Hartzell

AIR MOVEMENT

CORROSION RESISTANT

FIBERGLASS PRODUCTS

- Fiberglass Wall Ventilators
- Fiberglass Axial Flow Fans
- Fiberglass Roof Ventilators
- Fiberglass Centrifugal Exhausters
- Fiberglass Backward Curved Centrifugal Fans
- Fiberglass Radial Blowers
- Fiberglass In-Line Centrifugal Fans
- Fiberglass Air Control Products

Hartzell

AIR MOVEMENT

For more than 140 years, Hartzell has been synonymous with integrity, dedication, and innovation. We design and manufacture quality into every air moving product we deliver to provide the exceptional value our customers deserve. This is the way we have done business since our founding in 1875, and it remains our trusted commitment today.

Photo from show in 1957. Hartzell developed the first all-fiberglass fan for industrial use, which provided a more chemical resistant and lighter weight material than metal. Hartzell has been manufacturing fiberglass fans for over 50 years!

Customer Service

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

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Content

General Information

Corrosion Resistant Products

General Information

Our value-added benefits, include:

- One of the most complete AMCA-certified lines of industrial fans in the industry
- Optimum efficiency and maximum energy savings from every fan we produce
- Technological advancements in fan design and manufacturing for superior performance and long-lasting reliability
- Protection against corrosion from acids, gases, salts and solvents with corrosion resistant fiberglass products
- Quality fans backed by the industry's leader

ISO Certified 9001:2015

AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL ®
amca INTERNATIONAL

MEMBER

5 YEAR LIMITED WARRANTY

Hartzell Air Movement pioneered the development of fiberglass corrosion resistant fans and blowers. And today we manufacture one of the most complete lines of fiberglass products in the industry; a line that includes fans for general and process ventilation applications. Fiberglass construction is recommended where corrosive elements exist in fume or vapor form.

Hartzell Air Movement offers:

- A broad range of products for any corrosive application
- Corrosion-resistant fiberglass construction – lightweight, yet extremely strong for a long service life
- A variety of fiberglass props with airfoil design
- The only fiberglass wheel available in a solid, one-piece design from the mold – exclusive to Hartzell Air Movement
- Abrasion-resistant coating (HartKoate) – utilized when both moisture and corrosives exist in the airstream
- Time-tested, reliable performance and long-lasting durability

Fiberglass Products Overview

General Ventilation

Our fiberglass wall and roof ventilators are a major advantage for general ventilation applications where concentrations of corrosive elements exceed the limits of standard fans. Fiberglass also offers additional advantages such as lower weight, high strength to weight ratio and dimensional stability.

Fiberglass Wall Ventilators

Series 59 - Direct drive unit constructed of solid fiberglass. Temperatures up to 180ºF with specially insulated motors. Sizes 12" – 60" and 1,315 – 55,500 CFM at free air.

Fiberglass Centrifugal Exhausters

Low profile roof and wall exhaust solutions. Utilizes Type FE airfoil-bladed, one-piece, solid fiberglass wheel. Temperatures up to 125ºF. Sizes 12" – 40" and 500 – 22,000 CFM.

Series 82 - Direct Drive, Downblast
Series 83 - Belt Drive, Downblast
Series 87 - Direct Drive, Upblast
Series 88 - Belt Drive, Upblast

Fiberglass Roof Ventilators

Series 57 - Upblast, Direct Drive. Efficient, economical choice for mild corrosive atmosphere. Temperatures up to 180ºF with specially insulated motors. Sizes 28" – 60" and 7,300 – 51,000 CFM at free air.

Series 37 - Upblast, Belt Drive. Heavy-duty unit with motor out of airstream for severe corrosive elements. Temperatures up to 200ºF. Sizes 12" – 60" and 1,260 – 61,765 CFM at free air.

Series 58E - Hooded, Belt Drive. Complete protection from elements/weather. Temperatures up to 200ºF. Sizes 12" – 60" and 1,280 – 63,470 CFM at free air.

Process Ventilation – Axial

Fiberglass direct and belt drive axial flow fans designed for a corrosive air-stream application where standard metallic fans will not work due to the environment.

Fiberglass Duct Fans

Suited for applications with low static pressure.

Series 34 - Belt Drive unit with open end motor as standard. Other motor enclosures are available. Sizes 12" – 60" and 1,370 – 62,200 CFM at free air.

Series 28 - Direct Drive unit with totally enclosed chemical plant motor. Temperatures up to 180ºF with specially insulated motors. Sizes 12" – 60" and 1,325 – 66,700 CFM at free air.

Fiberglass Duct Axial Fans

Designed for maximum efficiency in the static pressure range of 1" to 3" at low speeds and low noise.

Series 35 - Belt Drive unit with open end motor as standard. Other motor enclosures are available. Sizes 12" – 60" and 470 – 70,000 CFM at 1" S.P.

Series 29 - Direct Drive unit with totally enclosed chemical plant motor. Temperatures up to 180ºF with specially insulated motors. Sizes 12" – 60" and 1,204 – 68,950 CFM at free air.

Fiberglass Bypass Fans

For use in a variety of corrosive applications. Motor out of airstream. Temperatures up to 200ºF with specially insulated motors. Sizes 24" – 48" and 6,012 – 46,145 CFM at free air.

Series 28B - Direct Drive. Type FW low pressure propeller

Series 29B - Direct Drive. Type E medium pressure propeller

Process Ventilation – Centrifugal

Fiberglass centrifugal fans offer non-overloading horsepower characteristics, high efficiency, low noise and economy for handling both fumes and vapors in a corrosive atmosphere.

Fiberglass Backward Curved Centrifugal Fans

Utilizes Type FA airfoil-bladed, one-piece, solid fiberglass wheel. Motor out of airstream. Temperature up to 250ºF. Sizes up to 60" and up to 100,000 CFM and S.P. to 30".

Series 41 - Belt Drive or Direct Drive

Series 41P - Belt Drive, Packaged

Series 41U - Belt Drive, Packaged, Utility Fan

Fiberglass In-line Centrifugal Fans

Series 40 - Belt Drive. Compact, efficient unit offers straight airflow for duct installations. Utilizes the Type FA airfoil-bladed, one-piece, solid fiberglass wheel in a vane-equipped drum. Identical inlet and discharge dimensions. Sizes 12" – 60" and 800 – 94,000 CFM and S.P. to 14".

Fiberglass Radial Blowers

Series 42 - Direct or Belt Drive, SWSI. Suited for lab hood installation at static pressures from 0" - 8". Available in two arrangements. Sizes 10" – 14" and 100 – 2,000 CFM and S.P. to 12".

Series 43 - Belt Drive, SWSI. Versatile blower designed for static pressures up to 16" W.G. Available in three arrangements. Sizes 16" – 33" and 250 – 18,000 CFM S.P. to 18".

Air Control Products

Hartzell's fixed bladed louvers, end-pivoted shutters, and our center-pivoted low-velocity and high-velocity dampers help prevent back drafts and control air intake or relief. Designed for corrosive applications. These are available in standard and custom sizes.

Fiberglass Fixed Blade Louvers

Series FFL - For air intake, exhaust or pressure relief applications.

Fiberglass End-Pivoted Shutters

Series FEP - Low velocity. For gravity back-draft prevention in low pressure applications.

Fiberglass Center-Pivoted Dampers

Manually or motor operated.

Series FLC - Low Velocity. For back-draft prevention in low pressure applications.

Series FCO - High Velocity. Opposed Blade. For volume control and back flow prevention in medium to high pressure applications.

Series FCP - High-Velocity. Parallel Blade. For volume control and back flow prevention in medium to high pressure applications.

Along with the variety of products listed here, we also build customized fans to meet your specific requirements. Talk to your local sales representative today!

Advantages of Fiberglass Construction

A variety of corrosion problems plague the water and wastewater industry. Although fans and blowers made of coated steel or metals such as stainless, Hastelloy and monel can handle some of these challenges, Hartzell's fiberglass products provide unsurpassed resistance to a great majority of corrosive elements at a cost substantially below that of corrosion resistant metals. *Please refer to the Corrosion Resistance Guide on page 79 for information on specific chemicals and temperature limitations.*

Apart from the primary consideration that **fiberglass offers superior corrosion resistant properties**, fiberglass also offers these additional advantages:

- Weighs 25% - 50% less than comparable equipment made of metal alloys
- Has an extremely high strength-to-weight ratio, stronger than steel on a per-pound basis
- The dimensional stability is excellent
- Will not become brittle at low temperatures and at -40°F laminated fiberglass will be stronger than at room temperature
- Offers a distinct price advantage over stainless and Monel (as much as 1/3 in original cost)
- Has a longer service life and requires less maintenance
- Offers weather-resistant characteristics – it will not tarnish and will never need painting
- Is extremely durable and highly resistant to impact

When optional surface veil, electrical grounding and dynamic balancing are applied, Hartzell Air Movement conforms to ASTM D4167-97 and ASTM E84-2008 Standard Specifications for Fiber-Reinforced Plastic (FRP) Fans and Blowers.

Series Comparison Charts

Hartzell FRP Centrifugal Fans – Series Comparison Chart

	Drive Type		Mounting Types			Location		Motor Location		Performance		
Series	Belt	Direct	Floor	Roof Curb	Wall	Indoor	Outdoor	Out of Air-stream	In Airstream	Maximum Volume (CFM)	Maximum S.P. (in. W.G.)	Page #
40	X		X	X	X	X	X	X		94,000	14	45
41	X	X	X			X	X	X	Shaft only on direct drive units	100,000	30	30
41P	X		X			X	X	X		32,000	12	36
41U	X		X			X	X	X		10,300	6	39
42	X	X	X			X	X	X	Shaft only on direct drive units	2,000	12	63
43	X	X	X			X	X	X	Shaft only on direct drive units	18,000	18	65
82		X		X	X	X	X	X	Shaft only	3,500	3	15
83	X			X			X	X		16,600	3	15
87		X		X	X	X	X	X	Shaft only	3,700	3	15
88	X			X			X	X		22,400	3	15

Hartzell FRP Axial Fans – Series Comparison Chart

	Drive Type		Mounting Types			Location		Motor Location		Performance		
Series	Belt	Direct	Floor	Roof Curb	Wall	Indoor	Outdoor	Out of Air-stream	In Airstream	Maximum Volume (CFM)	Maximum S.P. (in. W.G.)	Page #
28		X	X	X	X	X	X		X	65,800	1.25	53
28B		X	X	X	X	X	X	X	Shaft only	65,800	1.25	52
29		X	X	X	X	X	X		X	64,900	4.5	53
29B		X	X	X	X	X	X	X	Shaft only	64,900	4.5	52
34	X		X	X	X	X	X	X		62,500	1.25	55
35	X		X	X	X	X	X	X		65,000	4	56
35V	X		X	X	X	X	X	X		65,000	4	58
37	X			X			X	X		66,000	0.75	21
57		X		X			X		X	51,200	0.75	20
58E				X			X	X		54,900	0.75	23
59		X			X	X	X		X	55,700	0.75	9

Basics of Fan Selection

The first consideration in any fan selection is the amount of air to be moved and the resistance to this air movement. With specific performance and application criteria in mind, propeller and centrifugal fan selections typically require decisions based on the following criteria.

Belt Drive vs. Direct Drive

Belt drive fans offer the ability to adjust fan speed for system balancing if necessary. They also offer more flexibility in speeds and motor selections. In a cost comparison, belt drive fans are typically less costly than comparable size direct drive fans with low speed motors.

Direct drive fans are often preferred for jobs where maintenance access is difficult. Maintenance costs are generally lower with direct drive fans since there are no belts or bearings to replace and no pulleys to adjust.

Larger Fans vs. Smaller Fans

In most applications, several fans may meet the specified airflow and pressure requirements. Just as larger fans tend to turn slower and generate less sound, they also tend to have higher initial costs but lower operating costs. Smaller fans have more stable performance curves, lower initial costs, higher sound levels and higher operating costs because of their higher speeds.

Low Sound vs. High Static Pressure

Fans selected for high static pressures run at higher speeds and produce higher tip speeds resulting in higher sound levels. Conversely, in low pressure applications fans generally run at lower speeds, produce lower noise levels and are recommended for sound sensitive applications.

How Accessories Affect Static Pressure

All accessory losses must be accounted for when calculating the static pressure load for a fan. For example, when fans are used in conjunction with properly applied accessories, lower pressure capabilities can be specified.

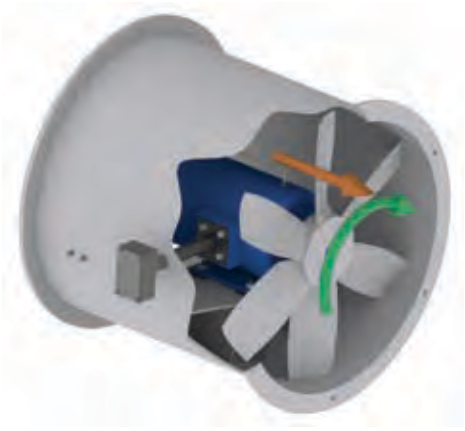
When fans are over-specified to compensate for losses that do not actually exist, both cost and sound levels can be higher than necessary. This most commonly results from larger motors and higher tip speeds.

Motor Service Factor

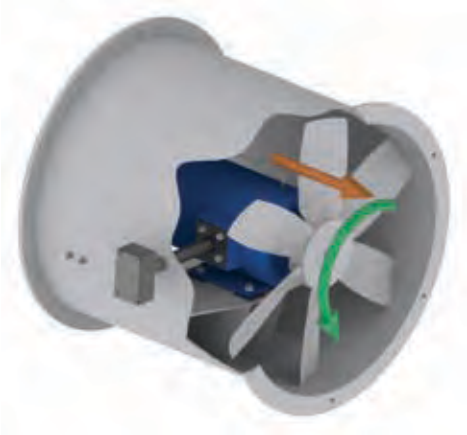
Some motors are cooled by the airstream. With an uninterrupted flow of cooling air, motors may be operated in their service factor range (up to 15% above the motor nameplate horsepower without damage due to overheating. Less overloads are recommended for applications using totally enclosed or explosion resistant motors.

Propeller Fan Rotation Guide

The propeller blade should cut and throw the air when rotating in the correct rotation as shown in the Hartzell Series 28 duct fan below.
Note: The orange arrow represents air flow. The green arrow represents propeller rotation.



CLOCKWISE ROTATION



COUNTER-CLOCKWISE ROTATION

Hartzell

AIR MOVEMENT

Fiberglass Wall Ventilators

SERIES 59

Series 59

Fiberglass Direct Drive Wall Ventilator

Hartzell Fiberglass Direct Drive Wall Ventilators are designed for general ventilation where corrosive elements exist in fume or vapor form. The units are manufactured out of solid fiberglass and designed to pass through a framed up wall opening as a complete assembly, either by itself, or with accessories.

Hartzell wall ventilators utilize a highly efficient, one-piece, solid fiberglass airfoil type propeller from an RTM mold. The fan housing incorporates the Hartzell Air Seal, which allows the orifice ring to overlap the propeller tips. This practically eliminates back flow of air and increases efficiency by 10% or more by minimizing air friction through the fan.

Features:

- **Sizes –** 12" to 60"
- **Performance –** 1,315 to 55,500 CFM at free air
- **Temperature –** Suitable for temperatures up to 180°F (Specially insulated motors are required for temperatures above 104°F.)
- **FRP Construction –** Standard FRP components are constructed of fiberglass and vinylester resin. See the Corrosion Resistance Guide on page 79 for resin characteristics. Other resins are available.
- **Unit Construction –**

  Fan housing – One piece molded fiberglass fan housing with solid fiberglass motor support base. Fan housing includes venturi orifice to increase efficiency and seal propeller tips.

