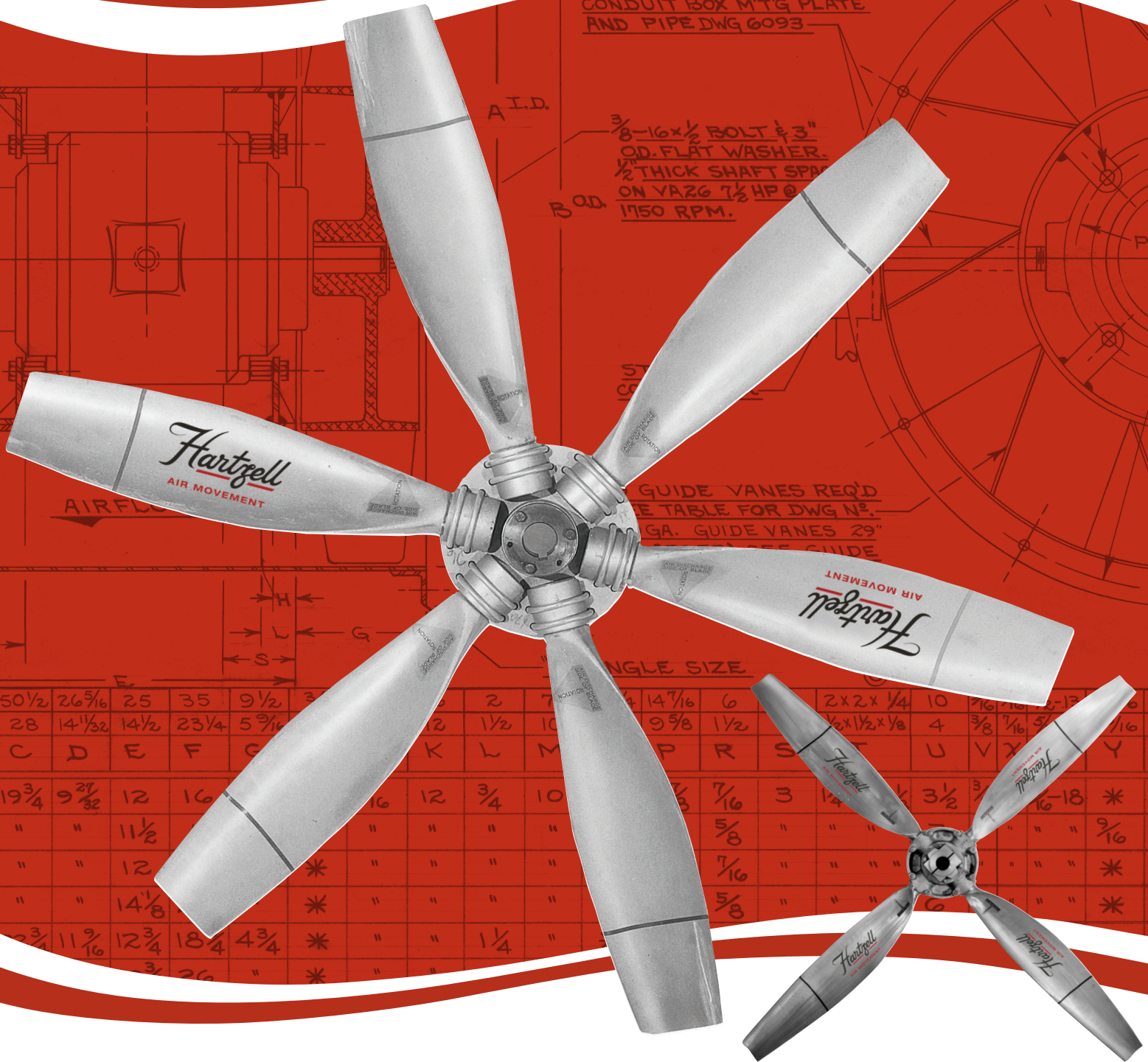


Hartzell

AIR MOVEMENT

Adjustable Pitch Fans

SERIES 89, 90, 90R, 90U, 91, 92



Hartzell Air Movement

910 S. Downing Street Piqua, OH 45356-0919

Contact

1-800-336-3267 | info@hartzell.com

Website

www.hartzellairmovement.com

THE HARTZELL DIFFERENCE

Building the highest quality fans in America for generations



QUALITY AT EVERY TURN.

Hartzell Air Movement exceeds the standard in the air movement industry, committed to delivering top-quality, reliable products. And our relationship with our customers, and our knowledgeable, inventive, flexible and hardworking employees are the reasons we've continued and thrived, right here in the USA, for six generations.

Customers choose Hartzell for our:

- Durability and high performance
- Low cost of ownership
- Leadership in performance testing and certification
- Advanced engineering and manufacturing processes
- Innovative design and manufacturing
- Trusted brand name

Experienced Hartzell team to assist you from design to shipping

ISO 9001:2015 Certification
AMCA Accredited Laboratory
Complete Fans and Blowers
Centrifugal Wheels
Airfoil Propellers



HARTZELL ADVANTAGES

A LIFETIME OF VALUE

- Industrial fans are field proven, 100% tested, with virtually no incident of return
- Energy efficient designs that provide a lower total cost of ownership

LEADERSHIP IN PERFORMANCE

- Products certified by AMCA that meet DOE recommended efficiencies
- Highly efficient industrial fan designs that are the quietest in the market
- Airfoil shape blades with industry leading measured efficiencies

ADVANCED ENGINEERING & MANUFACTURING

- Proven manufacturing techniques on state of the art equipment in ISO 9001:2015 registered facilities
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CREATIVE DESIGN & MANUFACTURING TEAM

- Offering the greatest number of industrial fan design choices
- Building products to meet your rigorous application; no limiting catalog

TRUSTED BRAND NAME

- Extensive talent pool bringing over 145 years of knowledge and experience to you

5-YEAR WARRANTY

- The industry's first and only manufacturer that stands behind their products for a full 5-years



- Register your 5 year warranty
- Download your installation manual
- Order replacement parts



For more information, contact your local Hartzell Sales Representative. info@hartzell.com

HARTZELL WARRANTY

LIMITED WARRANTIES, LIMITATION OF LIABILITY, AND LIMITATION OF LIABILITY FOR BREACH OF WARRANTY

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.

