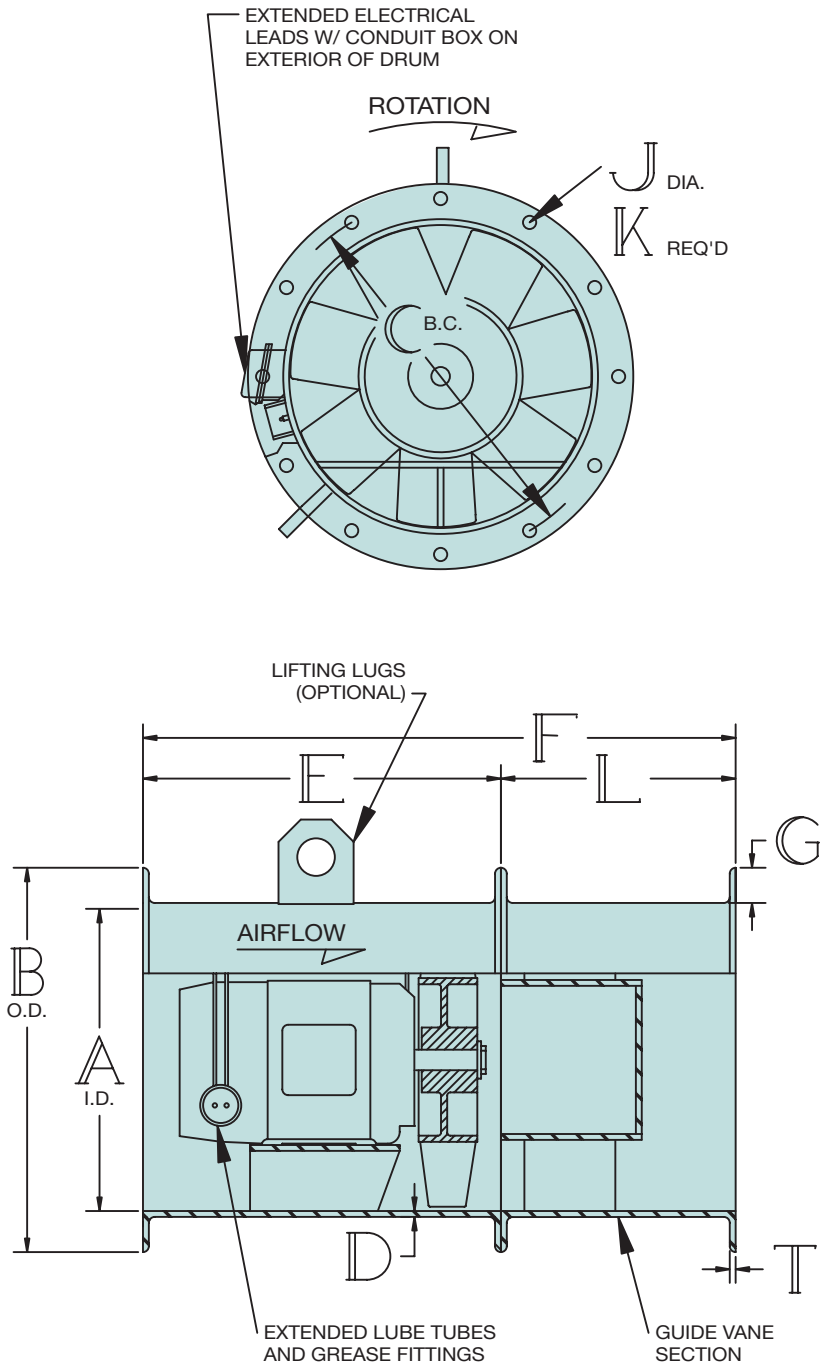
Size	Model	Motor (Fan)		CFM @ Static Pressure					
				10"		12"		14"	
		HP	RPM	CFM	BHP	CFM	BHP	CFM	BHP
14	56---147VB---STAI12	1½	3450						
18	56---187VB---STAI2	5	3500						
21	56---217VB---STAI2	7½	8066						
24	56---247VB---STAI2	20	3525						
26	56---267VB---STAI2	30	3550	12850	31.14				
29	56---297VB---STAI2	40	3540	17839	42.32	13075	41.04	9978	41.39
29	56---297BV---STAI2	50	3540	22660	56.63				
33	56---337VB---STAI2	60	3560	24824	59.88	23144	64.20	20575	68.26
36	56---367VB---STAI2	100	3560	35547	88.16	32210	92.95	30407	98.58
48	56---487VB---STAI3	75	1780	24323	74.05	18692	77.41	13353	80.42

Performance certified is for installation Type D: ducted inlet/ducted outlet. Performance ratings do not include the effects of appurtenances (accessories). See page 3 for the complete Hartzell Model Code Explanation and example.