  Motor mounting base – Fabricated of solid fiberglass, designed to maximize strength and minimize restrictions to air flow.

  Propellers – One piece fiberglass airfoil construction, electronically balanced on unit at operating speed.
- **Motors –** Totally enclosed mill and chem motors are standard. Other motors are available upon request.
- **Hardware –** Stainless Steel motor mounting hardware is standard. Monel hardware is available at an extra cost. Fiberglass accessory mounting hardware is standard.

Series 59 Fiberglass Wall Ventilator with a Series FEP Fiberglass End Pivoted Automtic Shutter used for building exhaust.

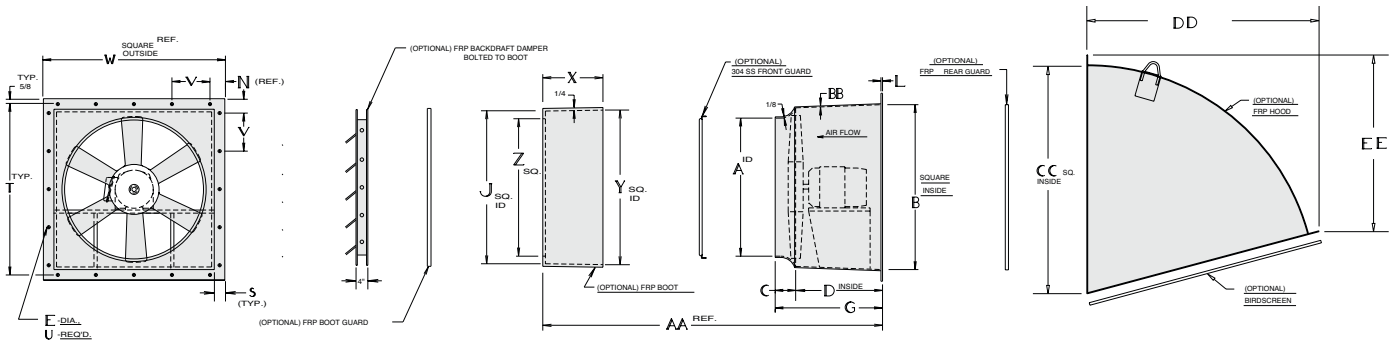
For performance data, please visit www.hartzellflow.com or contact your local sales representative.

Options & Accessories

Refer to pages listed below for details.

Hartzell Air Movement certifies that the Series 59, Fiberglass Direct Drive Wall Ventilator shown herein is licensed to bear the AMCA Seal for air performance. Ratings are based on tests and procedures performed in accordance with AMCA Standard 211 and comply with the requirements of the Certified Ratings Program. For performance data, please visit www.hartzellflow.com or contact your local sales representative.

Dimensions

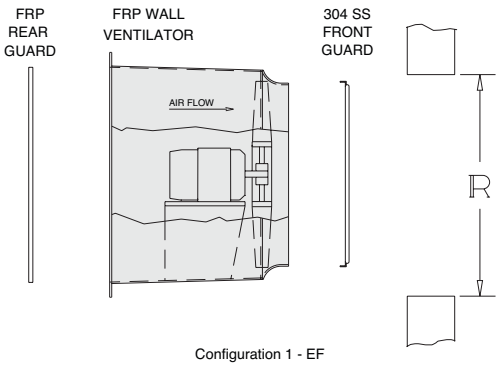


Principal Dimensions (inches) – Series 59

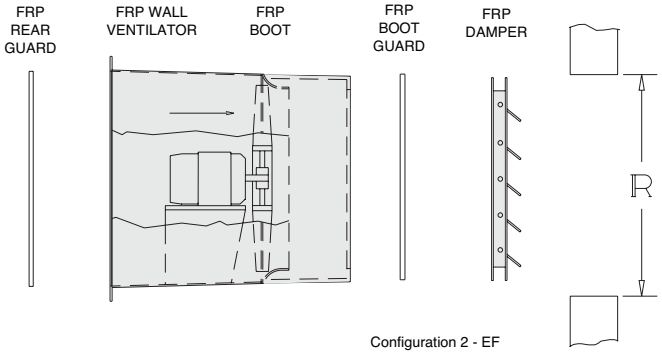
Fan Size	A	B	C	D	E	G	J	L	N	R	S	T	U
12	12¼	16½	1⅝	13⅜	5/16	15	16⅜16	¼	4	17¼	1½	18¾	12
16	16⅝16	20½	2⅛	13⅞	5/16	16	20⅜16	¼	4	21¼	1½	22¾	12
18	18¼	22½	2¼	15¾	5/16	18	22⅜16	¼	4	23¼	1½	24¾	12
20	20⅝16	25½	2½	15½	5/16	18	25⅜16	¼	4½	26¼	1½	27¾	12
24	24⅝16	28¾	3¼	15¾	5/16	19	28⅜16	⅜	4¾	29¾	1½	31¼	20
28	28⅝16	33¾	3¼	16¼	5/16	19½	33⅜16	⅜	4¾	34¾	1½	36¼	20
30	30⅝16	35¾	3½	17¼	7/16	20¾	35⅜16	⅜	5¼	36¾	2	39¼	20
32	32⅝16	36¾	3⅜18	18⅜	7/16	21½	36⅜16	⅜	5¼	37¾	2	40¼	20
36	36⅝16	42¾	3⅜	19⅜	7/16	22¾	42⅜16	⅜	5¼	43¾	2	46¼	20
40	40⅝16	47	3⅝	23⅜	7/16	27	46⅜16	½	5½	48¼	2	50¾	20
42	42⅝16	49	4¾	22¼	7/16	27	48⅜16	½	5⅝	50¼	2	52¾	20
44	44⅝16	51	4½	24½	7/16	29	50⅜16	½	6	52¼	2	54¾	20
48	48⅝16	55	4¼	24¾	7/16	29	54⅜16	½	5⅛16	56¼	2	58¾	28
54	54⅝16	61	4⅜	24⅝	7/16	29	60⅜16	½	5⅛16	62¼	2	64¾	28
60	60⅝16	67	5½	24½	7/16	30	66⅜16	½	5⅛16	68¼	2	70¾	28

Fan Size	V	W	X	Y	Z	AA	BB	CC	DD	EE	Max. Motor Frame	Approx. Wt. # Less Motor & Options
12	6	20	13¾	16⅜	12½	27¼	¼	21	22¼	17⅛16	48	30
16	8	24	14⅛	20⅜	16½	28⅛	¼	30	31⅛16	23¾	56	35
18	9	26	14½	22⅜	18½	30⅜	¼	30	31⅛16	23¾	56	40
20	10	29	14½	25⅜	20½	30⅛	¼	30	31⅛16	23¾	184T	45
24	5¾	32½	15½	28⅜	24½	31⅜	¼	39	39⅝	30⅞16	184T	60
28	7	37½	15½	33⅜	28½	31⅞	¼	39	39⅝	30⅞16	184T	75
30	7½	40½	15½	35⅜	30½	32⅞	¼	48	48⅜	37⅛16	215T	85
32	7¾	41½	15½	36⅜	32½	34	¼	48	48⅜	37⅛16	215T	110
36	9¼	47½	16½	42⅜	36½	35½	¼	56	56	43	215T	125
40	10¼	52	16⅜	46⅜	40½	39⅞	⅜	69	68⅝	52⅝	254T	230
42	10¹¹⁄16	54	16¾	48⅜	42½	39⅛	⅜	69	68⅝	52⅝	254T	240
44	11	56	16¾	50⅜	44½	41⅜	⅜	69	68⅝	52⅝	254T	255
48	8⅝16	60	16¾	54⅜	48½	41⅝	⅜	69	68⅝	52⅝	256T	290
54	9⅝16	66	17	60⅜	54½	41¾	⅜	79	78¼	60⅛16	256T	305
60	10⅝16	72	17½	66⅜	60½	42⅛	⅜	89	87⅞	67⅞16	256T	320

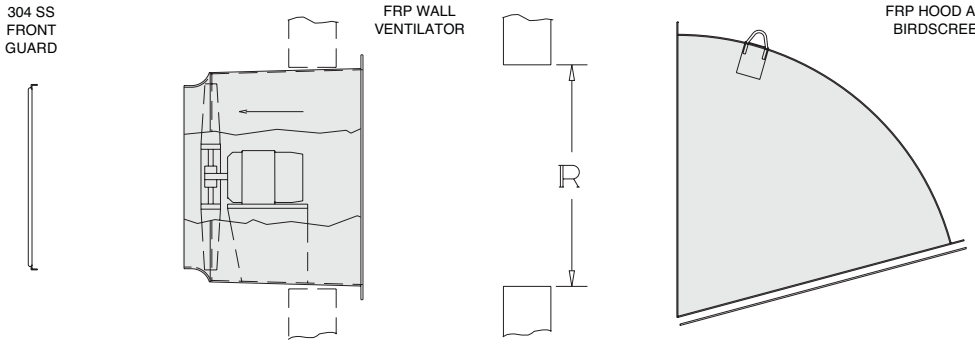
Accessory Mounting Configurations



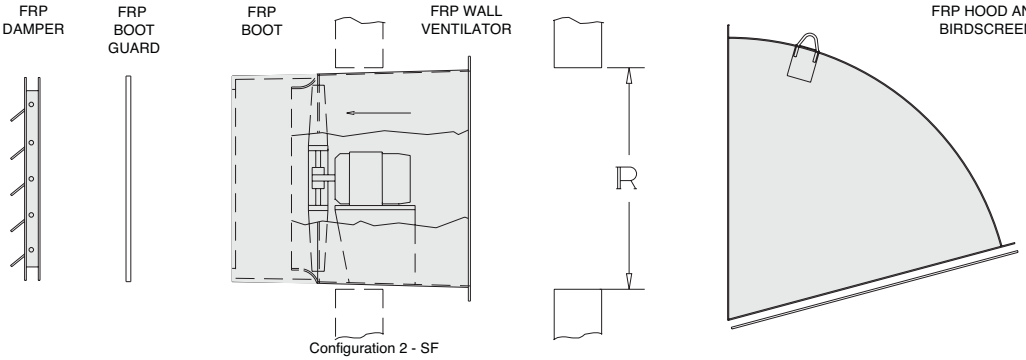
Configuration 1 - EF



Configuration 2 - EF



Configuration 1 - SF



Configuration 2 - SF

NOTES: 1. The Series 59 fiberglass panel fan is designed with a slight draft in the fan housing to accommodate slip-fit installation. The mounting flange located at inlet side of housing is standard. **An optional fiberglass mounting flange can be supplied on the housing at a customer specified location.**

2. Fiberglass hoods are available for exhaust flow applications. This configuration requires special space and mounting considerations. Please contact the factory.

Options and Accessories

Abrasive/Erosive Resistant Coating

HartKoate is an abrasive/erosive resistant coating developed by Hartzell Air Movement for application in environments where abrasive/erosive conditions may exist. HartKoate helps prevent premature deterioration of equipment in environments where uncoated fans may fail.

HartKoate is applied to a 50-60 mil thickness suitable for temperatures to 200°F.

HartKoate is particularly appropriate for use when water mist and/or abrasive particles exist in the airstream.

Contact your Hartzell representative for further details concerning the application of HartKoate coating to fiberglass fans in corrosive atmospheres.

Hi-Cor Construction

All airstream surfaces exposed to corrosive environment will be protected with a layer of Synthetic (Nexus) surfacing veil. An additional final coat of resin will be applied for extra corrosion resistance.

When Hi-Cor construction is required, the factory should be consulted concerning the corrosive environment involved.

Electrostatically Grounded

For applications in which fiberglass products are handling gas fumes that are not only corrosive but also potentially explosive, the equipment should be specially constructed to control and remove static electricity. Interior airstream surfaces can be coated with a “carbon rich” resin coat.

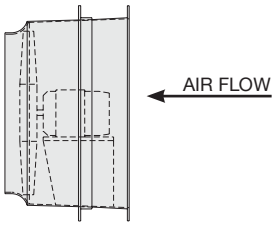
Grounding straps are secured from the side of the housing to the fan’s steel base. All that remains to effectively ground the airstream is to ground the fan base at the time of installation.

ASTM D4167-97 Construction

(ASTM D4167-97, Standard Specification for Fiber-Reinforced Plastic Fans and Blowers.) For corrosive systems where ASTM construction is specified this construction option adds: synthetic veil and electrostatically conductive surface coating applied to airstream housing and impeller surfaces, special nameplates, and special final dynamic balancing to fan.

Mounting Flange

Constructed of solid fiberglass, the flange allows the fan to be mounted in the wall opening at the customer’s specified depth. It is permanently mounted to the fan at the factory per customer specified location or it can be shipped loose if a location is not specified.



Shutter Mounting Boot

Constructed of solid fiberglass, the boot is molded to the fan housing at the factory, and is used to ensure proper spacing between the fan and the optional shutters.

Fiberglass Shutter

Constructed of solid fiberglass, shutters are available in end or center pivoted and in automatic, manual, or motor operated. Epoxy coated steel shutters, or shutters constructed of galvanized steel, stainless steel or aluminum are also available.

The Hartzell solid fiberglass automatic back draft damper is constructed entirely of fiberglass, minimizing corrosion problems associated with metal in the airstream. These shutters are available in standard sizes to match the Hartzell shutter mounting boot. These shutters are also available built to specified customer dimensions. Contact your local Hartzell representative for assistance.

Series FEP
Fiberglass End- Pivoted Automatic Shutter

Wall Ventilator Guards

304 stainless steel front guards, FRP rear guards and FRP shutter boot guards are available.

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

Hartzell

AIR MOVEMENT

Fiberglass Centrifugal Exhausters

SERIES 82
SERIES 83
SERIES 87
SERIES 88

Fiberglass Centrifugal Exhausters

Hartzell Fiberglass Centrifugal Exhausters provide a low profile roof or wall exhast solution in both downblast and upblast configurations. They provide a major advantage for general ventilation applications where concentrations of corrosive elements exceed the limits of standard fans. The fiberglass construction is not only resistant to corrosive elements, but also provides additional advantages such as weight, high strength to weight ratio and dimensional stability.

Standard Construction Features

- **Construction –** All structural parts in the airstream are either fiberglass resin or epoxy coated stainless steel. All fiberglass surfaces are protected with a minimum 10-mil thickness of chemical, flame, and ultraviolet resistant resin.
  - **Housing –** Constructed of fiberglass and a corrosion resistant vinyl ester resin with a class I flame spread rate of 25 or less
  - **Wheels –** Constructed of fiberglass and a corrosion resistant vinyl ester resin with a class I flame spread rate of 25 or less
- **Hardware –** All internal hardware (airstream) is Type 304 stainless steel. All internal hardware (out of airstream) is zinc plated.
- **Shaft Seal –** A fiberglass and neoprene shaft seal is placed where the shaft leaves the housing.
- **Wiring Access –** Conduit tube between the motor enclosure and the curb panel provides wiring access without additional roof penetration.

For Direct Drive Units:

- **Shafts –** Direct drive units have extended shaft motors with mild steel shafts. 304 or 316 stainless steel or monel shafting is available as an option at an extra cost.

For Belt Drive Units:

- **Shafts –** Turned, ground, polished, keyed at both ends and fiberglass enclosed in the airstream. Shafts are sized to operate well below critical speed. 304 or 316 stainless steel or monel shafting is available as an option at an extra cost.
- **Bearings –** Bearings are heavy-duty, deep row radial ball type, self-aligning and shielded in cast iron housings. Long inner races insure even load distribution, providing a high radial and thrust load capacity. Bearings are relubricable.
- **V-Belt Drives –** Oversized for long life and continuous duty. Fixed pitch or variable pitch drives are available upon request. Belts are oil, heat and static resistant type.