The details of the Hartzell warranty can be found at <http://www.hartzellairmovement.com/warranty-service>

PERFORMANCE GUARANTEED

Your products are only as good as the components that go into them. We know you have high expectations, and so does Hartzell Air Movement. We know you expect the most reliable and durable industrial air movement products available, so we're holding ourselves to a higher standard. We're so sure that our products will out-perform industry standards, we're backing that promise with the industry's first – and only – five-year warranty.

At Hartzell, these are words we live by. They guide us every day. Good enough isn't how you design your products. It's not how we engineer, build and support our products — or provide ongoing service to our customers. When we looked at the industry standard two-year warranty, we knew we had to do better. And we did — by offering the Hartzell **FIVE-YEAR WARRANTY.**

Register for your 5year warranty at <https://www.hartzellairmovement.com/warranty-and-parts/five-year-warranty>

Hartzell Air Movement
proudly manufactures
our fans right here in
the USA!



**MADE IN
U.S.A.**

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SAFETY ACCESSORIES, APPLICATION AND USE WARNING

The safe application and use of equipment supplied by Hartzell Air Movement 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 Air Movement offers various product types, optional safety accessories, and sound performance data per laboratory tests. Hartzell Air Movement 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 Air Movement 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 Control Association, Inc., 30 West University Drive, Arlington Heights, Illinois 60004. A copy of this publication is enclosed with each fan shipped from Hartzell Air Movement, and is available upon request at Hartzell's office in Piqua, Ohio 45356.

Please contact Hartzell Air Movement 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 Air Movement is your responsibility

SAFETY ACCESSORIES WARNING

The responsibility for providing safety accessories for equipment supplied by Hartzell Air Movement is that of the installer and user of this equipment. Hartzell Air Movement sells its equipment with and without safety accessories, and accordingly, it can supply such safety accessories upon receipt of order.

The user, in making its determination as to the appropriate safety accessories to be installed and any warning notices, should consider (1) the location of the installation, (2) the accessibility of employees and other persons to this equipment, (3) any adjacent equipment, (4) applicable building codes, and (5) requirements of the federal Occupational Safety and Health Act.

Users and installers of this equipment should read "RECOMMENDED SAFETY PRACTICES FOR USERS AND INSTALLERS OF INDUSTRIAL AND COMMERCIAL FANS" published by the Air Movement Control Association, Inc., 30 West University Drive, Arlington Heights, Illinois 60004. A copy of this publication is enclosed with each fan shipped from Hartzell Air Movement, and is available upon request at Hartzell's office in Piqua, Ohio 45356.

Performance Guaranteed



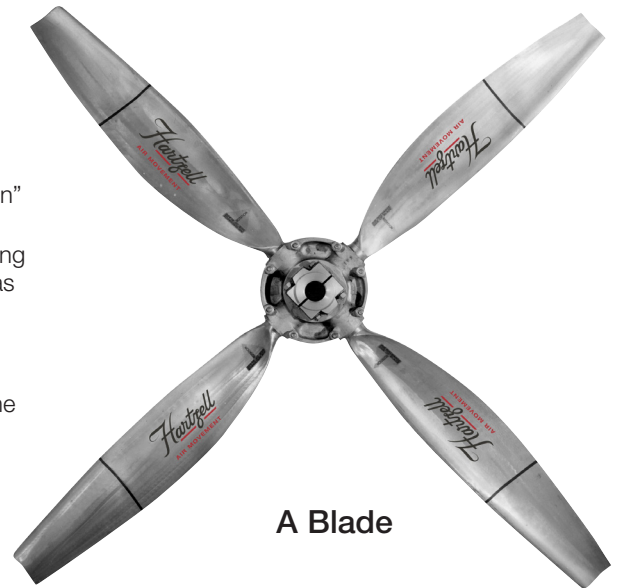
Your products are only as good as the components that go into them. We know you have high expectations, and so does Hartzell Air Movement. We know you expect the most reliable and durable industrial air movement products available, so we're holding ourselves to a higher standard. We're so sure that our products will out-perform industry standards, we're backing that promise with the industry's first – and only – five-year warranty.

At Hartzell, these are words we live by. They guide us every day. Good enough isn't how you design your products. It's not how we engineer, build and support our products — or provide ongoing service to our customers. When we looked at the industry standard two-year warranty, we knew we had to do better. And we did — by offering the Hartzell **FIVE-YEAR WARRANTY**.

Series 89 | Aluminum Adjustable Pitch Fan Assembly

Construction Features:

- **Airfoil Section** – Blades are alloy #319 aluminum, sand cast, ground to satin finish for balance.
- **Sizes:**
 - Model A** – 48" - 144" diameter, 4-blade & 6-blade.
 - Model AS** – 156" and 168" diameter, 4-blade & 6-blade.
- **Hub:**
 - Model A** – Hub is cast aluminum with self-contained blade housing threaded to accept the blades.
 - Model AS** – Hub is constructed of heavy welded steel with the "drop-in" blade assembly and bolted steel cap blade retention.
- **Split Taper Bushing** – 84" and larger are furnished with split taper bushing as standard. Sizes 48" through 72" are furnished with clamp-type bushing as standard. Clamp-type bushings available on sizes 84" - 144".
- **Manual Adjustments:**
 - Model A** – Blades have threaded shanks, which screw into threaded aluminum hub sockets. Angle change is easily effected by loosening the hub clamping bolts at each blade socket and rotating the blade
 - Model AS** – Angle change is made by loosening the steel cap just enough to rotate each blade to the required angle.
- **Balance** – Blades are statically balanced against a master. Hub is dynamically balanced.
- **Maximum Tip Speed** – 15,000 FPM.



A Blade

Performance:

- **Air Flow** – High efficiency at moderate pressure.
- **Air Volume** – Model A – 13,000 to 435,000 CFM at free air.
Model AS – Performance to 450,000 CFM.
- **Static Pressure** – Efficient operation ranges from free air through 3/4" W.G.
- **Fan Efficiency** – Hartzell Series 89 adjustable pitch fans can reach a maximum total efficiency of 75%. Average efficiency for design is 65%.
- **Testing Method** – Fans are tested for sound and air ratings in Hartzell's Research and Development Center in accordance with industry standards.