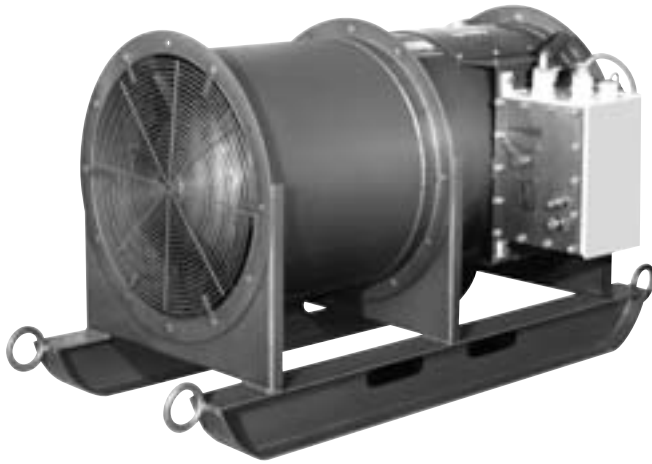


Principal Dimensions – Series 56

Fan Size	A	B	C	D	E	F	G	J	K	L	T	MAX MOTOR FRAME
14	14	17 5/16	16	3/4	20	34	1 1/2	5/16	12	14	3/4	145T
18	18	21 5/16	20 3/4	3/4	20	34	1 1/2	5/16	12	14	3/4	184T
21	21	24 5/16	23 1/4	3/4	26	43	1 1/2 x 1 1/2	5/16	12	17	3/8	215T
24	24	28 5/16	26 3/4	3/4	28	51	2 x 2	5/16	12	23	3/8	256T
26	26	30 5/16	28 3/4	3/4	30	51	2 x 2	5/16	12	21	3/8	286T
29	29	33 5/16	31 3/4	3/4	31	54	2 x 2	5/16	12	23	3/8	326T
33	33	37 1/16	35 3/4	3/8	35	61	2 x 2	5/16	16	26	1/2	365T
36	36	40 1/16	38 3/4	3/8	36	65	2 x 2	5/16	16	29	1/2	405T
48	48	53 1/16	51 1/4	3/8	39	79	2 1/2 x 2 1/2	5/16	16	40	1/2	365T

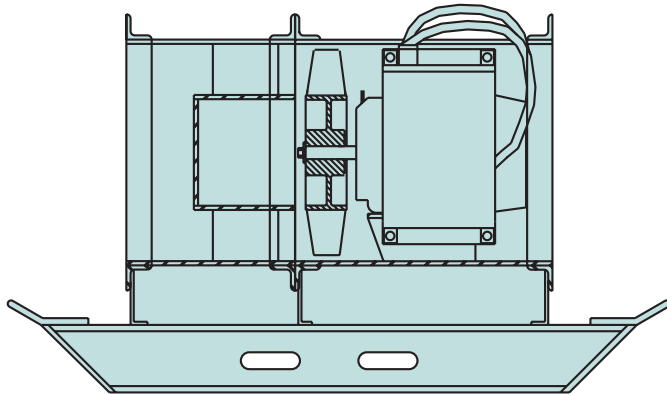


Mine Booster Fan



Series 51

The Hartzell Series 51 direct drive mine booster fan comes complete and ready for immediate operation in the mine.



Features

- Available in sizes 18"-33", 3600 RPM motors are 5 HP through 60HP respectively.
- Housings are heavy gauge steel, painted safety yellow. Nine straightening vanes are positioned in the duct to maximize fan efficiency.
- Blades are fixed pitch, airfoil type of cast aluminum, designed to function properly in a broad range of pressures.
- Explosion proof switchgear combines disconnect switch and starter with mechanical circuit breakers and thermal overload protection.
- Motors are TEFC, explosion proof, MSHA approved. (460 or 575 V).
- Electrical connections are wired. 10' of trailing cable is standard.
- Guards, access door, extended lubrication tubes and hose clamps are standard.
- Standard fan is mounted on "H" beam skid. Fork slots and towing rings are standard construction.
- Fan performance is indicated in the table below.
- Switch gear may be top or side mounted.

Accessories

The following accessory items are available for the Hartzell Mine Booster Fan:

- Inlet bell – spun orifice to reduce inlet loss.
- Companion flanges – to match fan to duct.
- Inlet and outlet cones – use to adapt fan to large diameter duct. The result is a static pressure regain.
- Sound mufflers – sound attenuating tube which can be applied to either end of the fan. In the 1500-3000 FPM velocity range, some value reduction is approximately 35%.
- Additional trailing cable – No. 8, 4-conductor, flame resistant. 500 ft. maximum length.
- Wheeled cart for easy portability.