Series 88 Fiberglass Exhauster

Type FE Wheel

The Type FE wheel is unique in the fan and blower industry. It is manufactured as a single fiberglass piece using a multi-section RTM mold, ensuring that each wheel is aerodynamically identical and provides reliable, repeatable performance without the variability of hand-made and taped components. The superior design is a result of a substantial investment in research, development, tooling, and manufacturing methods by Hartzell Air Movement.

Features – Type FE wheels are highly efficient with a tapered inlet side and airfoil blades and have a non-overloading horsepower characteristic curve. When used in conjunction with a precision inlet cone it efficiently moves large volumes of air at high pressures with low noise characteristics at low RPM.

Construction – Type FE wheels are solid fiberglass, die formed and coated with Derakane 510-A corrosion resistant vinylester resin. The fiberglass resin has a Class I flame spread rate of 25 or less. Special constructions are available for abrasive or extremely corrosive environments.

Balancing – Each wheel is electronically, statically and dynamically balanced according to the requirements of Fan Application Category BV-3 of AMCA/ANSI Std. 204-96. Each wheel is also operationally tested and inspected before shipment.

Hartzell offers the only fiberglass wheel available in a solid, one-piece design from the mold.

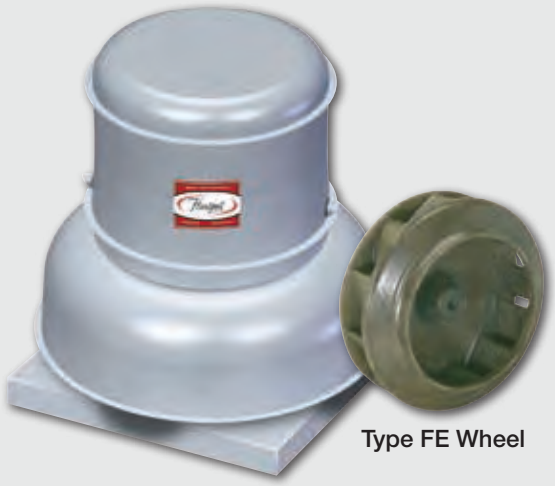
- Solid, one-piece design from an RTM mold – up to 60” dia.
- Highly efficient with a tapered inlet side and airfoil blades
- Non-overloading horsepower characteristic curve
- Available in 12” - 40” diameters for Series 82, 83, 87 and 88
- Available in clockwise rotation

Series 82 & 83 (Downblast)
Series 87 & 88 (Upblast)
Fiberglass Exhausters

Features:

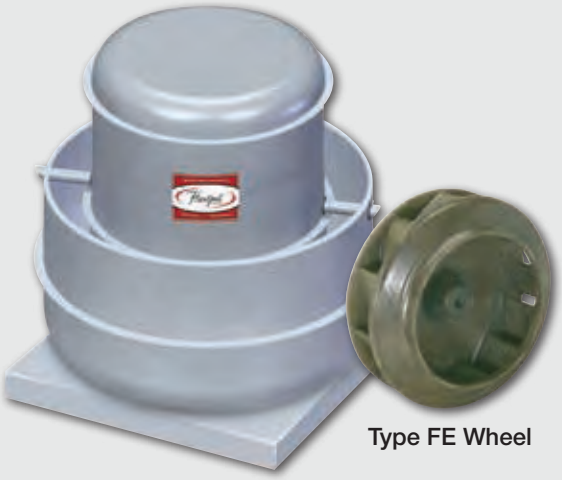
- **Applications –** Examples include paint and chemical storage facilities, gas transmission pump houses, battery charging facilities and wastewater/odor control pumping stations.
- **Sizes –** 12" to 40"
- **Performance –** 500 to 22,000 CFM
- **Temperature –** Suitable for temperatures up to 125°F
- **Motor –** Direct drive motors are standard with an extended shaft. Belt drive motors are standard t-frame. Motor and drive components are protected from the airstream and internal isolation to minimize vibration. They are available in single or three phase, with two-speed and explosion proof motors available on some models.
- **FRP Materials –** The dome ventilators consist of a fiberglass housing, fiberglass curb cap, and fiberglass motor cover all constructed of vinylester resin. The solid fiberglass wheel is molded with Dow Derakane 510-A corrosion resistant vinylester resin. The unit has a formed fiberglass venturi inlet and outlet. All airstream hardware is 304 SS.
- **Type FE Wheel –** High efficiency, solid fiberglass wheel built in one piece using a multi-section mold. This process insures repeatability and provides sealed, stronger joints. The tapered inlet side and airfoil design efficiently moves large volumes of air at high pressures. The wheel has non-overloading horsepower characteristic curve.

Series 88 Fiberglass Exhauster with Electrostatic Grounding and Hoods



Type FE Wheel

Series 82 (Direct Drive)
Series 83 (Belt Drive)



Type FE Wheel

Series 87 (Direct Drive)
Series 88 (Belt Drive)

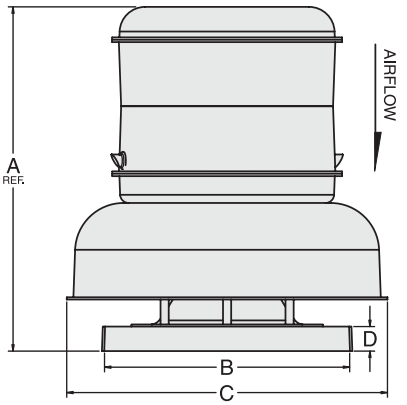
The AMCA Certified Ratings Seal does not apply to Series 87, Fiberglass Upblast Exhausters.

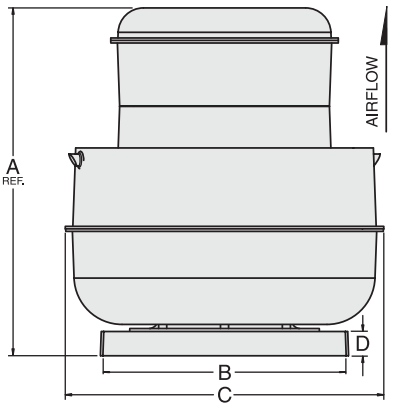
Hartzell Air Movement certifies that the Series 82 and Series 83 Fiberglass Downblast Exhausters and the Series 88 Fiberglass Upblast Exhausters shown herein, are licensed to bear the AMCA Seal for sound and air performance. Ratings are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311, and comply with the requirements of the AMCA Certified Ratings Program. For performance and sound data, please visit www.hartzellflow.com or contact your local sales representative.

For performance data, please visit www.hartzellflow.com or contact your local sales representative.

Options & Accessories

Refer to pages listed below for details.





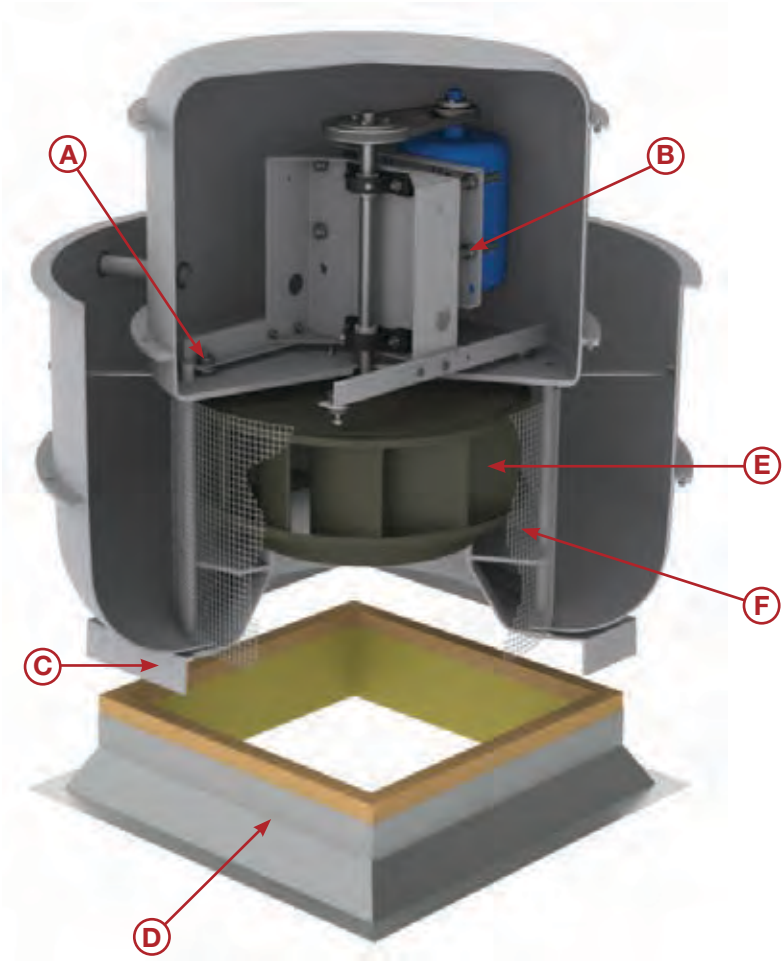
Principal Dimensions (inches) – Series 82 & 83 Downblast

Fan Size	A (Ref)	B	C	D
12	32 7/16	20	30	2
15	33 3/16	24	34 7/8	2
18	42 1/2	30	39 1/4	3
24	46	30	49 5/8	3
30	55 7/8	36	54 3/8	3
36	60 1/2	42	64 5/8	3
40	63 3/4	48	64 5/8	3

Principal Dimensions (inches) – Series 87 & 88 Upblast

Fan Size	A (Ref)	B	C	D
12	32 15/16	20	30	2
15	33 7/16	24	34 7/8	2
18	42 3/4	30	39 3/8	3
24	46 1/4	30	49 5/8	3
30	56 1/8	36	54 3/8	3
36	60 3/4	42	64 5/8	3
40	64	48	64 5/8	3

Series 88 Cross-Section View



A. Vibration Isolator
Reduces vibration and noise transfer between drive system and fan housing.

B. Drive Tensioning Bolts
Provides easy method to adjust belt tension.

C. Curb Panel
Integral adapter to aid in securing the fan to a roof curb.

D. Prefabricated Roof Curb (Optional)
Fiberglass prefabricated roof curbs are designed for metal, concrete or wood roof decks that are not surface insulated. They are available for flat, slope or peak roof installation in 8" or 12" heights. Custom curb construction is also available.

E. Type FE Wheel
Highly efficient, solid fiberglass wheel, built in one-piece using a multi-section mold, with a tapered inlet side, airfoil blades and a non-overloading horsepower characteristic curve. Available in clockwise rotation.

F. Birdscreen (Optional)
Stainless steel guard protects fan from birds and large debris.

Options and Accessories

ASTM D4167-97 Construction

(ASTM D4167-97, Standard Specification for Fiber-Reinforced Plastic Fans and Blowers.) For corrosive systems where ASTM construction is specified this construction option adds: synthetic veil and electrostatically conductive surface coating applied to airstream housing and impeller surfaces, special nameplates, and special final dynamic balancing to fan.

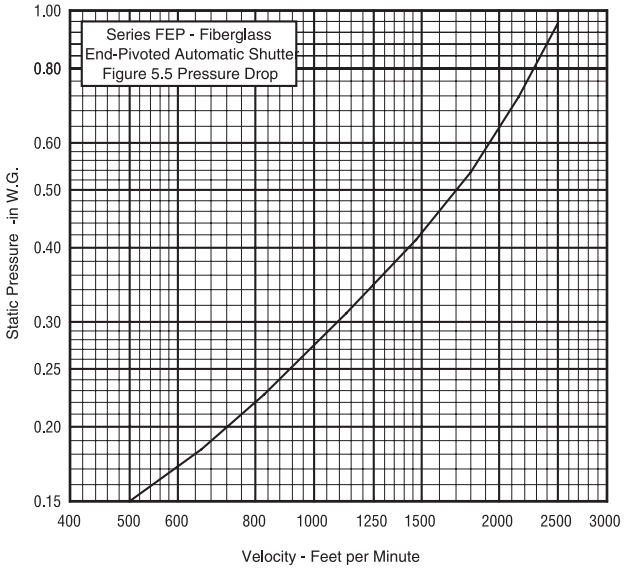
Optional Heavy-Duty Dampers

The Hartzell Series FEP are end-pivoted, gravity backdraft shutters constructed entirely of fiberglass.

- Maximum Temperature: 200°F
- Maximum Face Velocity: 2,500 FPM
- Maximum Differential Pressure: 1" W.G.
- Shipped loose for field mounting in roof curb.

Series FEP
Fiberglass End-Pivoted Automatic Shutter

Performance Data



Disconnect Switch

Shipped loose for field mounting.

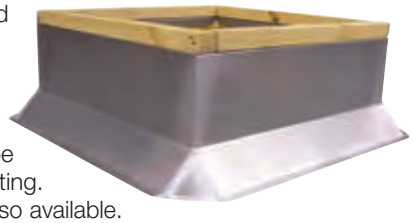
Bird Screen

304 stainless steel birdscreen available on all exhausters.

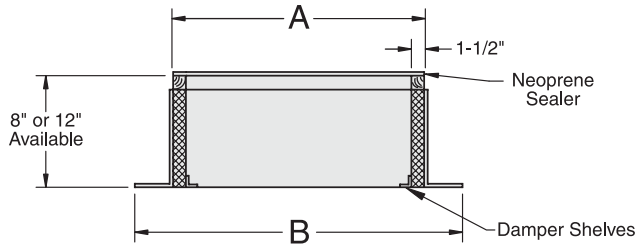
Prefabricated Curbs

The CT-1 fiberglass prefabricated curb shown is for flat roof installation of Hartzell centrifugal exhauster. The curb is designed for metal, concrete or wood roof decks that are not surface insulated. The curb is available either 8" or 12" high.

Model IRC-1 prefabricated curb constructed of galvanized steel is also available with identical features as Model CT-1. Galvanized models can be furnished with epoxy coating. Aluminum construction also available.



All prefabricated curbs can be furnished for slope or peak bases. Prefabricated curbs are designed to support the weight of the fans cataloged herein and attachments not exceeding over 100 additional pounds in a 40 mph wind. Nonstandard curb construction is available.



Principal Dimensions (in.) – Series 82, 83, 87, 88

Fan Size	12	15	18	24	30	36	40
A	19¼	23¼	29¼	29¼	35¼	41¼	47¼
B	27¼	31¼	37¼	37¼	43¼	49¼	55¼

Series 88 Fiberglass Exhauster with Custom FRP Base

Hartzell

AIR MOVEMENT

Fiberglass Roof Ventilators

SERIES 57

SERIES 37

SERIES 58E

Fiberglass Roof Ventilators

Hartzell Fiberglass Roof Ventilators are a practical choice for industrial applications where corrosive elements exist in fume and vapor form. They are designed and engineered to provide positive and accurate ventilation, regardless of internal plant and weather conditions.

The design utilizes a highly efficient fiberglass airfoil propeller in a heavy-duty, corrosive resistant fiberglass housing. The housing is extremely durable and highly resistant to impact.

In addition, the units offer weather-resistant characteristics because of their fiberglass construction. They will not tarnish and will never need painting.

Standard Construction Features

- **Housings –** Constructed of a corrosion resistant vinylester resin with a class I flame spread rate of 25 or less
- **FRP Construction –** All structural parts in the airstream are fiberglass and resin. All taped joints inside the shell or body are three layers of two ounce material. After assembly, internal surfaces are coated with two coats of resin and external parts and surfaces are given one coat of resin.
- **UV Inhibitor –** A UV inhibitor is added to the final coat of resin.
- **Shafts & Hardware –** Airstream shafts, bolts, and screws are 304 SS. Monel shafting and hardware are available as an extra-cost option for applications such as hydrochloric, hydrofluoric, or sulfuric acids, which attach stainless. Where metal is subject to attack by the corrosive elements being handled, all metal parts can be resin-coated after assembly.
- **Propellers –** are of one-piece construction, die formed of individual laminations of cloth mat plus woven roving.