Special Design Features:

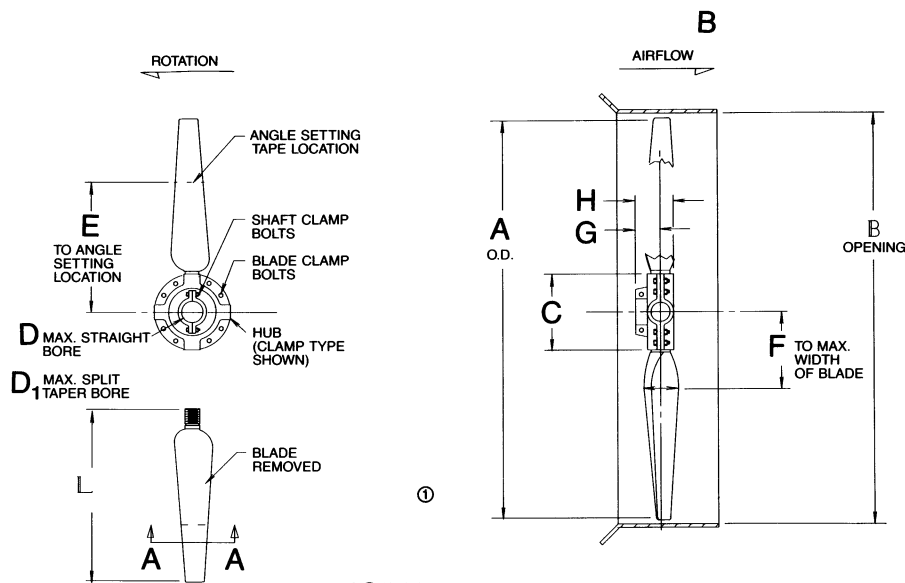
- **Stable Performance** – Wide range in flow volume from medium to high blade angle settings.
- **Standard Rotation** – All sizes are available in right-hand rotation. Left-hand rotation available in sizes 72", 84", 96", 108", 120", and 132" only.
- **Maximum Temperature:**
 - Model A** – Sizes 48" - 72" – 200°F (93°C) maximum.
Sizes 84" - 144" – 200°F (93°C) is standard. High temperature construction (300°F [149°C]) is available.
 - Model AS** – Sizes 156" and 168" – 300°F (149°C) is standard.
- **Coatings** – Special coatings for application of Hartzell blades in corrosive atmospheres are available in a wide variety which include, but are not limited to, epoxy, bitumastic and inorganic zinc.
- **Shipment** – Series 89 fans are shipped knocked down as standard. Shipment of complete assemblies up to 72" is available upon request.
- **Contact your local Hartzell representative for assistance.**
Call 1-800-336-3267.

Dimensions

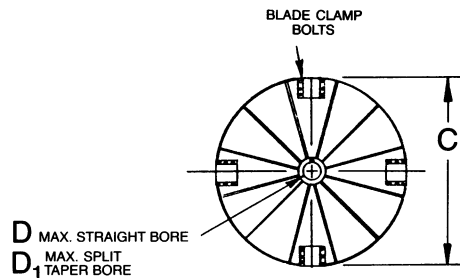
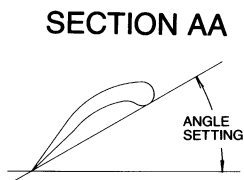
Principal Dimensions

FAN SIZE	48	54	60	72	84	96	108	120	132	144	Model AS	
											156	168
A	48	54	60	72	84	96	108	120	132	144	156	168
B	48 ^{3/4}	54 ^{3/4}	60 ^{7/8}	73	85 ^{1/4}	97 ^{3/8}	109 ^{1/2}	122	134	145	158	170
C	8	8	9 ^{1/2}	9 ^{1/2}	11 ^{3/4}	11 ^{3/4}	14	14	15	15	30 ^{3/4}	42
D	1 ^{3/4}	1 ^{3/4}	2 ^{3/4}	2 ^{3/4}	2 ^{1/2}	2 ^{1/2}	3	3	3 ^{1/2}	3 ^{1/2}	4	4
D ₁	—	—	—	—	2 ^{1/2}	2 ^{1/2}	3 ^{5/8}	3 ^{5/8}	3 ^{5/8}	3 ^{5/8}	5	5
E	16	17 ^{3/4}	20	24	28 ^{5/16}	32	36	40	44	48	50 ^{1/2}	56
F	13 ^{1/8}	14 ^{9/16}	15 ^{29/32}	19 ^{21/32}	22 ^{11/16}	24 ^{3/8}	30 ^{9/16}	31 ^{13/16}	34 ^{7/16}	37	39 ^{3/8}	44 ^{7/8}
L	22 ^{1/4}	25 ^{1/4}	27 ^{1/2}	33 ^{1/2}	39 ^{3/16}	45 ^{3/16}	50 ^{5/16}	56 ^{15/16}	62 ^{7/16}	68 ^{7/16}	67 ^{1/2}	68
Max. Width of Blade	4 ^{11/16}	5 ^{1/2}	6 ^{1/8}	7 ^{1/8}	8 ^{1/2}	9 ^{5/8}	10 ^{5/8}	12 ^{1/16}	13	14 ^{3/4}	14 ^{5/8}	14 ^{5/8}
Max. Bore	—	—	—	—	2 ^{1/2}	2 ^{1/2}	3 ^{5/8}	3 ^{5/8}	3 ^{5/8}	3 ^{5/8}	3 ^{5/8}	3 ^{5/8}
Ass'y (4) Blade	24	24	35	47	71	87	175	167	243	259	424	548
Wgt.* (6) Blade	32	32	50	68	97	121	256	244	343	367	556	672
WR ² Lb. (4) Blade	10.5	11.75	29.5	70	160	295	540	840	1400	2200	2812	3870
Ft. ² (6) Blade	15	18.25	41	100	235	420	800	1300	2000	3300	4160	5595

* Sizes 48" - 72" include clamp-type hub. Sizes 84" and larger include split taper bushing. Dimensions and specifications are subject to change. Certified prints are available.



**MODEL A
(Cast Aluminum Hub)**



**MODEL AS
(Steel Hub)**

NOTES:

1. 4-blade assembly shown. Available in 6-blade. All sizes are available in right-hand rotation. Left hand rotation available in sizes 72", 84", 96" 108", 120", 132" only.
2. Clamp type hub standard on sizes 48"-72". Available on sizes 84"-144".
3. Split taper bushing type hub standard on sizes 84" through 144".