Rating Table – Series 51 – Mine Booster Fan

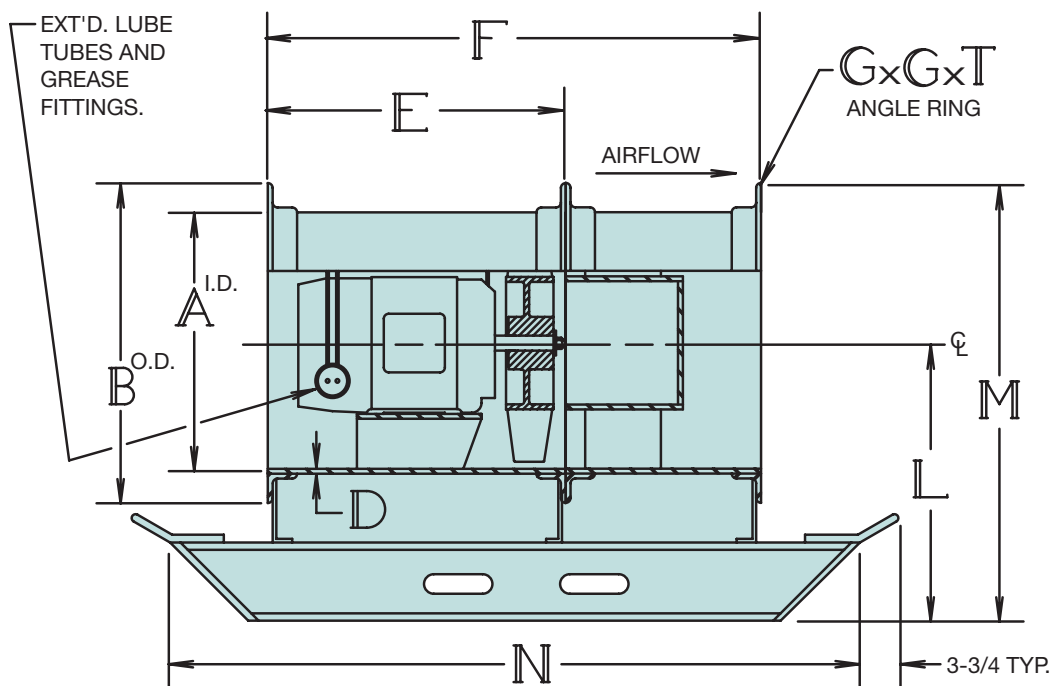
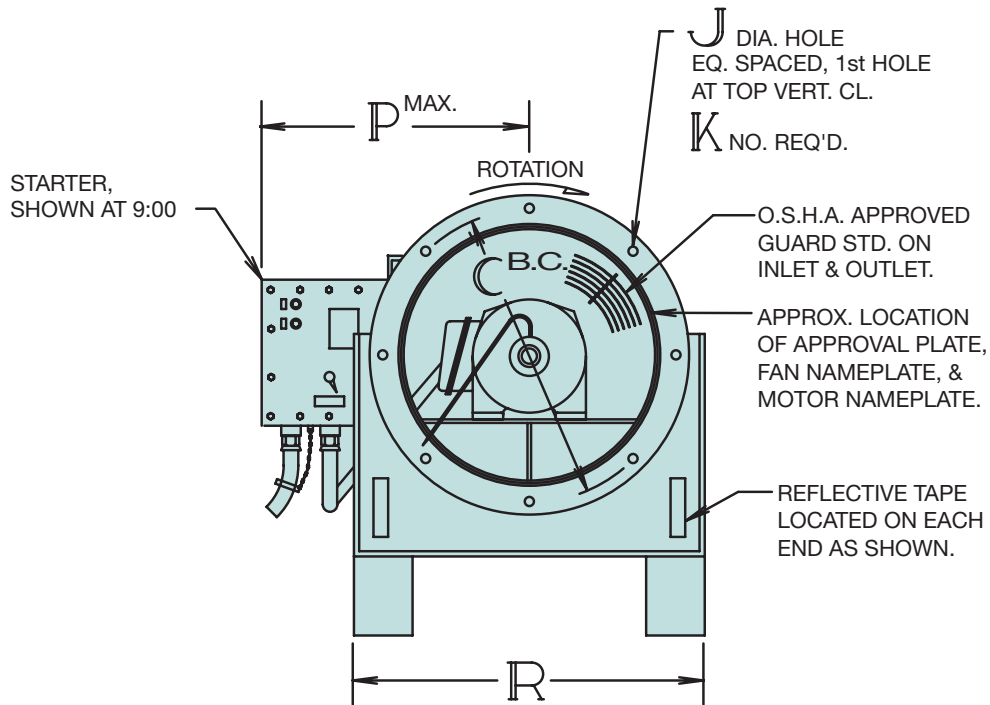
Size	Model	Motor (Fan)		CFM @ Static Pressure													
				0"		1"		2"		3"		4"		6"		8"	
		HP	RPM	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
18	51---187VB---STFQL2	5	3500	5352	1.94	5007	2.45	4658	2.94	4271	3.32	3763	3.56	2063	3.85	1182	4.22
21	51---217VB---STFQM2	7½	3500	8118	4.93	7787	5.62	7464	6.32	7133	7.01	6759	7.68	5187	8.44		
24	51---247VB---STFQP2	20	3525	14951	12.59	14425	13.32	13938	14.23	13480	15.29	12991	16.36	11861	18.47	10393	20.17
26	51---267VB---STFQR2	30	3550	19179	19.25	18609	20.16	18072	21.27	17575	22.58	17079	23.96	15942	26.68	14625	29.35
29	51---297VB---STFQS2	40	3540	23225	24.65	22760	26.38	22301	28.23	21855	30.25	21417	32.40	20451	36.36	19240	39.36
29	51---297VB---STFQT2	50	3540	28171	37.85	27646	39.82	27144	41.80	26670	43.80	26220	45.83	25248	49.60	24026	52.72
33	51---337BV---STFQU2	60	3560	30240	33.58	29791	36.53	29322	39.49	28831	42.44	28308	45.48	27176	51.43	26031	56.14