For Belt Drive Units:

- **Bearing Covers –** Sealed with plastic foam tape and bolted to the bearing base.
- **Shaft Seal –** A fiberglass and neoprene shaft seal is placed where the shaft leaves the bearing cover along with a neoprene shaft slinger on the fan shaft between the propeller and seal. The seal is not gas tight.

Installation Data

In the past, the majority of plant ventilation was accomplished by sidewall ventilation. However, this type of ventilation required extensive and expensive ductwork and proved to be inferior to roof ventilation.

Roof ventilators use little valuable internal space and offer the flexibility of rearranging production equipment without reconstructing ventilation systems and moving ductwork.

Hartzell offers three types of fiberglass roof ventilators, each designed with a particular type of installation in mind, to meet the majority of industrial corrosive applications.

Series 57: Fiberglass Upblast Roof Ventilator – Direct Drive
An efficient and economical choice for general ventilation or mildly corrosive atmospheres.

Series 37: Fiberglass Upblast Roof Ventilator – Belt Drive
A heavy-duty unit with the motor out of the airstream, best suited for application where severely corrosive elements exist or where the versatility of belt drive is required. Can be located at the end of ductwork.

Series 58: Fiberglass Hooded Roof Ventilator – Belt Drive
Provides complete protection from the elements for an exhaust operation.

Plant Layout

To design the plant ventilation layout, first determine the amount of CFM required:

1. Multiply the dimensions of the ventilated area to figure the cubic feet.
2. Take the cubic feet of the ventilated area and divide by the air exchange rate to figure the amount of CFM required.

EXAMPLE:
Ventilated Area: 120’ x 50’ x 20’
Air Exchange Rate: One change every 5 minutes

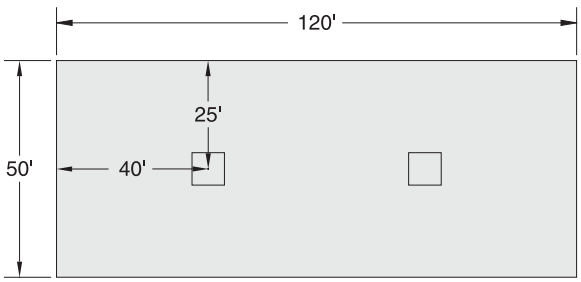
120’ x 50’ x 20’ = 120,000 cu. ft.
120,000 cu. ft. ÷ 5 min. = 24,000 CFM

Second, determine the size and number of units needed to meet those requirements:

1. Divide the amount of CFM required by the number of units desired (in this case, 2) to figure the capacity requirement for each ventilator.

24,000 CFM ÷ 2 units = 12,000 CFM

Note: Symmetrical spacing should be used whenever possible; however, care must be taken to adequately ventilate particularly troublesome areas.



Series 57

Upblast, Direct Drive, Roof Ventilator

Series 57 Upblast Roof Ventilators are an efficient, economical choice for general ventilation or mildly corrosive atmospheres. They should not be used in atmospheres where the corrosive concentration is enough to damage the motor. The design incorporates the Hartzell panel fan concept with a wind-band and butterfly dampers. The dampers open automatically when the fan goes on and close weathertight when the fan is shut down. During operation, the force of the discharge air effectively prevents entry of rain or snow.

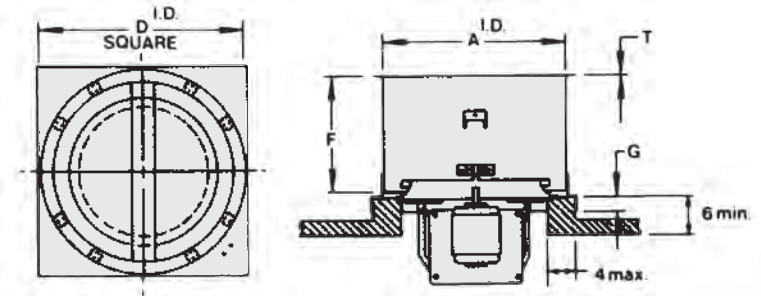
For performance data, please visit www.hartzellflow.com or contact your local sales representative.

Options & Accessories

Refer to pages listed below for details.

Features:

- **Sizes –** 28” to 60”
- **Performance –** 7,300 CFM to 51,000 CFM at free air
- **Temperature –** Suitable for temperatures up to 180°F (Specially insulated motors are required for temperatures above 104°F.)
- **FRP Construction –** Standard FRP components are constructed of fiberglass and vinylester resin. See Corrosion Resistance Guide on page 79 for resin characteristics. Other resins are available.
- **Motor Mount –** The mount is an expoxy coated, welded, steel rod assembly. Stainless steel is available as an option. Airstream hardware is stainless steel, coated with resin after assembly. The mount supports the motor below ventilator and offers minimum resistance to the airflow. The assembly bolts to the orifice panel.
- **Propellers –** Propellers are one-piece fiberglass construction and electronically balanced on unit at operating speed to ensure vibration-free operation.
  – Sizes 28” to 48” – 6-blade, Type-FW
  – Sizes 28” and 44” – Also available as 6-blade, Type-M
  – Sizes 54” and 60” – 2-blade, Type-M
- **Motors –** Motors are totally enclosed. Mill and chem are standard. Other motors are available upon request.
- **Orifice Panel –** Inlet orifice increases efficiency by minimizing air friction.
- **Windband –** Designed with the necessary height to effectively prevent wind resistance against the operation of the ventilator.
- **Dampers –** Two fiberglass semi-circular lids at the base of the windband are mounted on stainless steel rods which turn in synthetic bearings. Fiberglass lids are very durable and have a longer lid life than steel. Fiberglass also has insulation qualities, which results in less heat loss when the unit is idle during winter months. See CFM Limitations for Damper Lid Operation chart for damper lid limits.
- **Lifting Lugs –** Lifting lugs come standard to facilitate installation.



Principal Dimensions (in.) – Series 57

Size	28	32	36	40	44	48	54	60
A	33	37	45	49⅛	49⅛	55⅜	61¼	68
D	42	42	48	50	54	60	64¼	70¼
F	19½	23	25¼	29	30½	32½	36	41½
G	2¾	2¾	2¾	2¾	2¾	3¾	3¾	3¾
T	¼	¼	¼	¼	5/16	5/16	½	½

Note: Specifications are subject to change. Certified prints are available.

CFM Limitations for Damper Lid Operation

	Fan Size												
CFM	12	16	18	20	24	28	32	36	40	44	48	54	60
Minimum*	1195	2080	2615	3210	4586	6200	8065	10175	12525	15120	17960	22890	28180
Maximum**	2726	4750	6976	7335	10475	14175	18435	23250	28630	34560	41055	52315	64410

**Minimum CFM to open lids* ***Maximum CFM to prevent lid damage*

Series 37
Upblast, Belt Drive Roof Ventilator

The Series 37 Fiberglass, Upblast Roof Ventilator is a heavy-duty unit with the motor out of the airstream. It is best suited for applications where severe corrosive elements exist or where the versatility of belt drive is required. The unit's fiberglass duct fan and exterior-mounted motor makes it well-suited for fume exhaust.

Features:

- **Sizes –** 12" to 60"
- **Performance –** 1,195 to 64,410 CFM at free air
- **Temperature –** Suitable for temperatures up to 200°F
- **FRP Construction –** Standard FRP components are constructed of fiberglass and vinylester resin. See Corrosion Resistance guide on page 79 for resin characteristics. Other resins are available.
- **Corrosion-Duty Construction –** The sturdy, three piece unit (windband, throat and panel) is constructed of fiberglass. All airstream hardware is stainless steel. Belts, bearings, sheaves and shaft are enclosed and protected from the airstream. The drive compartment is located on the negative pressure (suction) side of the propeller, drawing in ambient air from outside the fan and over the belts and bearings; this ensures a contaminant-free compartment.
- **Motor –** The motor is exterior mounted out of the airstream. The propeller shaft rotates in two heavy-duty bearings mounted on fiberglass supports taped to the inner shell with "T" reinforcements. Open end protected motors are standard. Special motors are available upon request.
- **Propellers –** Single piece, solid fiberglass construction
  – Sizes 12" to 48" – 6-blade, Type-FW
  – Sizes 54" and 60" – 4 and 6 blade adjustable, Type AF
- **V-Belt Drives –** Oversized for long life and continuous duty. Variable pitch through 48" fan size. Oil, heat and static resistant type.
- **Bearings –** Bearings are deep-row radial ball or roller type, self-aligning, shielded and mechanically sealed in cast iron or malleable housings. Long inner race insures even load distribution, providing a high radial and thrust load capacity. Bearings are relubrical. Minimum 50,000 hours L-10 bearing life.
- **Lubrication Tubes –** Extend from the bearings through the belt tube to the exterior of the fan housing. Allows for ease of maintenance.
- **Stack Cap –** Butterfly dampers open when the unit is on and close weathertight when unit is off. The discharge airstream prevents entry of rain or snow during operation. Fiberglass dampers are mounted on corrosive-resistant rods which turn in long-life plastic bearings. The stack cap is designed with enough height to effectively prevent wind resistance against the operation of the ventilator.
- **Curb Panel –** Constructed of heavy-duty fiberglass, it provides a convenient method of curb mounting a roof ventilator.
- **Lifting Lugs –** Lifting lugs come standard to facilitate installation.

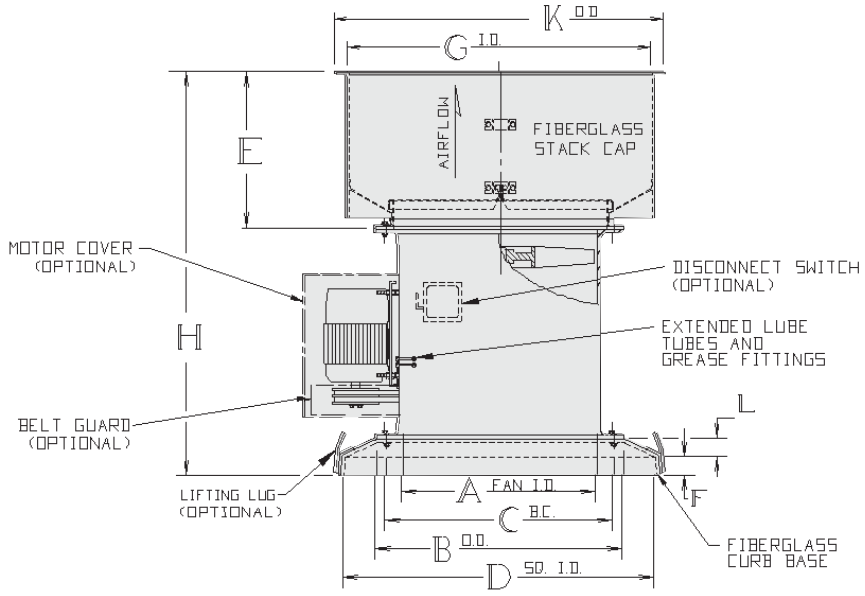
For performance data, please visit www.hartzellflow.com or contact your local sales representative.

Options & Accessories

Refer to pages listed below for details.

Hartzell Air Movement certifies that the Series 37, Fiberglass Belt Drive Upblast Roof Ventilator, shown herein, is licensed to bear the AMCA Seal for sound and air performance. Ratings 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. For performance and sound data, please visit www.hartzellflow.com or contact your local sales representative.

Series 37 Fiberglass Upblast Roof Ventilator



Principal Dimensions (inches) – Series 37

Fan Size	A	B	C	D	E	F	G	H	K	L
12	12⅞	16¼	14½	22	16¾	2	16⅞	40⅛	19⅜	1⅜
16	16⅞	20	18½	26	18¼	2	20⅞	42 1⁄16	23⅜	1 1⁄16
18	18⅞	22⅛	20½	28	20¾	2	24⅞	46⅛	27⅞	1⅜
20	20⅞	24⅛	22½	30	20¾	2	24⅞	49⅛	27⅞	1⅜
24	24⅞	28½	26⅝	36	18¼	2 3⁄16	28⅞	47¼	31⅞	1 13⁄16
28	28⅞	32⅜	30⅝	42	20¾	2 3⁄16	33	50⅛	36⅛	2 3⁄16
32	33	36½	34⅞	42	24¼	2⅛	37	55 13⁄16	40⅛	1 1⁄16
36	37	40⅝	38⅞	48	26½	2⅛	45	58 1⁄16	48⅛	1 13⁄16
40	41	44⅛	43⅛	50	30¼	2 1⁄16	49⅛	69⅞	53⅜	1⅝
44	45	48⅛	47⅛	54	31¾	2 1⁄16	49⅛	71⅛	53⅜	1⅝
48	49⅛	53⅜	51⅝	60	33¾	2⅝	55⅝	73 1⁄16	59⅝	1⅜
54	55⅝	59⅝	57⅝	64¼	37¼	2⅝	61¾	81⅛	65⅝	1 5⁄16
60	61⅜	65⅝	63⅜	70¼	42¾	2⅝	68	86⅝	72	1 5⁄16

Note: Specifications are subject to change. Certified prints are available.

Series 58E
Belt Drive, Hooded Roof Ventilator

The Series 58E Fiberglass Hooded Roof Ventilator provides complete protection from the elements. The unit's belt drive configuration and exterior-mounted motor, makes it a logical choice for an exhaust application where corrosive elements exist and protection from the weather is essential.

Features:

- **Sizes –** 12" to 60"
- **Performance –** 1,260 to 63,470 CFM at free air
- **Temperature –** Suitable for temperatures up to 200°F
- **FRP Construction –** Standard FRP components are constructed of fiberglass and vinylester resin. See the Corrosion Resistance Guide on page 79 for resin characteristics. Other resins are available.
- **Hood –** Fiberglass construction. A stationary, removable hood is standard. Optional hinged construction is available for access to the fan without removing the hood. Stationary and hinged hoods are one-piece construction up to size 32" and two-piece construction from sizes 36" to 60".
- **Curb Panel –** Constructed of heavy-duty fiberglass, it provides a convenient method of curb mounting a roof ventilator.
- **Motor –** The motor is exterior mounted out of the airstream. The propeller shaft rotates in two heavy-duty bearings mounted on fiberglass supports taped to the inner shell with "T" reinforcements. Open end protected motors are standard. Special motors are available upon request.
- **Corrosion-Duty Construction –** Belts, bearings, sheaves and shaft are enclosed and protected from the airstream. The drive compartment is located on the negative pressure (suction) side of the propeller drawing in ambient air from outside the fan and over the belts and bearings; this ensures a contaminant-free compartment.
- **Propellers –** Single piece, solid fiberglass construction.
  – Sizes 12" to 48" – 6-blade, Type FW
  – Sizes 54" and 60" – 6-blade adjustable, Type AF
- **V-Belt Drives –** Oversized for long life and continuous duty. Variable pitch through 48" fan size. Oil, heat and static resistant type.
- **Bearings –** Bearings are deep-row radial ball or roller type, self-aligning, shielded and mechanically sealed in cast iron or malleable housings. Long inner race insures even load distribution, providing a high radial and thrust load capacity. Bearings are relubrical. Minimum 50,000 hours L-10 bearing life.
- **Lubrication Tubes –** Extend from the bearings through the belt tube to the exterior of the fan housing. Allows for ease of maintenance.
- **Construction Options –** The Series 58E (Exhauster) can be supplied in Series 58I (Intake) configuration. Contact factory for additional information.
- **Lifting Lugs –** Lifting lugs come standard to facilitate installation.

For performance data, please visit www.hartzellflow.com or contact your local sales representative.