Series 90 | Adjustable Pitch Fans

Construction Features:

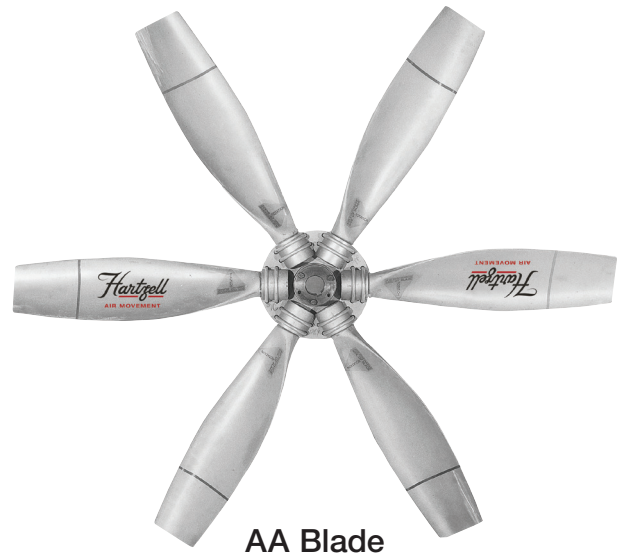
- **Airfoil Section** – True effective airfoil designed to move a high volume of air at moderate static pressure.
- **Sizes** – 48" - 144" diameter, 4-blade and 6-blade design.
- **All Aluminum Construction** – Blades are alloy #319 aluminum, sand cast, ground to satin finish for balance. Hubs are cast aluminum and ground to satin finish for balance. U-bolts are S.A.E. Grade 5 U-bolts; cadmium plated with Class 2A thread.
- **Taper Lock Bushing** – Available in a wide range of bore sizes.
- **Drop-in Blade Retention; Manual Adjustment** – Blades have a retention shoulder which fits into a recess in the hub to ensure proper location. Design does not require accessory port in the fan orifice to assemble the blades.
- **Balance** – Blades are statically balanced against a master. (Dynamic balancing of complete assemblies, through 72" is available upon request.)
- **Maximum Tip Speed** – 15,000 FPM.

Performance:

- **Air Flow** – High efficiency for maximum cooling effect.
- **Air Volume** – 10,000 to 500,000 CFM at free air.
- **Static Pressure** – Efficient operation ranges from free air through 1.0" W.G. (at 0.075 lbs./ft.³ density).
- **Efficiency** – Hartzell Series 90 adjustable pitch fans feature maximum static efficiencies of 58% and maximum total efficiencies of 73%.
- **Testing Methods** – Series 90 adjustable pitch fans are tested for sound and air performances in Hartzell's Research and Development Center in accordance with industry standards.

Special Design Features:

- **Stable Performance** – Wide range in flow volume from medium to high blade angle settings. Stable performance under varying pressure at low blade angles.
- **Standard Rotation** – Right-hand or left-hand rotation in all sizes.
- **Maximum Temperature** – 300°F (149°C).
- **Special Blade Configurations** – Cut offs are available.
- **Coatings** – Special coatings for application of Hartzell blades in corrosive atmospheres are available in a wide variety, which include, but are not limited to, epoxy, bitumastic and inorganic zinc.
- **Shipment** – Series 90 fans are shipped knocked down as standard. Shipment of complete assemblies up to 72" is available upon request.
- **Contact your local Hartzell representative for assistance.**
Call 1-800-336-3267.



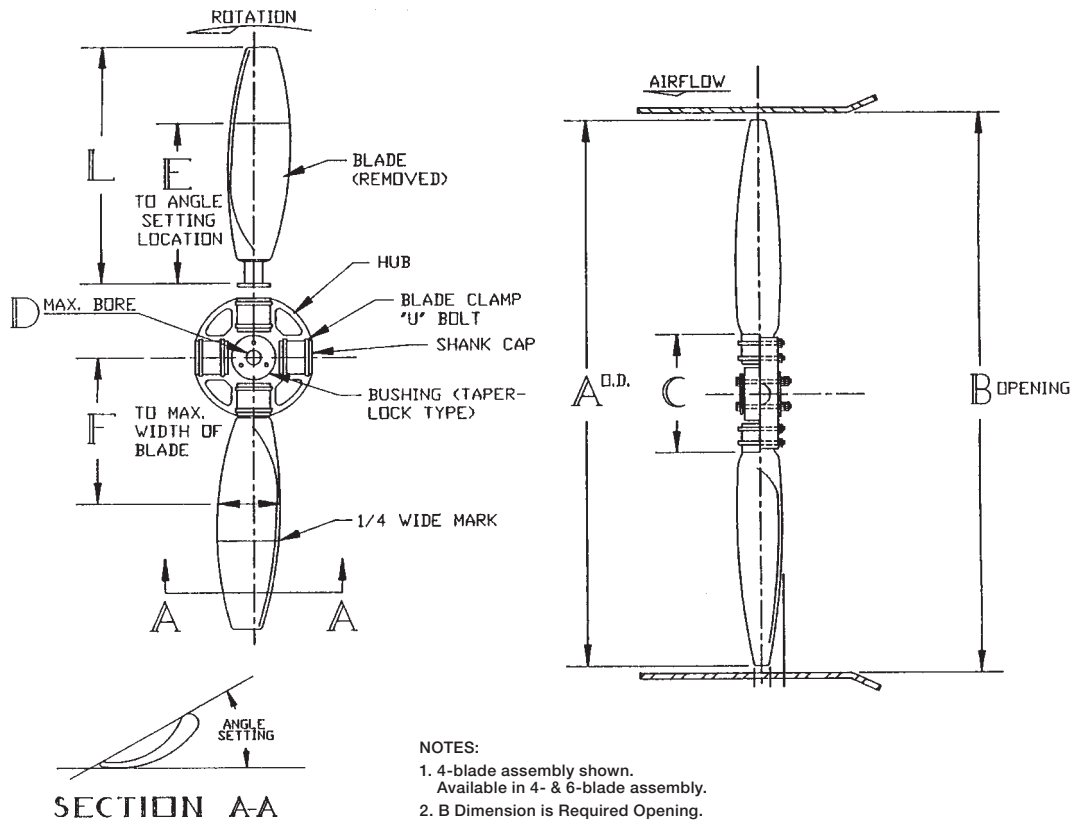
Fan Performance Curves and Complete Sound Data are Available Upon Request.