Performance certified is for installation Type D: ducted inlet/ducted outlet. Performance ratings do not include the effects of appurtenances (accessories). See page 3 for the complete Hartzell Model Code Explanation and example.

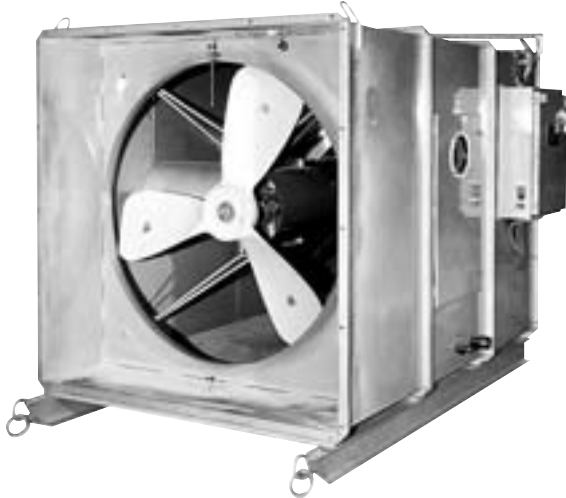


Principal Dimensions – Series 51

Fan Size	A	B	C	D	E	F	G	J	K	L	M	N	P	R	T	MAX MOTOR FRAME
18	18	21½	20¾	¼	20	34	1½	⅞	12	18½	29¾	46	28½	21½	¼	184T
21	21	24¾	23¾	¼	26	43	1½	⅞	12	20	32¾	55	30	24¾	¼	213T
24	24	28¾	26¾	¼	28	51	2	⅞	12	22	36¾	63	31½	28¾	¼	256T
26	26	30¾	28¾	¼	30	51	2	⅞	12	22¾	38	63	32¾	30¾	¼	286T
29	29	33¾	31¾	¼	31	54	2	⅞	12	24¾	41	66	34	33¾	¼	326T
33	33	37¾	36	¾	35	64¾	2	⅞	16	26¾	45¾	77¾	35¾	37¾	¼	364T



Shaft Heater



Series 811

Hartzell gas fired shaft heaters provide maximum economy in operation. Units are direct-fired, designed to burn either natural or propane gas. Capacities range from 7,000 to 100,000 CFM and from 700,000 to 10,000,000 BTU per hour at 92°F temperature rise. Higher rises are available.

Propellers are cast aluminum, single piece, airfoil type, 3-, 6-, and 8-bladed on units through 50,000 CFM. 60,000 through 100,000 CFM units utilize 4- and 6-bladed adjustable pitch assemblies.

The unit is a packaged design with controls mounted and wired, factory tested, skid mounted, ready for simple installation in the field.

Features

All Hartzell Direct Gas Fired Shaft Heaters are provided with a control system as standard. This system includes the master control panel mounted in a NEMA 12 enclosure. It consists of the motor starter, disconnect switch, control transformer, terminal strips, gas pressure switches, airflow switch, flame management system, burner modulation control and temperature controls. Standard control package includes state-of-the-art, commercially available components such as Maxitrol air temperature control system and Honeywell Series 7800 flame safeguard system. Specific models may change depending on optional controls specified.