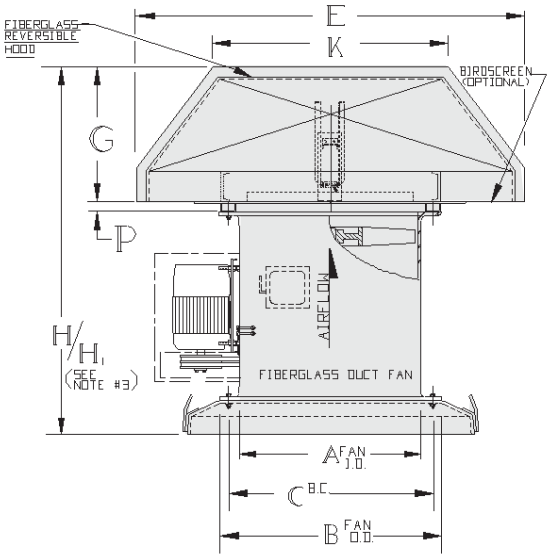
Options & Accessories

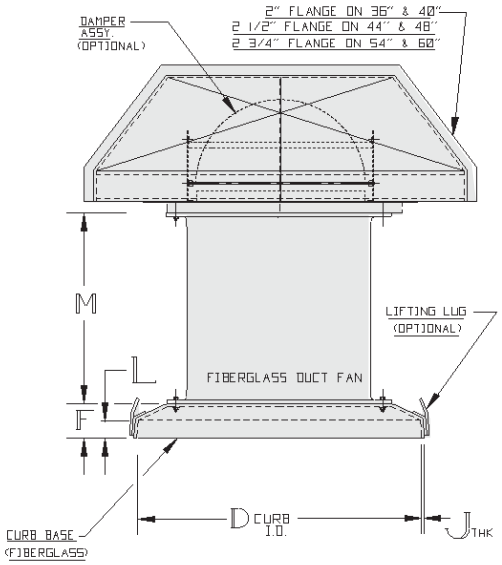
Refer to pages listed below for details.

MADE IN U.S.A.

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

Series 58E Fiberglass Hooded Roof Ventilator (foreground) and two Series 41P Fiberglass Centrifugal fans (background).





Principal Dimensions (inches) – Series 58

Fan Size	A	B	C	D	E	F	G	H	H_1	J	K	L	M	P
12	$12\frac{7}{8}$	$16\frac{1}{4}$	$14\frac{1}{2}$	22	$36\frac{3}{8}$	$3\frac{3}{8}$	$14\frac{15}{16}$	$38\frac{5}{16}$	$39\frac{13}{16}$	$\frac{5}{16}$	22	2	20	$1\frac{1}{2}$
18	$18\frac{7}{8}$	$22\frac{1}{8}$	$20\frac{1}{2}$	28	$36\frac{3}{8}$	$3\frac{3}{8}$	$14\frac{15}{16}$	$40\frac{5}{16}$	$41\frac{13}{16}$	$\frac{5}{16}$	22	2	22	$1\frac{1}{2}$
24	$24\frac{7}{8}$	$28\frac{1}{2}$	$26\frac{5}{8}$	36	$58\frac{1}{2}$	4	24	53	55	$\frac{7}{16}$	$34\frac{1}{2}$	$2\frac{3}{16}$	25	2
28	$28\frac{7}{8}$	$32\frac{3}{8}$	$30\frac{5}{8}$	42	$58\frac{1}{2}$	$4\frac{3}{8}$	24	$53\frac{3}{8}$	$55\frac{3}{8}$	$\frac{7}{16}$	$34\frac{1}{2}$	$2\frac{3}{16}$	25	2
32	33	$36\frac{1}{2}$	$34\frac{7}{8}$	42	$58\frac{1}{2}$	$3\frac{9}{16}$	24	$55\frac{9}{16}$	$57\frac{9}{16}$	$\frac{7}{16}$	$34\frac{1}{2}$	$2\frac{1}{8}$	28	2
36	37	$40\frac{5}{8}$	$38\frac{7}{8}$	48	$76\frac{1}{2}$	$3\frac{15}{16}$	$29\frac{3}{4}$	$61\frac{11}{16}$	$63\frac{11}{16}$	$\frac{7}{16}$	$53\frac{1}{16}$	$2\frac{1}{8}$	28	2
40	41	$44\frac{1}{8}$	$43\frac{1}{8}$	50	$76\frac{1}{2}$	$3\frac{5}{8}$	$29\frac{3}{4}$	$69\frac{3}{8}$	$71\frac{3}{8}$	$\frac{7}{16}$	$53\frac{1}{16}$	$2\frac{1}{16}$	36	2
44	45	$48\frac{1}{8}$	$47\frac{1}{8}$	54	$91\frac{1}{2}$	$3\frac{5}{8}$	$33\frac{3}{4}$	$73\frac{3}{8}$	$75\frac{3}{8}$	$\frac{7}{16}$	$62\frac{11}{16}$	$2\frac{1}{16}$	36	2
48	$49\frac{1}{8}$	$53\frac{3}{8}$	$51\frac{5}{8}$	60	$91\frac{1}{2}$	$3\frac{15}{16}$	$33\frac{3}{4}$	$73\frac{11}{16}$	$76\frac{3}{16}$	$\frac{7}{16}$	$62\frac{11}{16}$	$2\frac{9}{16}$	36	$2\frac{1}{2}$
54	$55\frac{3}{8}$	$59\frac{5}{8}$	$57\frac{5}{8}$	$64\frac{1}{4}$	113	$3\frac{7}{8}$	$39\frac{3}{4}$	$83\frac{5}{8}$	$86\frac{1}{8}$	$\frac{7}{16}$	77	$2\frac{9}{16}$	40	$2\frac{1}{2}$
60	$61\frac{3}{8}$	$65\frac{5}{8}$	$63\frac{5}{8}$	$70\frac{1}{4}$	113	$3\frac{7}{8}$	$39\frac{3}{4}$	$83\frac{5}{8}$	$86\frac{1}{8}$	$\frac{7}{16}$	77	$2\frac{9}{16}$	40	$2\frac{1}{2}$

Note: Specifications are subject to change. Certified prints are available.

Options and Accessories

Abrasive/Erosive Resistant Coating

HartKoate is an abrasive/erosive resistant coating developed by Hartzell Air Movement for application in environments where abrasive/erosive conditions may exist. HartKoate helps prevent premature deterioration of equipment in environments where uncoated fans may fail.

HartKoate is applied to a 50-60 mil thickness suitable for temperatures to 200°F.

HartKoate is particularly appropriate for use when water mist and/or abrasive particles exist in the airstream.

Contact your Hartzell representative for further details concerning the application of HartKoate coating to fiberglass fans in corrosive atmospheres.

Hi-Cor Construction

All airstream surfaces exposed to corrosive environment will be protected with a layer of Synthetic (Nexus) surfacing veil. An additional final coat of resin will be applied for extra corrosion resistance.

When Hi-Cor construction is required, the factory should be consulted concerning the corrosive environment involved.

Electrostatically Grounded

For applications in which fiberglass products are handling gas fumes that are not only corrosive but also potentially explosive, the equipment should be specially constructed to control and remove static electricity. Interior airstream surfaces can be coated with a “carbon rich” resin coat.

Grounding straps are secured from the side of the housing to the fan’s steel base. All that remains to effectively ground the airstream is to ground the fan base at the time of installation.

ASTM D4167-97 Construction

(ASTM D4167-97, Standard Specification for Fiber-Reinforced Plastic Fans and Blowers.) For corrosive systems where ASTM construction is specified this construction option adds: synthetic veil and electrostatically conductive surface coating applied to airstream housing and impeller surfaces, special nameplates, and special final dynamic balancing to fan.

Bird Screen

An epoxy coated steel spiral guard, located on top of ventilator discharge, to keep birds and other large debris from falling into the roof ventilator.

Safety Guard

Constructed of sixteen gauge, galvanized, epoxy coated, half inch wire mesh, the safety guard protects the floor area from falling debris and the ventilator from vandalism.

Prefabricated Curbs

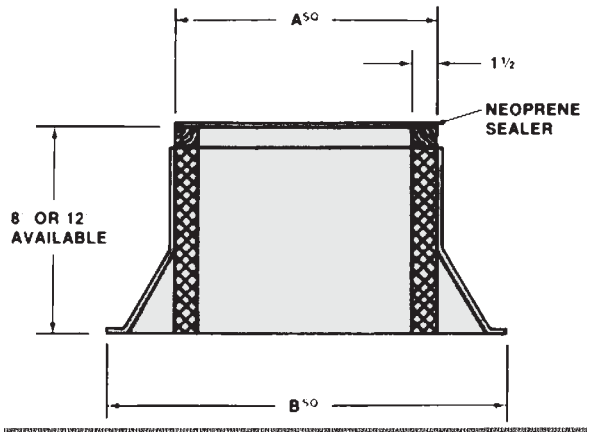
The CT-1 fiberglass prefabricated curb shown is for flat roof installation of Hartzell roof ventilators. The curb is designed for metal, concrete or wood roof decks that are not surface insulated. The curb is available either 8” or 12” high.

A Model IRC-1 prefabricated curb constructed of galvanized steel is also available with identical features as Model CT-1. Galvanized models can be furnished with epoxy coating. Aluminum construction also available.

All prefabricated curbs can be furnished for slope or peak bases. Prefabricated curbs are designed to support the weight of the fans cataloged herein, and attachments not exceeding over 100 additional pounds in a 40 mph wind. Nonstandard curb construction is available.

Features:

- Nailer Strip – strip facilitates fastening the ventilator to the curb.
- Glass Fiber Insulation - a rigid 1½” thick 3 lbs. density liner eliminates condensation problems.
- Neoprene Sealer – 1/4” strip.
- Construction: CT-1 - Isopthalic resin, no pigmentation
  IRC-1 - Galvanized steel (18 ga.)
  IRC-1 - Aluminum (.063 ga.)



Options and Accessories

Combination Motor Cover & Belt Guard

Constructed of epoxy coated, hot rolled steel. Provides weather protection and guards the drive sheaves and belts. The covers are vented. **Series 37 and 58E only.**

Fiberglass Motor Cover

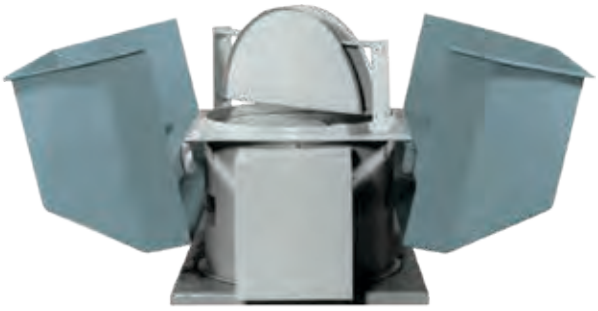
Designed to fit fiberglass roof ventilators. The cover is solid fiberglass and die-formed with injection molded louvers.

Disconnect Switch

Mounted and wired, provides safety during maintenance.

Hinged Hood

A stationary, removable, fiberglass hood is standard. Hinged construction is available for access to the fan without removing the hood. Stationary and hinged hoods are one-piece construction up to size 32" and two-piece construction from sizes 36" to 60". **Series 58E only.**



Backdraft Dampers

Backdraft dampers are available on hooded ventilators for exhaust operation only. The dampers are mounted in the hood. Two semi-circular lids open when the unit is on and close when the unit is off. When backdraft dampers are required, a hinged hood must also be used. See CFM Limitations for Damper Lid Operation chart for damper lid limits. **Series 58E only.**

CFM Limitations for Damper Lid Operation

	Fan Size												
CFM	12	16	18	20	24	28	32	36	40	44	48	54	60
Minimum*	1195	2080	2615	3210	4586	6200	8065	10175	12525	15120	17960	22890	28180
Maximum**	2726	4750	6976	7335	10475	14175	18435	23250	28630	34560	41055	52315	64410

**Minimum CFM to open lids* ***Maximum CFM to prevent lid damage*

The "Hartzell Experience" product trailer travels all over the U.S. and Canada exhibiting quality air moving products. Call your local sales representative to schedule a visit in your area today!

Hartzell

AIR MOVEMENT

Fiberglass Backward Curved Centrifugal Fans

SERIES 41

SERIES 41P

SERIES 41U

Fiberglass Backward Curved Centrifugal Fans

Hartzell Fiberglass Backward Curved Centrifugal Fans offer non-overloading horsepower characteristics, high efficiency, low noise and economy for corrosive atmospheres. These fans are unique in the fan and blower industry as they incorporate the proven, highly efficient, backward curved, airfoil-bladed, solid fiberglass, Type FA wheel in a solid fiberglass housing. The airfoil centrifugal wheel, centrifugal fan housing and inlet cone produce a compact, highly efficient unit with low noise characteristics.

Standard Construction Features

- **FRP Construction –** All structural parts in the airstream are fiberglass and resin. All fiberglass surfaces are protected with a minimum 10-mil thickness of chemical, flame, and ultraviolet resistant resin.

  – FRP Components & Housing – Constructed of fiberglass and corrosive resistant vinylester resin with a Class I flame spread rate of 25 or less.

  – Wheel – Constructed of fiberglass and Derakane 510-A corrosion resistant vinylester resin with a Class I flame spread rate of 25 or less.

  See the Corrosion Resistance Guide on page 79 for resin characteristics. Other resins are available.
- **Shafts –** Turned, ground, polished, and keyed at both ends with a fiberglass sleeve in the airstream. Shafts are sized to operate well below critical speed. 304 or 316 stainless steel or monel shafting is available as an option.
- **Hardware –** Internal hardware (airstream) is type 304 stainless steel and encapsulated. All external hardware (out of airstream) is zinc plated as standard. Where metal is subject to attack by the corrosive elements being handled, all metal parts can be resin-coated after assembly.
- **Shaft Seal –** A fiberglass and neoprene shaft seal is placed where the shaft leaves the bearing cover along with a neoprene shaft slinger between the seal and wheel on belt drive units. The seal is not gas tight.
- **Easy Installation and Maintenance –** Motor, drives and bearings are readily accessible for ease in wiring, installation, adjustment, and lubrication. Weather cover and guards are available.
- **Balancing –** The fan is electronically statically and dynamically balanced to the requirements of Fan Application Category BV-3 of AMCA/ANSI Std. 204. All fans receive an inspection prior to shipment and, whenever possible, a vibration test.
- **Spark Resistant Construction and Protective Coatings –** Spark resistant construction for fiberglass equipment is optional, and for abrasive environments or extremely corrosive environments, special construction is available.

Type FA Wheel

The Type FA wheel is unique in the fan and blower industry. It is manufactured as a single fiberglass piece using a multi-section RTM mold, ensuring that each wheel is aerodynamically identical and provides reliable, repeatable performance without the variability of hand-made and taped components. The superior design is a result of a substantial investment in research, development, tooling, and manufacturing methods by Hartzell Air Movement.

Features – Type FA wheels are highly efficient with a tapered inlet side and airfoil blades and have a non-overloading horsepower characteristic curve. When used in conjunction with a precision inlet cone it efficiently moves large volumes of air at high pressures with low noise characteristics at low RPM.

Construction – Solid fiberglass, die formed and constructed with Derakane 510-A corrosion resistant vinylester resin. The fiberglass resin has a Class I flame spread rate of 25 or less. Special constructions are available for abrasive or extremely corrosive environments.

Balancing – Each wheel is electronically, statically and dynamically balanced according to the requirements of Fan Application Category BV-3 of AMCA ANSI Std. 204-96. Each wheel is also operationally tested and inspected before shipment.