Dimensions

Principal Dimensions

FAN SIZE		48	54	60	72	84	96	108	120	132	144
A		48	54	60	72	84	96	108	120	132	144
B		49 ^{1/4}	55 ^{1/2}	61 ^{5/8}	73	85 ^{1/4}	97 ^{3/8}	109 ^{1/2}	121 ^{1/2}	133 ^{1/2}	145 ^{1/2}
C		10 ^{1/2}	10 ^{1/2}	10 ^{1/2}	10 ^{1/2}	12 ^{1/4}	12 ^{1/4}	15 ^{3/4}	15 ^{3/4}	19 ^{1/4}	19 ^{1/4}
D		2 ^{1/16}	2 ^{1/16}	2 ^{1/16}	2 ^{1/16}	2 ^{1/16}	2 ^{1/16}	2 ^{13/16}	2 ^{13/16}	2 ^{13/16}	2 ^{13/16}
E		13	21	21	21	28 ^{1/8}	28 ^{1/8}	35	35	41 ^{7/8}	41 ^{7/8}
F		14 ^{1/2}	17 ^{7/8}	17 ^{7/8}	17 ^{7/8}	23 ^{7/8}	23 ^{7/8}	30 ^{3/4}	30 ^{1/4}	31 ^{1/8}	31 ^{1/8}
Bushing		9773-1	9773-1	9773-1	9773-1	9773-1	9773-1	9773-2	9773-2	9773-2	9773-2
Max. Bore		2 ^{5/8}	2 ^{5/8}	2 ^{5/8}	2 ^{5/8}	2 ^{5/8}	2 ^{5/8}	3 ^{5/8}	3 ^{5/8}	3 ^{5/8}	3 ^{5/8}
Ass'y	(4) Blade	41.5	43	47	57.5	94.5	103	195	218	308	320
Wgt.	(6) Blade	54.5	59	65	78.5	132	142.5	268	297	425	443
WR ² Lb.	(4) Blade	20	33	44	64.3	191	241	633.4	701	1434.2	1648.7
Ft. ²	(6) Blade	30	49.5	66	96.5	286.5	361.5	946.1	964.5	2141.7	2462.9

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



Series 90R/90U | Aluminum Adjustable Pitch Reversible Fan Assembly

Construction Features:

- **Airfoil Section** – Blade design is a field-proven Hartzell airfoil, modified such that the leading edges and the trailing edges of the blades are identical in either direction of rotation. The result is 100% airflow in reverse rotation.
- **Sizes** – 48" - 84" diameter, 4-blade and 6-blade design.
- **All Aluminum Construction** – Blades are alloy #319 aluminum, sand cast, ground to satin finish for balance; or permanent mold, depending on size. Hubs are permanent mold castings ground to satin finish for balance. U-bolts are S.A.E. Grade 5 U-bolts; cadmium plated with Class 2A thread. NOTE: When assembly is used for hardwood kiln applications, 304 Stainless hardware must be used (U-bolts, nuts, washers, and backing plate.)
- **Taper Lock Bushing** – Available in a wide range of bore sizes.
- **Drop-in Blade Retention; Manual Adjustment** – Blades have a retention shoulder which fits into a recess in the hub to ensure proper location. Design does not require accessory port in the fan orifice to assemble the blades.
- **Balance** – Blades and hubs are statically balanced against a master. (Dynamic balancing of complete assemblies, with match-mark indexing is optional.)
- **Maximum Tip Speed** – 17,000 FPM.

Performance:

- **Air Flow** – 100%, either direction.
- **Air Volume** – 12,000 to 150,000 CFM at free air.
- **Static Pressure** – Efficient operation ranges from free air through 2" W.G. (at 0.075-lbs./ft.3 density).
- **Efficiency** – Hartzell Series 90R adjustable pitch reversible features maximum static efficiencies of 58% and maximum total efficiencies of 73%.
- **Testing Methods** – Series 90R adjustable pitch reversible fans have been tested for sound and air performances in Hartzell's AMCA accredited laboratory. Product performance data based on tests in an AMCA accredited laboratory are not to be construed as being licensed to bear the AMCA Seal.

Design Features:

- **Stable Performance** – Under varying pressures without stall is characterized by the typical performance curve illustrated on this page.
- **Standard Rotation** – is right-hand. The 72" and 84" sizes are available in left-hand rotation.
- **Maximum Temperature** – 300°F (149°C).
- **Coatings** – Special coatings for application of Hartzell blades in corrosive atmospheres are available.
- **Shipment** – Series 90R fans are shipped knocked down as standard. Shipment of complete assembly is available upon request.



AAR Blade

Ultra High Temperature Construction (Optional):