- 7,000 to 100,000 CFM...works up to 1/2" external static pressure.
- 12-gauge steel housing reinforced with self-forming ribs for rigidity and flanges. Welded construction.
- Burner is designed for natural gas or propane.
- Belt drive arrangement, motor out of the airstream, is standard on units through 50,000 CFM. Drive bearings have extended grease tubes for servicing. 60,000 to 100,000 CFM units are belted, motor in airstream. Belts are oil, heat and static resistant.
- Motors are open end protected on belt driven units. On belted units, motors are totally enclosed, air over. Special motors are available upon request.
- Special skids can be furnished, if required.
- Special control packages are available.

Primary function is two-fold:

- a. To temper incoming down-cast ventilating air for comfort purposes; and/or
- b. To raise the temperature of same above the freezing point of water; here the purpose is to avoid freezing of ground water seepage which otherwise would freeze and tend to partially block the shaft opening, reducing airflow.

Advantages of Hartzell shaft heaters are:

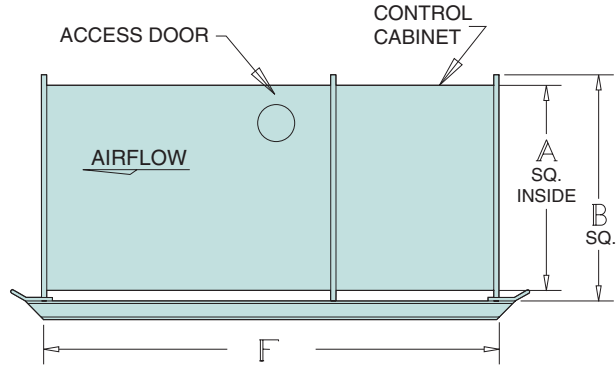
- a. Mine personnel can work in comfortable temperatures.
- b. Volume of ventilation is maintained at desired levels.
- c. Because of direct firing, 100% of the BTU content of the fuel is utilized.

**REFER TO HARTZELL BULLETIN A-125
FOR COMPLETE INFORMATION ON
GAS FIRED HEATING EQUIPMENT.**



Principal Dimensions

Model	A	B	F
G7	33½	37½	96
G10	36½	40½	96
G15	42½	46½	96
G20	50½	54½	102
G25	54½	58½	102
G30	54½	58½	102
G40	60½	64½	105
G50	70½	74½	105
G60	84	88	144
G75	84	88	144
G90	96	100	144
G100	96	100	144



Dimensions and specifications are subject to change.
Certified prints are available.

Model	CFM*	Est. S.P.**	BTU/Hr. 92°F Temp. Rise	Fan Size	Fan RPM	BHP	No. of Blades	Fan Type
G71	7,000	0	700,000	28"	1568	2.1	8	C
G72	7,000	1/4	700,000	28"	1746	2.8	8	C
G101	10,000	0	1,000,000	32"	1488	2.9	3	L
G102	10,000	1/4	1,000,000	32"	1666	4.0	6	N
G151	15,000	0	1,500,000	36"	1344	4.4	3	L
G152	15,000	1/4	1,500,000	36"	1457	5.8	3	L
G201	20,000	0	2,000,000	44"	1019	5.2	3	L
G202	20,000	1/4	2,000,000	44"	1119	6.8	3	L
G251	25,000	0	2,500,000	48"	998	7.4	3	L
G252	25,000	1/4	2,500,000	48"	1100	9.8	3	L
G301	30,000	0	3,000,000	48"	1079	9.2	3	L
G302	30,000	1/4	3,000,000	48"	1157	11.5	3	L
G401	40,000	0	4,000,000	54"	964	14.3	3	L
G402	40,000	1/4	4,000,000	54"	1042	18.3	3	L
G501	50,000	0	5,000,000	60"	880	16.6	3	L
G502	50,000	1/4	5,000,000	60"	937	20.1	3	L
G601	60,000	0	6,000,000	72"	790	19.9	6	A
G602	60,000	1/4	6,000,000	72"	871	26.1	6	A
G751	75,000	0	7,500,000	72"	830	25.1	6	A
G752	75,000	1/4	7,500,000	72"	916	32.0	6	A
G901	90,000	0	9,000,000	85"	570	26.5	6	A
G902	90,000	1/4	9,000,000	85"	631	34.0	6	A
G1001	100,000	0	10,000,000	85"	591	30.6	6	A
G1002	100,000	1/4	10,000,000	85"	644	38.0	6	A

* CFM shown is net flow at discharge and includes static pressure loss for burner, and shutter.