Hartzell Air Movement certifies that the Series 41, 41P and 41U, Fiberglass Backward Curved Centrifugal Fans, shown herein are licensed to bear the AMCA seal for sound and air performance. Ratings are based on tests and procedures performed in accordance with AMCA Publication 211 and Publication 311 and comply with the requirements of the AMCA Certified Ratings Program. For performance and sound data, please visit www.hartzellflow.com or contact your local sales representative.

Hartzell offers the only fiberglass wheel available in a solid, one-piece design from the mold.

- Solid, one-piece design from an RTM mold – up to 60” dia.
- Highly efficient with a tapered inlet side and airfoil blades
- Non-overloading horsepower characteristic curve
- Available in 12” - 60” diameters
- Available in clockwise and counter-clockwise rotation

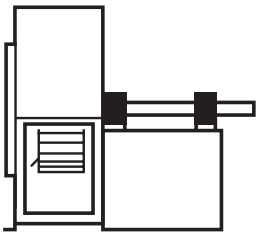
Centrifugal Fan Classifications

Series 41 and 41P Fiberglass Backward Curved Centrifugal Fans, Type FA, are designed and classified to perform within the centrifugal fan classification parameters established by AMCA Standard No. 2408; AMCA Publication 99. Hartzell Series 41 Fiberglass Backward Curved Centrifugal Fans, Type FA, 100% width are available in Class I and II construction. Hartzell Series 41 in 66% width are available in Class I, II, and III construction. Hartzell Series 41 in 33% width are available in Class II, III, and IV construction. Series 41P are available up through Class II construction only. See performance tables for specific ratings. These parameters are explained in the following table.

FAN CLASS	PERFORMANCE RANGE*		
	100% WIDTH	66% WIDTH	33% WIDTH
I	5" @ 2300 FPM to 2½" @ 3200 FPM	6" @ 1300 FPM to 2" @ 2700 FPM	
II	8½" @ 3000 FPM to 4¼" @ 4175 FPM	10" @ 2300 FPM to 2" @ 4000 FPM	14" @ 1400 FPM to 12" @ 1800 FPM
III		16" @ 2500 FPM to 4" @ 4000 FPM	22" @ 1500 FPM to 12" @ 3500 FPM
IV			30" @ 1700 FPM to 30" @ 3200 FPM

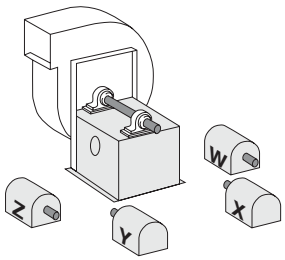
*** At standard air conditions (70°F, 29.92 in. HG barometric pressure, .075 lbs./ft.3). Static pressure shown in inches of water; outlet velocity shown in feet per minute. Performance Ranges apply only to 100% width construction.**

Centrifugal Fan Arrangements



Arrangement 1

Unit furnished with shaft and bearings, less motor and drive. Designed to be driven by a separately mounted motor. Impeller is overhung – two bearings on base.

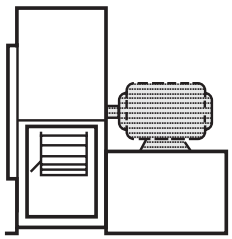


Motor Position Designation

Motor position designation is necessary when ordering the following for Arrangement 1 fans:

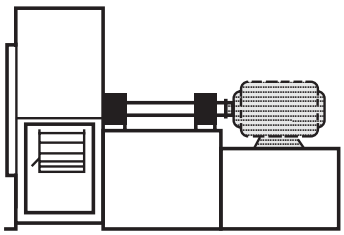
1 – V Belt Drive
2 – Vibration Bases
3 – Belt Guards

Note: Location of motor is determined by facing the drive side of the fan and designating the motor position by letters W, X, Y, or Z. Consider discharge location and height when specifying.



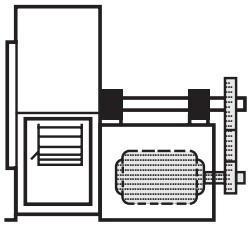
Arrangement 4

Direct drive packaged unit, wheel is overhung and attached to the shaft of the electric motor. No bearings on fan. Temperature limitations: 200°F.



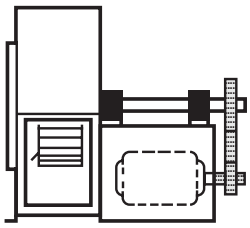
Arrangement 8

Direct coupled configuration with motor mounted to common fan base. Impeller is overhung and supported by two bearings on fan base.



Arrangement 9

Belt drive configuration with motor mounted on outside of bearing base support. Packaged unit, wheel is overhung, slide rail motor base permits easy adjustment of belt tension. Available on either left or right hand side of base (when facing drive end of shaft).



Arrangement 10

Belt drive configuration with motor mounted inside base. Packaged unit, wheel is overhung.

Adapted from AMCA Standard 99-2404-03, **Drive Arrangements for Centrifugal Fans**, and AMCA Standard 99-2407-03, **Motor Positions for Belt or Chain Drive Centrifugal Fans**, with written permission from Air Movement and Control Association International, Inc.

Type FA Wheel

For performance data, please visit www.hartzellflow.com or contact your local sales representative.

Options & Accessories

Refer to pages listed below for details.

Hartzell Air Movement certifies that the Series 41, Fiberglass Backward Curved Centrifugal Fan, Type FA, shown herein is licensed to bear the AMCA seal for sound and air performance. Ratings are based on tests and procedures performed in accordance with AMCA Publication 211 and Publication 311 and comply with the requirements of the AMCA Certified Ratings Program. For performance and sound data, please visit www.hartzellflow.com or contact your local sales representative.

Series 41

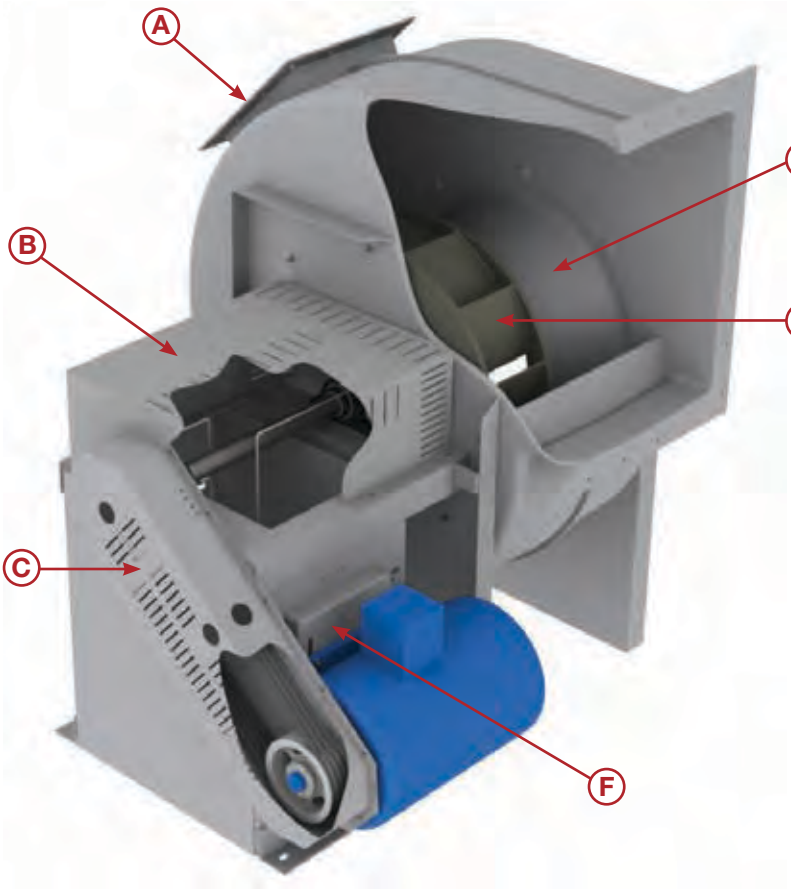
Backward Curved Centrifugal Fan, Belt or Direct Drive

The Series 41Fiberglass Backward Curved Centrifugal Fan offers non-overloading horsepower characteristics, high efficiency, low noise and economy for corrosive atmospheres. It is available in SWSI (single width single inlet) only.

Features

- **Sizes –** 12”– 60”
- **Classifications –** Available in classes I and II in 100% widths. Available in I, II, and III in 66% widths. Available in classes II, III and IV in 33% width.
- **Arrangements –** Available in belt drive arrangements 1, 9 and 10; direct drive arrangement 4; and direct coupled arrangement 8. Please contact the factory for arrangement 8 dimensions and other arrangements.
- **Applications –** Developed to perform in compatible corrosive environments where it is advantageous to have fiberglass materials and have the motor out of the airstream.
- **Performance –** Type FA fiberglass airfoil wheel with inlet cone and aerodynamically designed housing produces from 800 CFM to 100,000 CFM at pressures from free delivery to 30” W.G. at high efficiencies with non-overloading horsepower, low noise and low RPM.
- **Temperature Limitations –** Suitable for temperatures up to 250°F
- **Type FA Wheel –** High efficiency, solid fiberglass wheel built in one piece using a multi-section mold. This process insures repeatability and provides sealed, stronger joints. The tapered inlet side and airfoil design efficiently moves large volumes of air at high pressures. The wheel has non-overloading horsepower characteristic curve.
- **Rotation and Discharge Positions –** Available in both clockwise and counter-clockwise rotations in all standard discharge positions. Housing for 12” through 36” sizes are field rotatable.
- **Bearings –** Bearings are heavy-duty, self-aligning, ball or roller type, in cast iron pillow block housings, selected for minimum L-50 Life of 250,000 hours, and include extended lubrication fittings as standard.
- **Motor Out of Airstream –** The motor is exterior mounted on an adjustable motor slide base in belt drive models as standard. Motors can be furnished as TEFC, Mill and Chemical Duty or to other specifications on request. Motor HP and frame size limits are identified in the Dimensions and Material Specifications table.
- **V-Belt Drives –** Oversized for long life and continuous duty and fixed pitch as standard. Variable pitch drives are available upon request. Belts are oil, heat, and static resistant type.
- **Flanged Duct Connections –** Outlet flange is standard, inlet flange is optional. Flange bolt holes are optional.
- **Base –** Heavy gauge, welded, hot rolled steel with epoxy coating is standard.

Series 41 Sectional View



A. Access Door (Optional)
Raised, bolted door held in place with zinc plated bolts and gasketed for a tight seal. Allows for easy access to wheel compartment.

B. Shaft Guard (Optional)
Encloses the shaft/bearing assembly while permitting circulation of ambient air.

C. Drive Guard (Optional)
Encloses the drive assembly while permitting circulation of ambient air. Standard features include tach opening, belt tension openings and adjustable length to maximize air and sound performance.

D. Inlet Cone
Guides air smoothly into the wheel to maximize performance.

E. Type FA Wheel
Available in clockwise and counter-clockwise rotation.

F. Drive Tensioning Motor Base
Provides easy method to adjust belt tension for belt driven fans.

Series 41 Fiberglass Backward Curved Centrifugal Fan with Scrubber

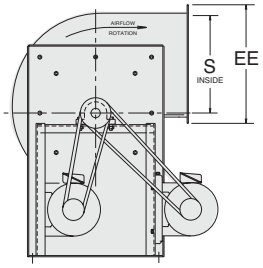
Series 41 Fiberglass Backward Curved Centrifugal Fan

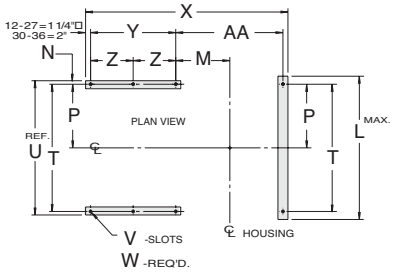
Series 41 Fiberglass Backward Curved Centrifugal Fan

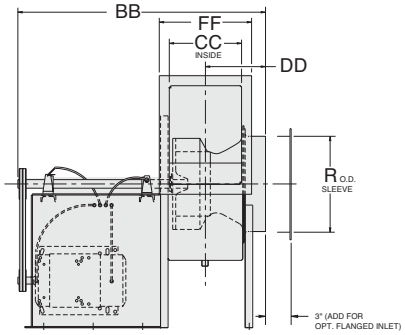
Series 41 Fiberglass Backward Curved Centrifugal Fan with Stack Caps

Dimensions – Arrangements 1, 9 or 10

Series 41, Type FA – Sizes 12” to 36” – Rotatable Housing
Standard Construction – Classes I, II, III and IV – Maximum Temperature: 250°F







Principal Dimensions (inches) – Series 41 – Sizes 12” – 36”

Fan Size	A	B Class I/II	B Class III/IV	C	D	E	F Class I/II	F Class III/IV	G	H	J	L Class I/II	L Class III/IV	M 100% Width	M 66% Width	M 33% Width	N
12	18½	15½	15½	13	11⅝	12⅜	20⅝₃₂	20⅝₃₂	10¹³⁄₁₆	10¹⁄₁₆	9⅜	18¾	18¾	7⅝₃₂	6²⁷⁄₃₂	N/A	1
15	21½	18¹⁹⁄₃₂	19⅝	16³⁄₁₆	15⅞	16¹¹⁄₁₆	24¹⁹⁄₃₂	25⅝₁₆	14¹⁵⁄₁₆	14	13¹⁄₁₆	21¾	20¾	8⅜	7¹¹⁄₁₆	N/A	1
18	24¼	21¹⁵⁄₁₆	22⅞	19	18⅞₁₆	19⁹⁄₁₆	28¹⁵⁄₁₆	29¹⁹⁄₃₂	17⁵⁄₁₆	16³⁄₁₆	15¹⁄₁₆	28¾	27¾	11³⁄₁₆	10⅜	N/A	¹⁵⁄₁₆
22	30	26⁷⁄₃₂	27³⁄₁₆	21⅛	22¹¹⁄₁₆	24¹⁄₁₆	33¹⁵⁄₃₂	34⅛	21⁵⁄₁₆	19¹⁵⁄₁₆	18⁹⁄₁₆	29⅛	28⅛	11⅛	10⅛	5⁵⁹⁄₆₄	1
24	33¹⁵⁄₁₆	28⁹⁄₃₂	29¼	23	24⅞₁₆	25¹⁵⁄₁₆	36¼	36¹⁵⁄₁₆	22¹⁵⁄₁₆	21⅞₁₆	19¹⁵⁄₁₆	31	30	11⅞	10¾	6¹³⁄₆₄	1
27	32⅝	32½	32½	24	27⅞₁₆	29⅛	39¹⁵⁄₁₆	39¹⁵⁄₁₆	25¹³⁄₁₆	24⅛	22⅞₁₆	33⅛	33⅛	13³⁄₁₆	11¹⁵⁄₁₆	6⁵³⁄₆₄	1
30	37	35	35	28¼	29⁹⁄₁₆	31⅜	44²³⁄₃₂	44²³⁄₃₂	27¾	25¹⁵⁄₁₆	24¹⁄₁₆	38⅜	38⅜	17	15⅝	10⁵⁄₆₄	2⅛
33	40	38³⁄₁₆	38³⁄₁₆	28¹¹⁄₁₆	33¼	35¼	47¼	47¼	31¼	29¼	27³⁄₁₆	38⅜	38⅜	18½	16⅝	10⁵⁷⁄₆₄	2⅛
36	42	41⁵⁄₁₆	41⁵⁄₁₆	31⁵⁄₁₆	35¹⁄₁₆	37¼	51⁵⁄₁₆	51⁵⁄₁₆	32⅞	30¹¹⁄₁₆	28½	42¾	42¾	19¼	17⅝	10¹⁵⁄₁₆	2⅛