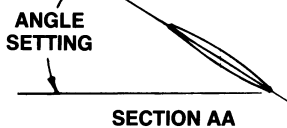
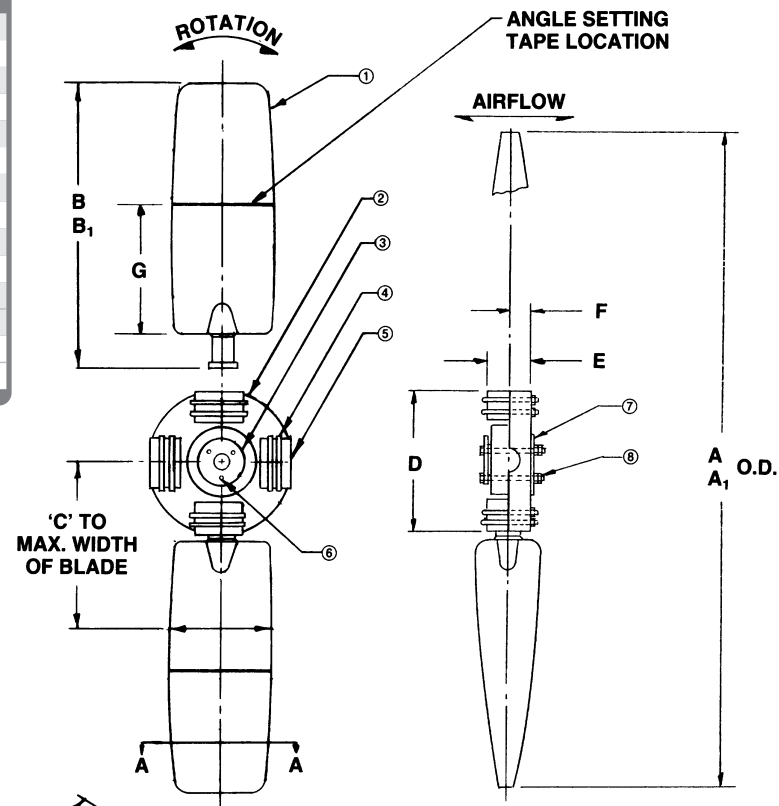
- **Maximum Temperature** – 400°F (204°C).
- **Performance** – Same stable, efficient airfoil design and shape utilized in standard construction. (See previous section).
- **Airfoil Construction** – 100% reversible airfoil cast in A240.1 aluminum alloy. Static balanced against a master is standard. Dynamic balancing is optional.
- **Hub Construction** – Hub is fabricated, painted, high strength steel. Same drop-in blade retention as standard design.
- **Taper Lock Bushing** – For easy installation and removal. Carbon steel standard; stainless steel optional.
- **Maximum Tip Speed** – 18,500 FPM.
- **Sizes** – 60" & 72", 4-blade and 6-blade available.

Fan Performance Curves and Complete Sound Data are Available Upon Request.

Dimensions

Principal Dimensions

FAN SIZE		48	54	60	72	84
A		48 ^{1/2}	54 ^{3/4}	60 ^{3/4}	72	84
A ₁		47 ^{3/4}	53 ^{5/8}	59 ^{3/8}	71	83
B		21 ^{5/8}	24	26	31 ^{5/8}	37 ^{5/8}
B ₁		21 ^{1/4}	23 ^{7/16}	25 ^{5/16}	31 ^{1/8}	37 ^{1/8}
C		12 ^{1/8}	13 ^{11/16}	15 ^{3/16}	12 ^{3/4}	12 ^{3/4}
D		10 ^{1/2}	12 ^{1/4}	15 ^{3/4}	15 ^{3/4}	15 ^{3/4}
E		3 ^{1/8}	3 ^{5/8}	4 ^{1/4}	4 ^{1/4}	4 ^{1/2}
F		1 ^{9/16}	1 ^{13/16}	2 ^{9/32}	2 ^{9/32}	2 ^{9/32}
G		10 ^{7/16}	11 ^{1/2}	11 ^{11/16}	15 ^{9/16}	15 ^{9/16}
Max. Bore		2 ^{5/8}	2 ^{5/8}	3 ^{5/8}	3 ^{5/8}	3 ^{5/8}
Ass'y	(4) Blade	48	69	114	146	161
Wgt.	(6) Blade	67	94	146	194	217
WR ² Lb.	(4) Blade	31.3	54.6	119.5	211.0	294
Ft. ²	(6) Blade	46.5	80.3	219.4	310.6	435.7



- ① Blade
- ② Hub
- ③ Bushing
- ④ Blade Clamp "U" Bolt
- ⑤ Shank Cap
- ⑥ (3) SAE Grade 5 Bolts Hardened w/Class 2A Thread
- ⑦ Backing Plate
- ⑧ Heavy Hex Nut w/Class 2A Thread (2 on Each Bolt)

- NOTES:
1. 4-blade assembly shown. Available in 6-blade.
 2. Use 'A' & 'B' for Duct Fan Type Application.
 3. Use 'A' & 'B' for Double Orifice Type Application (Ring Fan).
 4. Bushing Bolts go through Hub and Backing Plate and are double-nutted on back side.
 5. Standard cast aluminum hub shown. Fabricated steel hubs provided on series 90U, 60" and 72". Hub diameter is "D" plus 1/2. Does not affect "A" or "A₁" dimension.

Series 91 | Aluminum Adjustable Pitch Fan Assembly

Construction Features:

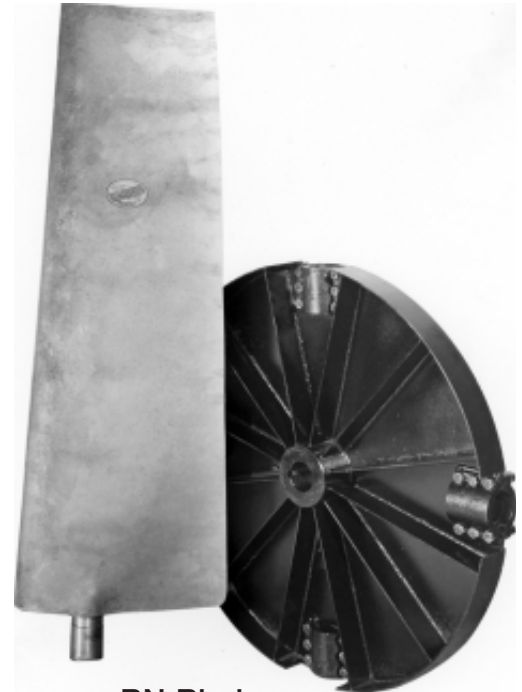
- **Airfoil Section** – Blades are alloy A535 aluminum, sand cast, ground to satin finish for balance.
- **Sizes** – 84" through 168", 4-blade and 6-blade assemblies.
- **Hub** – Welded steel construction.
- **Taper Lock Bushing** - Standard on all sizes.
- **Manual Adjustments** – Angle changes in the field are easily effected by loosening the blade clamps at each blade shank and rotating the blade to correct angle.
- **Balance** – Blades are statically balanced against a master. Hub is dynamically balanced.
- **Maximum Tip Speed** – 11,000 FPM.

Performance:

- **Air Flow** – High efficiency at low tip speeds.
- **Air Volume** – 50,000 to 500,000 CFM at free air.
- **Static Pressure** – Efficient operation from free air through 3/4" SP.
- **Fan Efficiency** – Hartzell Series 91 adjustable pitch fans can reach a maximum total efficiency of 75%. Average efficiency design is 65%.
- **Testing Method** – Fans are tested for sound and air ratings in Hartzell's Research and Development Center in accordance with industry standards. Typical Fan Performance Curve.