**Static pressure for calculated resistances external to the unit assembly.



Accessories

Guard

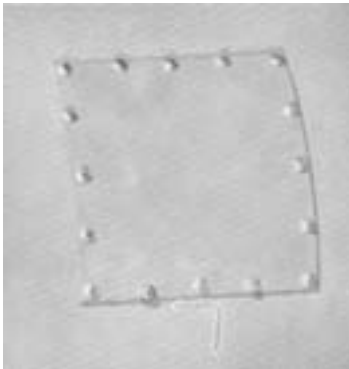
Heavy-duty spiral ring guard offers protection on intake or discharge side. OSHA approved.



CAUTION: The drive assembly of the periphery of the blades of a fan less than seven (7) feet above the floor of working level must be guarded to be in accordance with OSHA regulations.

Access Door

For maintenance of the internal parts of axial flow blowers. Door is bolted to blower housing. Gasket is provided for a proper seal.



Companion Flanges

Drilled to fit the flanges of the mine blower; allows easy installation.



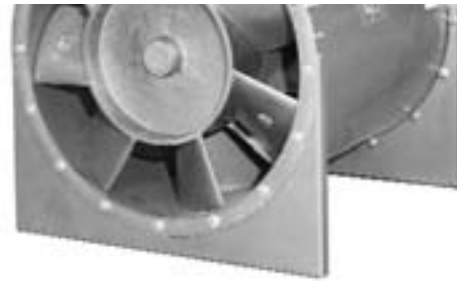
Overhead Suspension

Side mounting brackets can be used with vibration isolators. Also available for vertical mounting.



Mounting Feet

Bolted to the inlet and discharge flanges, mounting feet allow positioning of the blower on the floor, ceiling, wall or platform. Can be used with vibration isolators. Units are also available skid mounted.



Other Axial Flow Fans

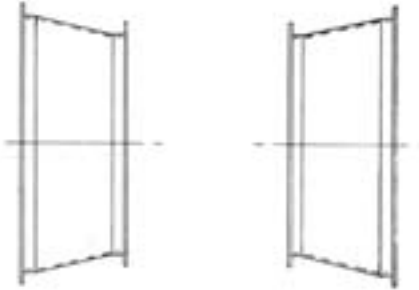
Additional duct and vaneaxial fans are available constructed of heavy gauge steel with cast aluminum airfoil type blades. Sizes range from 12" to 79" diameter. Performance from 470 CFM to 202,500 CFM at 2" static pressure; horsepower from 3/4 to 200. The fans, such as the adjustable pitch vaneaxial pictured, are available with a full line of accessories, including special coatings, to satisfy a broad range of applications.

Many of these fans are licensed to bear the AMCA Certified Ratings Seal.



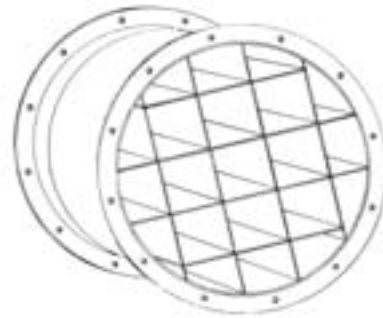
Inlet and Outlet Cones (Evasé)

Available for adapting to larger diameters, resulting in a static pressure regain.



Air Straightener

The strengthening vanes transform the kinetic energy produced by the impeller in the form of whirl into more useful pressure energy.



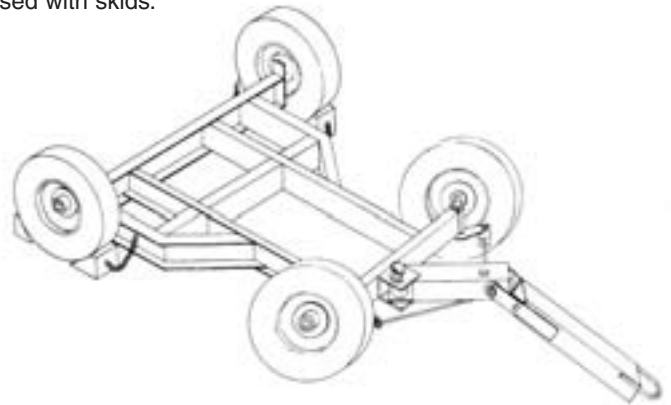
Flexible Connector

The flexible connector isolates the fan from the duct system so that vibration will not be transmitted or amplified.



Wheeled Cart

Provides flexibility in handling ventilation equipment. Must be used with skids.