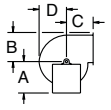
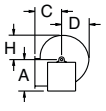
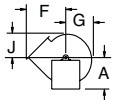
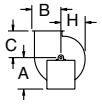
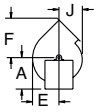
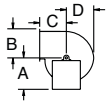
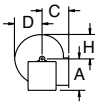
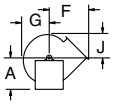
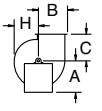
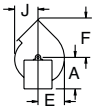
Fan Size	P	R	S	T	U	V	W	X 100% Width	X 66% Width	X 33% Width	Y	Z	AA 100% Width	AA 66% Width	AA 33% Width
12	8⅛	12¼	12⅞	16¼	18¼	¹¹⁄₁₆ x 1¹¹⁄₁₆	6	28⅛	26³¹⁄₃₂	N/A	12¾	- -	13¼	12⅝	N/A
15	9⅛	16½	16⅛	18¼	20¼	¹¹⁄₁₆ x 1¹¹⁄₁₆	6	34	32¾	N/A	15¾	- -	16	14⁹⁄₁₆	N/A
18	12¹¹⁄₁₆	19½	19⅜	25⅜	27¼	¹¹⁄₁₆ x 1¹¹⁄₁₆	8	41	39½	N/A	18¾	9⅜	20	18¼	N/A
22	12¹¹⁄₁₆	23⅞	23⅝	25⅜	27⅜	¹¹⁄₁₆ x 1¹¹⁄₁₆	8	44¹⁄₁₆	42	39²⁹⁄₃₂	20¼	10⅛	21⁹⁄₁₆	19½	17¹³⁄₃₂
24	12¹¹⁄₁₆	25⅞	25¾	25⅜	27⅜	¹¹⁄₁₆ x 1¹¹⁄₁₆	8	47⅞	46	43¹¹⁄₃₂	22½	11¼	23⅛	20⅞	18¹⁹⁄₃₂
27	11	28¾	29	22	24	¹¹⁄₁₆ x 1¹¹⁄₁₆	8	50⁹⁄₁₆	48³⁄₁₆	45¹⁵⁄₃₂	22½	11¼	25¹³⁄₁₆	23⁵⁄₁₆	20²³⁄₃₂
30	16⅞	31³⁄₁₆	31½	33¾	38	¹³⁄₁₆ x 1¼	8	57¹⁄₁₆	54⅜	51¹⁷⁄₃₂	22¾	11⅜	30¹³⁄₁₆	28⅛	25⁹⁄₃₂
33	16⅞	34³⁄₁₆	34¹¹⁄₁₆	33¾	38	¹³⁄₁₆ x 1¼	8	62⁷⁄₁₆	59⁷⁄₁₆	56¹¹⁄₃₂	25¾	12⅞	33³⁄₁₆	30³⁄₁₆	37³⁄₃₂
36	16⅞	37³⁄₁₆	37¹³⁄₁₆	33¾	38	¹³⁄₁₆ x 1¼	8	64¹¹⁄₁₆	61⁷⁄₁₆	58¹⁄₃₂	25¾	12⅞	35⁷⁄₁₆	32³⁄₁₆	28²⁵⁄₃₂

Fan Size	BB 100% Width	BB 66% Width	BB 33% Width	CC 100% Width	CC 66% Width	CC 33% Width	DD 100% Width	DD 66% Width	DD 33% Width	EE 100% Width Class I/II	EE 100% Width Class III/IV	EE 66% Width Class I/II	EE 66% Width Class III/IV	EE 33% Width Class I/II	EE 33% Width Class III/IV	FF 100% Width Class I/II	FF 100% Width Class III/IV	FF 66% Width Class I/II	FF 66% Width Class III/IV	FF 33% Width Class I/II	FF 33% Width Class III/IV
12	33⅛	31³¹⁄₃₂	N/A	9⁹⁄₃₂	8⅝	N/A	8	7⁷⁄₁₆	N/A	18⅛	18⅛	18⅛	18⅛	N/A	N/A	14⅜	14⅜	13½	13½	N/A	N/A
15	38¾	37³⁄₁₆	N/A	11¹¹⁄₁₆	10⁵⁄₁₆	N/A	9⁵⁄₁₆	8⁹⁄₁₆	N/A	21¹⁄₁₆	23⅛	21¹⁄₁₆	23⅛	N/A	N/A	16⅝	18¹¹⁄₁₆	15¼	17⁵⁄₁₆	N/A	N/A
18	45¾	47¹¹⁄₁₆	N/A	14	12⁵⁄₁₆	N/A	10½	9⅝	N/A	24½	26⅜	24½	26⅜	N/A	N/A	19¹⁄₁₆	21	17⅜	19⁵⁄₁₆	N/A	N/A
22	49⅝	47⁵⁄₁₆	45¹⁵⁄₃₂	17⅛	15¹⁄₁₆	12³¹⁄₃₂	12⅛	11	6⁵⁹⁄₆₄	28¾	30⅝	28¾	30⅝	28¾	30⅝	22¼	24⅛	20³⁄₁₆	22¹⁄₁₆	18³⁄₃₂	19³¹⁄₃₂
24	54⅛	51¹¹⁄₁₆	49¹⁹⁄₃₂	18⅝	16⅜	14³⁄₃₂	12¹⁵⁄₁₆	11¹¹⁄₁₆	7¹⁷⁄₆₄	30¹³⁄₁₆	32¾	30¹³⁄₁₆	32¾	30¹³⁄₁₆	32¾	23¹¹⁄₁₆	25⅝	21½	23⅜	19⁵⁄₃₂	21³⁄₃₂
27	56¾	53¹³⁄₁₆	51²¹⁄₃₂	21	18½	15²⁹⁄₃₂	14⅛	12⅞	7⁴⁹⁄₆₄	36	36	36	36	36	36	28	28	25½	25½	22²⁹⁄₃₂	22²⁹⁄₃₂
30	63¹⁄₁₆	60⅜	57¹⁷⁄₃₂	22¹³⁄₁₆	20¹⁄₁₆	17⁹⁄₃₂	15¹⁄₁₆	13¹¹⁄₁₆	8⁹⁄₆₄	38½	38½	38½	38½	38½	38½	29¹³⁄₁₆	29¹³⁄₁₆	27¹⁄₁₆	27¹⁄₁₆	24⁹⁄₃₂	24⁹⁄₃₂
33	69⅛	65⁷⁄₁₆	63¹⁄₃₂	25⅛	22⅛	19¹⁄₃₂	16¼	14¾	8⁴¹⁄₆₄	41¹¹⁄₁₆	41¹¹⁄₁₆	41¹¹⁄₁₆	41¹¹⁄₁₆	41¹¹⁄₁₆	41¹¹⁄₁₆	32⅛	32⅛	29⅛	29⅛	26¹⁄₃₂	26¹⁄₃₂
36	72¹¹⁄₁₆	69⁷⁄₁₆	66¹⁄₃₂	27⅜	24⅛	20²³⁄₃₂	17⅜	15¾	9¹⁄₁₆	44¹³⁄₁₆	44¹³⁄₁₆	44¹³⁄₁₆	44¹³⁄₁₆	44¹³⁄₁₆	44¹³⁄₁₆	34⅜	34⅜	31⅛	31⅛	27²³⁄₃₂	27²³⁄₃₂

Dimensions and specifications are subject to change. Clockwise Rotation is shown. Certified prints are available.

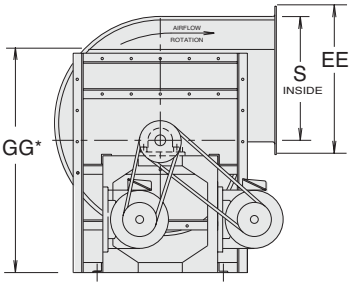
Fan Discharges

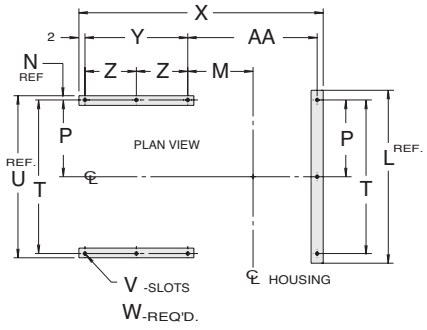
TAD, BAD and DB discharges require a discharge extension. Please contact the factory.

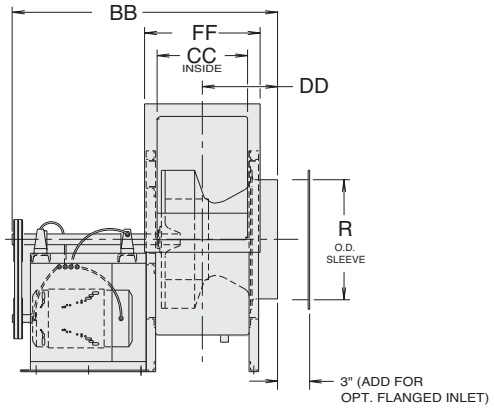
TOP HORIZONTAL		BOTTOM HORIZONTAL	BOTTOM ANGULAR UP	UP BLAST	TOP ANGULAR UP
CLOCKWISE					
	FOR TOP ANGULAR DOWN, BOTTOM ANGULAR DOWN AND DOWN BLAST, CONTACT FACTORY.				
COUNTERCLOCKWISE					
	FOR TOP ANGULAR DOWN, BOTTOM ANGULAR DOWN AND DOWN BLAST, CONTACT FACTORY.				

Dimensions – Arrangements 1, 9 or 10

Series 41, Type FA – Sizes 40” to 60” – Fixed Housing
Standard Construction – Classes I, II, III and IV – Maximum Temperature: 250°F







Principal Dimensions (inches) – Series 41 – Sizes 40” – 60”

Fan Size	A				B	C	D	E	F	G	H	J	L	M		
	TAU-TH	TAD	BH	BAU-UB										100% Width	66% Width	33% Width
40	47	47	47	47	46 13/16	35 5/16	40 1/4	42 3/4	58 1/16	37 3/4	35 1/4	32 3/4	55 1/4	21 3/16	19 3/8	11 59/64
44	51 1/4	51 1/4	51 1/4	51 1/4	52 3/8	39 11/16	45 1/2	48 1/4	65 1/8	42 3/4	40	37 3/16	59 5/8	22 7/8	20 7/8	12 39/64
49	56 1/2	56 1/2	56 1/2	56 1/2	57 1/8	43 11/16	49 1/16	52 1/8	71 5/16	46	42 15/16	39 7/8	71 1/2	24 9/16	22 3/8	13 17/64
54	54 1/4	47 3/4	64	61	62 7/8	48 3/8	54 3/8	57 3/4	78 11/16	51	47 9/16	44 1/4	69 5/8	27 3/8	24 15/16	14 7/8
60	60	52 1/2	70	67 1/2	69 1/16	53 1/2	59 7/8	63 3/4	86 11/16	56 1/8	52 3/8	48 5/8	75 1/2	29 5/8	26 15/16	15 51/64

Fan Size	N	P	R	S	T	U	V	W	X			Y	Z	AA		
									100% Width	66% Width	33% Width			100% Width	66% Width	33% Width
40	2	22	42 5/8	43 5/16	44	48	13/16 x 1 1/4	9	70 1/8	66 1/2	62 23/32	27 3/4	13 7/8	38 7/8	35 1/4	31 15/32
44	2	22	47 1/8	47 7/8	44	48	13/16 x 1 1/4	9	73 7/16	69 7/16	65 7/32	27 3/4	13 7/8	42 3/16	38 3/16	33 31/32
49	2 1/2	22 1/2	51 7/8	52 5/8	45	50	13/16 x 1 1/4	9	81 7/8	77 7/16	72 27/32	32 3/4	16 3/8	45 5/8	41 3/16	36 19/32
54	2	27	57 5/16	58 3/8	54	58	13/16 x 1 1/4	9	86 1/16	81 1/8	76 1/16	32	16	50 9/16	45 5/8	40 9/16
60	2	27	63 5/16	64 9/16	54	58	13/16 x 1 1/4	9	90 1/2	85 1/16	79 7/16	32	16	55	49 9/16	43 15/16

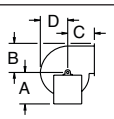
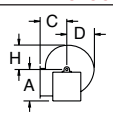
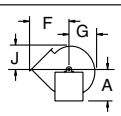
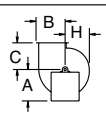
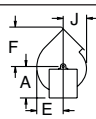
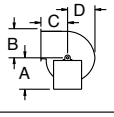
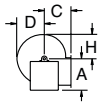
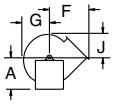
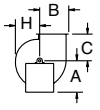
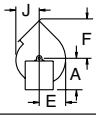
Fan Size	BB			CC			DD			EE	FF			GG*
	100% Width	66% Width	33% Width	100% Width	66% Width	33% Width	100% Width	66% Width	33% Width		100% Width	66% Width	33% Width	
40	78 13/16	75 3/16	71 13/16	31 3/8	27 3/4	23 31/32	19 1/2	17 11/16	10 15/64	50 5/16	38 3/8	34 3/4	30 31/32	- -
44	82 7/16	78 7/16	74 7/32	34 11/16	30 11/16	26 15/32	21 1/4	19 1/4	10 63/64	56 7/8	43 11/16	39 11/16	35 15/32	- -
49	90 7/8	86 7/16	81 27/32	38 1/8	33 11/16	29 3/32	22 15/16	20 3/4	11 41/64	61 5/8	47 1/8	42 11/16	38 3/32	- -
54	94 13/16	89 7/8	84 13/16	42 5/16	37 3/8	32 5/16	25	22 9/16	12 1/2	67 3/8	51 5/16	46 3/8	41 5/16	98 1/4
60	99 5/16	93 7/8	88 1/4	46 3/4	41 5/16	35 11/16	27 1/4	24 9/16	13 27/64	73 9/16	55 3/4	50 5/16	44 11/16	107 3/8

Dimensions and specifications are subject to change. Clockwise Rotation is shown. Certified prints are available.

Fan Discharges

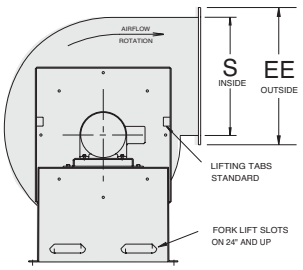
TAD, BAD and DB discharges require a discharge extension. Please contact the factory.

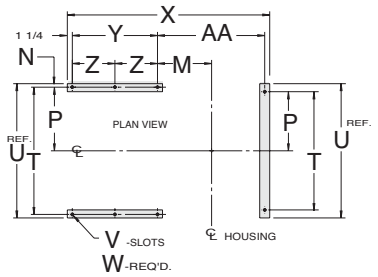
*For TAU discharges on 54” and 60” sizes only, the dimension is for the location of a removable split scroll to allow for shipping. Assembly is required in the field.

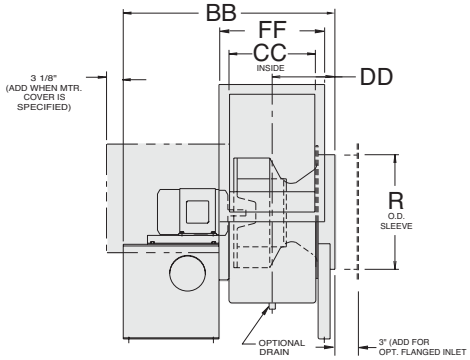
TOP HORIZONTAL		BOTTOM HORIZONTAL	BOTTOM ANGULAR UP	UP BLAST	TOP ANGULAR UP
CLOCKWISE					
	FOR TOP ANGULAR DOWN, BOTTOM ANGULAR DOWN AND DOWN BLAST, CONTACT FACTORY.				
COUNTERCLOCKWISE					
	FOR TOP ANGULAR DOWN, BOTTOM ANGULAR DOWN AND DOWN BLAST, CONTACT FACTORY.				