Special Design Features:

- **Stable Performance** – Top performance with low tip speed and low sound ratings.
- **Standard Rotation** – All sizes available in right-hand rotation only.
- **Maximum Temperature** – 200°F (93°C). High temperature construction available – Maximum 350°F (177°C).
- **Coatings** – Special coatings for application of Hartzell blades in corrosive atmospheres are available in a wide variety which include, but are not limited to, epoxy, bitumastic, and inorganic zinc.
- **Shipment** – Series 91 fans are shipped knocked down as standard.
- **Contact your local Hartzell representative for assistance.**
Call 1-800-336-3267.



BN Blade

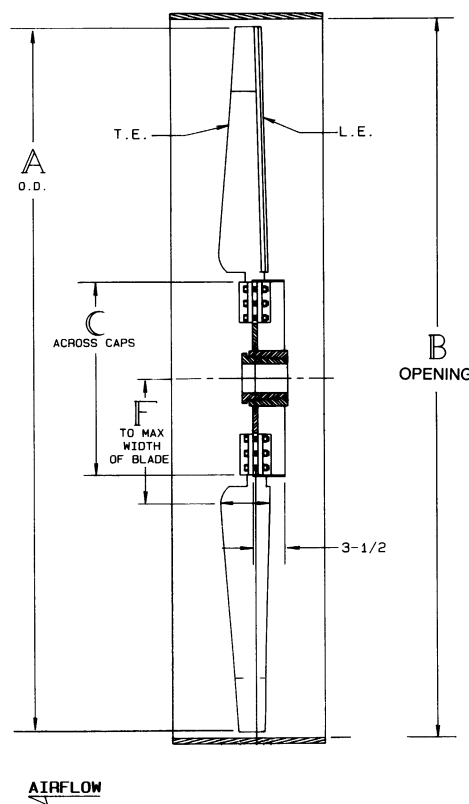
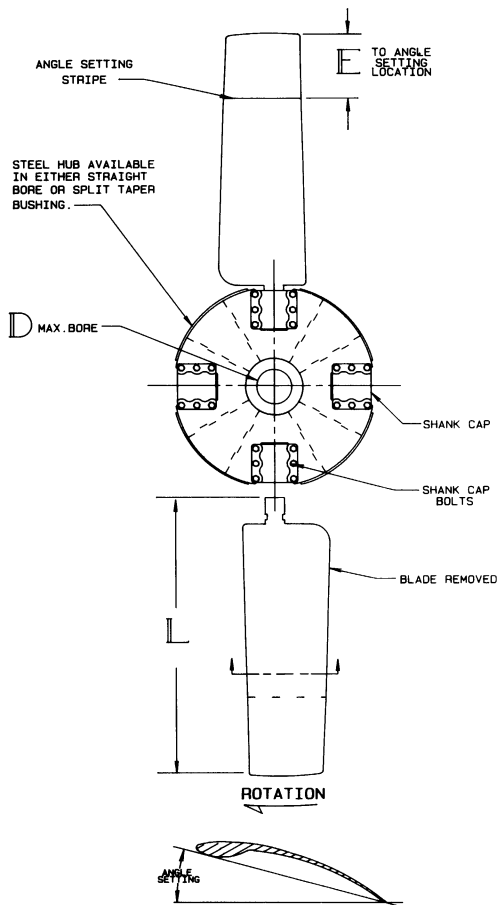
Fan Performance Curves and Complete Sound Data are Available Upon Request.

Dimensions

Principal Dimensions

FAN SIZE	84	96	108	120	132	144	156	168
A	84	96	108	120	132	144	156	168
B	85 ¹ / ₄	97 ³ / ₈	109 ¹ / ₂	121 ¹ / ₂	133 ¹ / ₂	146	158	170
C	19 ⁵ / ₈	19 ⁵ / ₈	24 ³ / ₄	24 ³ / ₄	30	30	41	41
D	4	4	4	4	4	4	4	4
E	8 ³ / ₈	14 ³ / ₈	12	18	15 ¹ / ₂	21 ¹ / ₂	22	28
F	21 ¹ / ₈	21 ¹ / ₈	26 ¹ / ₄	26 ¹ / ₄	31 ¹ / ₄	31 ¹ / ₄	42 ¹ / ₂	42 ¹ / ₂
Bolt	1/2 - 13 X	1/2 - 13 X	1/2 - 13 X	1/2 - 13 X	5/8 - 11 X	5/8 - 11 X	5/8 - 11 X	5/8 - 11 X
Ass'y	(4) Blade	191	203	352	369	440	460	582
Wgt.	(6) Blade	245	263	466	491	566	596	722
WR ²	(4) Blade	272	402	880	1172	1867	2370	3422
Lb. Ft. ²	(6) Blade	392	588	1289	1726	2755	3509	5875

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



NOTES:

1. 4-blade assembly shown. Available in 6-blade.
2. Available in right-hand rotation only.

Series 92 | Aluminum Adjustable Pitch Fan Assembly

Construction Features:

- **Airfoil Section** – Blades are alloy #319 aluminum, sand cast, ground to satin finish for balance.
- **Sizes** – 72" - 144", 4-blade and 6-blade assemblies.
- **Hub** – Cast aluminum with self-contained blade housing threaded to accept the blades. The 144" size fan has welded steel hub.
- **Split Taper Bushing** – Standard on all sizes.
- **Manual Adjustments** – Blades have threaded shanks, which screw into threaded aluminum hub sockets. The blade angle can be easily effected by loosening the hub bolts at each blade socket and rotating blade. Angle change on 144" steel hub can be effected by loosening blade clamps at each blade and rotating blade.
- **Balance** – Blades are statically balanced against a master. Hub is dynamically balanced.
- **Maximum Tip Speed** – 15,000 FPM.

Performance:

- **Air Flow** – Increased efficiency at higher pressure.
- **Air Volume** – 50,000 to 400,000 CFM at free air.
- **Static Pressure** – Efficient operation ranges from free air through 1.0" W.G.
- **Fan Efficiency** – Hartzell Series 92 adjustable pitch fans can reach a maximum total efficiency of 75%. Average efficiency for design is 65%.
- **Testing Method** – Fans are tested for sound and air ratings in Hartzell's Research and Development Center in accordance with industry standards.