SAFETY ACCESSORIES, APPLICATION AND USE WARNING

The safe application and use of equipment supplied by Hartzell Fan, Inc. is the responsibility of the installer, the user, the owner, and the employer. Since the application and use of its equipment can vary greatly, Hartzell Fan, Inc. offers various product types, optional safety accessories, and sound performance data per laboratory tests. Hartzell Fan, Inc. sells its equipment with and without safety accessories, and accordingly, it can supply such safety accessories only upon receipt of an order. The need for safety accessories will frequently depend upon the type of system, fan location and operating procedures being employed. The proper protective safety accessories to meet company standards, local codes, and the requirements of the Occupational Safety and Health Act must be determined by the user since safety requirements vary depending on the location and use of the equipment. If applicable local conditions, standards, codes or OSHA rules require the addition of the safety accessories, the user should specify and obtain the required safety accessories from Hartzell Fan, Inc. and should not allow the operation of the equipment without them.

Owners, employers, users and installers should read "RECOMMENDED SAFETY PRACTICES FOR USERS AND INSTALLERS OF INDUSTRIAL AND COMMERCIAL FANS" published by the Air Movement and Control Association International, Inc., 30 West University Drive, Arlington Heights, Illinois 60004. A copy of this publication is enclosed with each fan shipped from Hartzell Fan, Inc., and is available upon request at Hartzell's office in Piqua, Ohio 45356. Please contact Hartzell Fan, Inc. or your local Hartzell representative for more information on product types, safety accessories, and sound performance estimates. Remember, the selection of safety accessories and the safe application and use of equipment supplied by Hartzell Fan, Inc. is **your** responsibility.



Coatings

Hartzell mine blowers are supplied with an industrial air-dry enamel finish coat as standard.

A polyamide epoxy coating as a chemical resistant finish is available.

Hot dip galvanizing is also available.

An inorganic zinc coating, applied to sandblasted metal is available. This coating is for applications involving severe weather and saline atmospheres.

Special color coatings are available upon request and specification as an option.

Your local Hartzell representative can assist you in selecting the proper coating.

Sound Mufflers



This sound attenuative device is a simple lined tube that can be used on either the intake or exhaust side of a Hartzell mine blower to reduce the noise. It should not be used in a wet atmosphere or with air velocities over 5,000 FPM or above 250°F in airstream. The resistance to airflow is negligible since the internal surface is fairly smooth and the internal diameter of the muffler is the same as the blower with no internal obstruction to impede airflow.

In general, the muffler should be mounted between the blower and the area of concern (the listener).

If both the intake and exhaust of the blower are critical, use a muffler on both sides of the blower.

The outstanding features of this muffler are:

- The typical attenuation for blowers with discharge velocities from 1,500 -3,000 FPM is approximately as follows for one muffler:

Band	1	2	3	4	5	6	7	8
Db Attenuation	0	1	3	10	13	12	10	8

- For one muffler the reduction in sone value is approximately 35%. With a muffler on both intake and exhaust, the sones are reduced approximately 50%.
- There is no appreciable static pressure loss when one or two mufflers are inserted into a duct system.
- The mounting flanges match the corresponding blower flanges and are drilled for easy attachment. By using flexible connections between blower and muffler, the sound attenuation is helped, particularly in the lower bands.
- The absorbent material has a black rubberized surface next to the airstream, which prevents erosion up to 5,000 FPM velocity, and is held in place with an expanded metal liner.



Specification (Typical)

The Special Duty Axial Flow Fans, Series 44, 50 or 56 will consist of a housing constructed of heavy-duty hot rolled steel. Housing will be furnished with barstock flanges (inlet and outlet) continuously welded to the drum.

Vane sections consist of a heavy gauge hot rolled steel housing. Nine steel vane sections are continuously welded to the inside of the drum and the vane section hub. Vane section housings are furnished with rolled steel flanges.

The blower housing is complete with a heavy gauge motor mounting plate punched to accept a foot mounted, TEAO motor mounted upstream from the blower wheel.

The wheels are one-piece solid cast aluminum. All wheels are statically and dynamically balanced. The blower assembly is electronically balanced as a unit prior to shipment.

The Series 51, Mine Booster Fan, is built in accordance with MSHA standards per Title 30 of the "Code of Federal Regulations".

Sound Information

The direct drive mine duty axial flow blowers have been tested for noise in Hartzell's Research and Development Center in accordance with industry's standards.

Sound power levels for each blower size and speed settings are available.

Readings have been taken at low, medium, and high static pressures and in each of the eight octave bands. This data provides a base from which any point of operation can have its sound power levels determined by straight-line interpolation.

Sound pressure ratings in dBA levels are also available. The ratings are calculated from the "A" weighting network. Room construction, blower installation, and distance from the source of noise affect dBA readings. Published data is therefore based on Hartzell laboratory tests and is not indicative of actual installation values.

The dBA weighting is a convenient, single number method for judging the loudness of sound. The dBAs, however, are not

practical when comparing two or more noise sources. First, they are relevant readings only to the environment where they are measured. Secondly, dBAs are derived from logarithms. Noise that appears twice as loud as another is not twice as many dBAs.

For a particular blower, we can change its sound pressure level in a room by various attenuation techniques, but the sound power level of the blower is constant. This is why a sound engineer generally requests sound power levels instead of sound pressure levels, which are valid only for the particular environment where measured.

For particularly troublesome applications, Hartzell furnishes duct sound attenuation devices. The device works well in the 4-8 octave bands, but provides marginal attenuation in the lower bands (see page 18).

Sound is a complicated, vexing problem. Contact Hartzell for accurately measured sound output of our blowers in both sound power and pressure levels.



Hartzell Warranty

LIMITED WARRANTIES

Hartzell represents to Buyer that any goods to be delivered hereunder will be produced in compliance with the requirements of the Fair Labor Standards Act of 1938 as amended.

Hartzell also warrants to Buyer its goods to be free from defects in workmanship and material under normal use and service for one (1) year after tender of delivery by Hartzell, plus six (6) months allowance for shipment to approved stocking dealers & distributors. No warranty extends to future performance of goods and any claims for breach of warranty or otherwise accrues upon tender of delivery. The foregoing constitute Hartzell's sole and exclusive warranties in lieu of all other warranties, whether written, oral, express, implied or statutory.

LIMITATION OF LIABILITY FOR BREACH OF WARRANTY

Hartzell's obligation for any breach of warranty is limited to repairing or replacing, at its option, without cost to Buyer at its factory any goods which shall, within such a warranty period, be returned to it with transportation charges prepaid, and which its examination shall disclose to its satisfaction to have been defective. Any request for repair or replacement should be directed to Hartzell Fan, Inc., P.O. Box 919, Piqua, Ohio 45356. Hartzell will not pay for any repairs made outside its factory without its prior written consent. This does not apply to any such Hartzell goods which have failed as a result of faulty installation or abuse, or incorrect electrical connections or alterations, made by others, or use under abnormal operating conditions or misapplication of the goods.

LIMITATION OF LIABILITY

To the extent the above limitation of liability for breach of warranty is not applicable, the liability of Hartzell on any claim of any kind, including negligence, for any loss or damage arising out of or connected with, or resulting from the sale and purchase of the goods or services covered by these Terms and Conditions of Sale or from the performance or breach of any contract pertaining to such sale or purchase or from the design manufacture, sale, delivery, resale, installation, technical direction installation, inspection repair, operation or use of any goods or services covered by these Terms and Conditions shall, in no case exceed the price allocable to the goods or services which gave rise to the claim and shall terminate one year after tender of delivery of said goods or services.

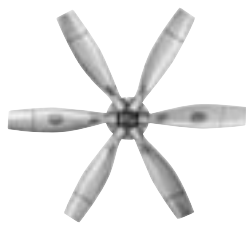
In no event whether as a result of breach of contract, or warranty or alleged negligence, defects incorrect advice or other causes, shall Hartzell be liable for special or consequential damages, including, but not limited to, loss of profits or revenue, loss of use of the equipment or any associated equipment, cost of substitute equipment, facilities or services, down time costs, or claims of customers of the Buyer for such damages. Hartzell neither assumes nor authorizes any person to assume for it any other liability in connection with the sale of its goods or services.

NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS

HARTZELL DOES NOT WARRANT THAT SAID GOODS ARE OF MERCHANTABLE QUALITY OR THAT THEY ARE FIT FOR ANY PARTICULAR PURPOSE. THERE IS NO IMPLIED WARRANTY OF MERCHANTABILITY AND THERE IS NO IMPLIED WARRANTY OF FITNESS.



Propeller Fans



Cooling Tower &
Heat Exchanger Fans



Duct Fans



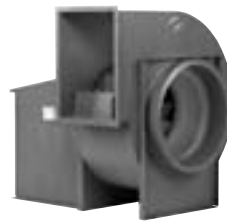
Duct Axial Fans



Vaneaxial Blowers



Cool Blast & Utility Fans



Steel Centrifugal Blowers



Roof Ventilators –
Steel & Fiberglass



Heating Equipment –
Gas & Steam



Fiberglass
Axial Flow Fans



Fiberglass Centrifugal
Blowers



Marine –
Mine Duty Blowers

Hartzell Fan, Inc., Piqua, Ohio 45356 • Plants in Piqua, Ohio and Portland, Indiana.