Special Design Features:

- **Stable Performance** – Wide range in flow volume from medium to high blade angle settings.
- **Standard Rotation** – All sizes are available in right-hand rotation only.
- **Maximum Temperature** – 200°F (93°C). High temperature construction available – Maximum 350°F (177°C).
- **Coatings** – Special coatings for application of Hartzell blades in corrosive atmospheres are available in a wide variety which include, but are not limited to, epoxy, bitumastic and inorganic zinc. Hard coat anodized blades are available for increased corrosion and abrasion resistance.
- **Shipment** – Series 92 fans are shipped knocked down as standard.
- **Contact your local Hartzell representative for assistance.**
Call 1-800-336-3267.



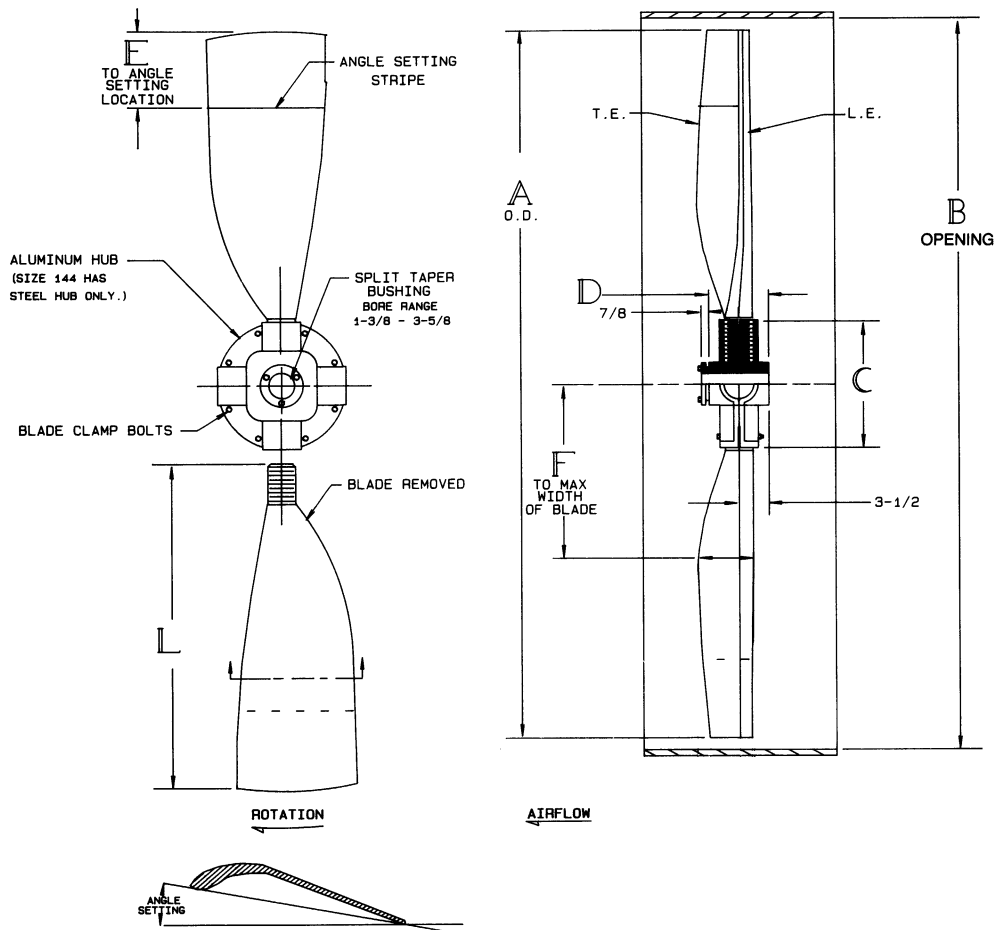
Fan Performance Curves and Complete
Sound Data are Available Upon Request.

Dimensions

Principal Dimensions

FAN SIZE	72	84	96	108	120	132	144
A	72	84	96	108	120	132	144
B	73	85 ^{1/4}	97 ^{3/8}	109 ^{1/2}	121 ^{1/2}	133 ^{1/2}	146
C	11 ^{3/4}	15	15	15	15	15	25
D		7	7	7	7	7	4
E	6	At Tip	At Tip	6	12	18	19
F	24 ^{3/8}	37 ^{1/2}	37 ^{1/2}	37 ^{1/2}	37 ^{1/2}	37 ^{1/2}	32
L	33 ^{3/16}	38 ^{1/2}	44 ^{1/2}	50 ^{1/2}	56 ^{1/2}	62 ^{1/2}	63 ^{1/2}
Ass'y	(4) Blade	80	165	189	197	205	409
Wgt.	(6) Blade	108 ^{1/4}	222	258	270	282	552
WR ²	(4) Blade	152	415	549	709	901	2547
Lb. Ft. ²	(6) Blade	218	611	813	1053	1341	3789

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

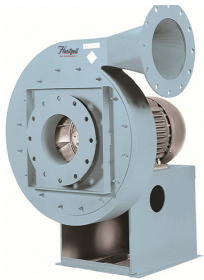


- NOTES:
1. 4-blade assembly shown. Available in 6-blade.
 2. Available in right-hand rotation only.

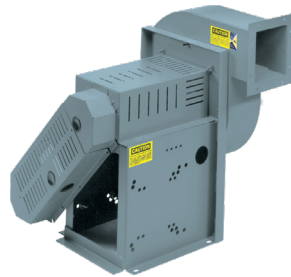
Hartzell

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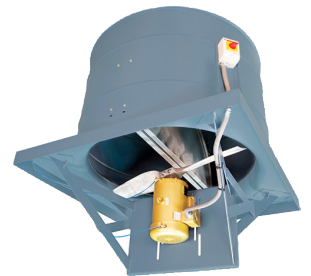
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More than 50 Hartzell representative offices can provide specific performance and installation data to meet your requirements. Call your Hartzell Air Movement representative for assistance. Visit www.hartzellairmovement.com or call 800.336.3267 for the name of your representative.

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Hartzell Air Movement · 910 S. Downing Street · Piqua, OH 45356-0919

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