Dimensions – Arrangement 4

Series 41, Type FA – Sizes 12" to 33" – Rotatable Housing
Standard Construction – Classes I, II, III and IV – Maximum Temperature: 200°F







Principal Dimensions (inches) – Series 41 – Sizes 12" – 33"

Fan Size	A	B		C	D	E	F		G	H	J	M			N
		Class I/II	Class III/IV				Class I/II	Class III/IV				100% Width	66% Width	33% Width	
12	16	15½	15½	13	11⅝	12⅜	20 5/32	20 5/32	10 13/16	10 1/16	9⅜	8 7/16	7⅞	N/A	⅝
15	18¾	18 19/32	19⅝	16 3/16	15⅞	16 11/16	24 19/32	25 5/16	14 15/16	14	13 1/16	9 11/16	9	N/A	⅝
18	22	21 15/16	22⅞	19	18 7/16	19 9/16	28 15/16	29 19/32	17 5/16	16 3/16	15 1/16	10 15/16	10⅛	N/A	⅝
22	26¾	26 7/32	27 3/16	21⅛	22 11/16	24 1/16	33 15/32	34⅛	21 5/16	19 15/16	18 9/16	12⅞	11 9/16	7 43/64	⅝
24	28½	28 9/32	29¼	23	24 7/16	25 15/16	36¼	36 15/16	22 15/16	21 7/16	19 15/16	13⅜	12¼	7 45/64	⅞
27	32¼	32½	32½	24	27 7/16	29⅛	39 15/16	39 15/16	25 13/16	24⅛	22 7/16	14⅝	13⅜	8 17/64	⅞
30	34¾	35	35	28¼	29 9/16	31⅜	44 23/32	44 23/32	27¾	25 13/16	24 1/16	15 11/16	14 5/16	8 49/64	⅞
33	38	38 3/16	38 3/16	28 11/16	33¼	35¼	47¼	47¼	31¼	29¼	27 3/16	16 13/16	15 5/16	9 13/64	⅞

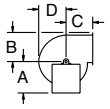
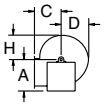
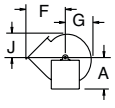
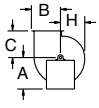
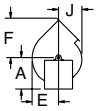
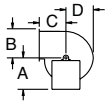
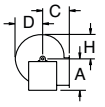
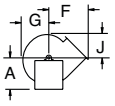
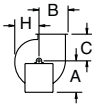
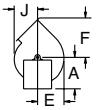
Fan Size	P	R	S	T	U	V	W	X			Y	Z	AA		
								100% Width	66% Width	33% Width			100% Width	66% Width	33% Width
12	9⅛	12¼	12⅞	18¼	19½	9/16 x 1 1/16	6	26 7/16	25 9/32	N/A	9½	- -	14 11/16	13 17/32	N/A
15	10¾	16½	16⅛	21½	22¾	9/16 x 1 1/16	6	36	34⅝	N/A	16½	- -	17¼	15 13/16	N/A
18	12⅜	19½	19⅜	24¾	27¾	9/16 x 1 1/16	6	40 5/16	39¼	N/A	19	- -	19 11/16	18	N/A
22	14½	23⅞	23⅝	29	30¼	9/16 x 1 1/16	6	44¼	42 3/16	40 3/32	19	- -	23	21	18 27/32
24	15⅞	25⅞	25¾	31¾	33½	11/16 x 1 3/16	6	45 13/16	43⅝	41 9/32	19	- -	24 9/16	22⅜	20 1/32
27	17⅝	28¾	29	35¼	37	11/16 x 1 3/16	6	48½	46	43 13/32	19	- -	27¼	24¾	22 5/32
30	18⅞	31 3/16	31½	37¾	39½	11/16 x 1 3/16	8	52 5/16	50¼	46 25/32	21½	10¾	29 3/16	26½	23 21/32
33	20⅝	34 3/16	34 11/16	41¼	43	11/16 x 1 3/16	8	57½	54 9/16	51 13/32	23¾	11⅞	31½	28 9/16	25 13/32

Fan Size	BB			CC			DD			EE						FF					
										100% Width		66% Width		33% Width		100% Width		66% Width		33% Width	
	100% Width	66% Width	33% Width	100% Width	66% Width	33% Width	100% Width	66% Width	33% Width	Class I/II	Class III/IV	Class I/II	Class III/IV	Class I/II	Class III/IV	Class I/II	Class III/IV	Class I/II	Class III/IV	Class I/II	Class III/IV
12	27 3/16	26 1/32	N/A	9 9/32	8⅝	N/A	8	7 7/16	N/A	18⅛	18⅛	18⅛	18⅛	N/A	N/A	14⅜	14⅜	13½	13½	N/A	N/A
15	36 11/16	35¼	N/A	11 11/16	10 5/16	N/A	9¼	8½	N/A	21 1/16	23⅛	21 1/16	23⅛	N/A	N/A	16⅝	18 11/16	15¼	17 5/16	N/A	N/A
18	41⅝	39¾	N/A	14	12 5/16	N/A	10 7/16	9⅜	N/A	24½	26⅜	24½	26⅜	N/A	N/A	19 1/16	21	17⅜	19 5/16	N/A	N/A
22	45⅛	42 13/16	40 31/32	17⅛	15 1/16	12 31/32	12	11	6 51/64	28¾	30⅝	28¾	30⅝	28¾	30⅝	22¼	24⅛	20 3/16	22 1/16	18 3/32	19 31/32
24	46 7/16	44 3/16	41 29/32	18⅝	16⅜	14 3/32	12 13/16	11 11/16	7 9/64	30 13/16	32¾	30 13/16	32¾	30 13/16	32¾	23 11/16	25⅝	21 7/16	21½	19 5/32	21 3/32
27	49	46½	43 29/32	21	18½	15 29/32	14⅛	12⅞	7 49/64	36	36	36	36	36	36	28	28	25½	25½	22 29/32	22 29/32
30	53½	50¾	47 31/32	22 13/16	20 1/16	17 9/32	15 1/16	13 11/16	8 9/64	38½	38½	38½	38½	38½	38½	29 13/16	29 13/16	27 1/16	27 1/16	24 9/32	24 9/32
33	58 1/16	52 13/16	51 31/32	25⅛	22⅛	19 1/32	16¼	14¾	8 41/64	41 11/16	41 11/16	41 11/16	41 11/16	41 11/16	41 11/16	32⅛	32⅛	29⅛	29⅛	26 1/32	26 1/32

Dimensions and specifications are subject to change. Clockwise rotation is shown. Certified prints are available.

Fan Discharges

TAD, BAD and DB discharges require a discharge extension. Please contact the factory.

TOP HORIZONTAL		BOTTOM HORIZONTAL	BOTTOM ANGULAR UP	UP BLAST	TOP ANGULAR UP
CLOCKWISE					
	FOR TOP ANGULAR DOWN, BOTTOM ANGULAR DOWN AND DOWN BLAST, CONTACT FACTORY.				
COUNTERCLOCKWISE					
	FOR TOP ANGULAR DOWN, BOTTOM ANGULAR DOWN AND DOWN BLAST, CONTACT FACTORY.				

Material Specifications/Weights – Series 41

Class	Fan Size	Flanges						Shaft & Bearings					FA Type Wheel WR² (lbs.-ft.²)	Motor Frames			Installation Weights (lbs. less motor)	
		Inlet		Outlet				100% & 66% Width		33% Width								
		Thickness	Holes	Thickness	Holes 100%	Holes 66%	Holes 33%	Shaft Size	Bearing Type	Shaft Size	Fixed Bearing Type	Expansion Bearing Type		Min. Arr. 4	Max. Arr. 4	Max. Arr. 9 & 10	Arr. 4	Arr. 9 & 10
I	12	1/8	7/16 x 8	1/4	7/16 x 10	7/16 x 10	—	1 3/16	P3U219H	—	—	—	1.6	56	184T	184T	160	193
	15	3/16	7/16 x 8	1/4	7/16 x 14	7/16 x 14	—	1 3/16	P3U219H	—	—	—	4.7	182T	256T	215T	235	230
	18	3/16	7/16 x 8	1/4	7/16 x 14	7/16 x 14	—	1 7/16	P3U223H	—	—	—	11	213T	286T	256T	350	355
	22	1/4	7/16 x 8	1/4	7/16 x 18	7/16 x 14	7/16 x 14	1 7/16	P3U223H	—	—	—	29	254T	286T	256T	490	490
	24	1/4	7/16 x 8	1/4	7/16 x 18	7/16 x 18	7/16 x 14	1 7/16	P3U223H	—	—	—	44	254T	286T	286T	580	605
	27	5/16	7/16 x 8	3/8	7/16 x 18	7/16 x 18	7/16 x 18	2 3/16	P3U235H	—	—	—	78	284T	286T	286T	660	770
	30	5/16	7/16 x 8	3/8	7/16 x 18	7/16 x 18	7/16 x 18	2 7/16	P3U239H	—	—	—	119	284T	326T	286T	935	975
	33	5/16	7/16 x 8	3/8	7/16 x 22	7/16 x 22	7/16 x 22	2 7/16	P3U239H	—	—	—	160	324T	365T	326T	1145	1185
	36	5/16	7/16 x 8	3/8	7/16 x 22	7/16 x 22	7/16 x 22	2 11/16	P243	—	—	—	251	—	—	326T	—	1550
	40	5/16	7/16 x 8	1/2	7/16 x 26	7/16 x 26	7/16 x 22	2 15/16	P247	—	—	—	423	—	—	365T	—	2015
	44	3/8	7/16 x 8	1/2	7/16 x 30	7/16 x 30	7/16 x 30	2 15/16	P247	—	—	—	717	—	—	365T	—	2515
	49	3/8	9/16 x 16	1/2	7/16 x 34	7/16 x 30	7/16 x 30	2 15/16	P247	—	—	—	1180	—	—	405T	—	2940
	54	7/16	9/16 x 16	1/2	7/16 x 34	7/16 x 30	7/16 x 30	2 15/16	PB22447H	—	—	—	1810	—	—	405T	—	3340
	60	7/16	9/16 x 16	1/2	7/16 x 38	7/16 x 38	7/16 x 38	2 15/16	PB22447H	—	—	—	2875	—	—	405T	—	3670
II	12	1/8	7/16 x 8	1/4	7/16 x 10	7/16 x 10	—	1 7/16	P3U223H	—	—	—	1.6	56	184T	184T	160	202
	15	3/16	7/16 x 8	1/4	7/16 x 14	7/16 x 14	—	1 7/16	P3U223H	—	—	—	4.7	182T	256T	215T	235	235
	18	3/16	7/16 x 8	1/4	7/16 x 14	7/16 x 14	—	1 11/16	P3U227H	—	—	—	11	213T	286T	256T	350	355
	22	1/4	7/16 x 8	1/4	7/16 x 18	7/16 x 14	7/16 x 14	1 11/16	PB22427H	1 11/16	B22400	U200	29	254T	286T	256T*	490	505
	24	1/4	7/16 x 8	1/4	7/16 x 18	7/16 x 18	7/16 x 14	1 11/16	PB22427H	1 11/16	B22400	U203	44	254T	286T	286T*	580	625
	27	5/16	9/16 x 8	3/8	7/16 x 18	7/16 x 18	7/16 x 18	2 3/16	PB22435H	2 3/16	B22400	U206	78	284T	286T	286T*	660	800
	30	5/16	9/16 x 8	3/8	7/16 x 18	7/16 x 18	7/16 x 18	2 7/16	PB22439H	2 7/16	B22400	U209	119	284T	326T	286T*	935	995
	33	5/16	9/16 x 8	3/8	9/16 x 22	9/16 x 22	9/16 x 22	2 7/16	PB22439H	2 7/16	B22400	U212	160	324T	365T	326T*	1145	1195
	36	5/16	9/16 x 8	3/8	9/16 x 22	9/16 x 22	9/16 x 22	2 11/16	PB22443H	2 11/16	B22400	U215	251	—	—	326T*	—	1620
	40	5/16	9/16 x 8	1/2	9/16 x 26	9/16 x 26	9/16 x 22	2 15/16	PB22447H	2 15/16	B22400	U218	423	—	—	365T*	—	2060
	44	3/8	9/16 x 8	1/2	9/16 x 30	9/16 x 30	9/16 x 30	2 15/16	PB22447H	2 15/16	B22400	U221	717	—	—	365T*	—	2560
	49	3/8	11/16 x 16	1/2	9/16 x 34	9/16 x 30	9/16 x 30	2 15/16	PB22447H	2 15/16	B22400	U224	1180	—	—	405T*	—	3040
	54	7/16	11/16 x 16	1/2	9/16 x 34	9/16 x 30	9/16 x 30	2 15/16	PB22447H	2 15/16	B22400	U227	1810	—	—	405T*	—	3480
	60	7/16	11/16 x 16	1/2	9/16 x 38	9/16 x 38	9/16 x 34	2 15/16	PB22447H	2 15/16	B22400	U230	2875	—	—	405T*	—	3670
III	12	1/8	9/16 x 8	1/4	9/16 x 10	9/16 x 10	—	1 11/16	P3U227H	—	—	—	1.6	56	184T	184T	160	213
	15	3/16	9/16 x 8	1/4	9/16 x 14	9/16 x 14	—	1 11/16	P3U227H	—	—	—	4.7	182T	256T	215T*	235	250
	18	3/16	9/16 x 8	1/4	9/16 x 14	9/16 x 14	—	1 15/16	P3U231H	—	—	—	11	213T	286T	256T*	350	375
	22	1/4	9/16 x 8	1/4	9/16 x 18	9/16 x 18	9/16 x 14	1 15/16	PB22431H	1 15/16	LB6800	U201	29	254T	286T	256T*	490	525
	24	1/4	9/16 x 8	1/4	9/16 x 18	9/16 x 18	9/16 x 14	1 15/16	PB22431H	2 3/16	LB6800	U204	44	254T	286T	286T*	580	635
	27	5/16	9/16 x 16	3/8	9/16 x 18	9/16 x 18	9/16 x 18	2 3/16	PB22435H	2 3/16	LB6800	U207	78	284T	286T	286T*	660	820
	30	5/16	9/16 x 16	3/8	9/16 x 18	9/16 x 18	9/16 x 18	2 7/16	PB22439H	2 7/16	LB6800	U210	119	284T	326T	286T*	935	1040
	33	5/16	9/16 x 16	3/8	9/16 x 22	9/16 x 22	9/16 x 22	2 7/16	PB22439H	2 11/16	LB6800	U213	160	324T	365T	326T*	1145	1210
	36	5/16	9/16 x 16	3/8	9/16 x 22	9/16 x 22	9/16 x 22	2 11/16	PB22443H	2 11/16	LB6800	U216	251	—	—	326T*	—	1630
	40	5/16	9/16 x 16	1/2	9/16 x 26	9/16 x 26	9/16 x 22	2 15/16	PB22447H	2 15/16	LB6800	U219	423	—	—	365T*	—	2080
	44	3/8	9/16 x 16	1/2	9/16 x 30	9/16 x 30	9/16 x 30	2 15/16	PB22447H	2 15/16	LB6800	U222	717	—	—	365T*	—	2580
	49	3/8	11/16 x 16	1/2	9/16 x 34	9/16 x 30	9/16 x 30	2 15/16	PB22447H	3 7/16	LB6800	U225	1180	—	—	405T*	—	3110
	54	7/16	11/16 x 16	1/2	11/16 x 34	11/16 x 30	11/16 x 30	2 15/16	PB22447H	3 7/16	LB6800	U228	1810	—	—	405T*	—	3500
	60	7/16	11/16 x 16	1/2	11/16 x 38	11/16 x 38	11/16 x 34	2 15/16	PB22447H	3 7/16	LB6800	U231	2875	—	—	405T*	—	3800
IV	22	Contact your local sales rep for material specifications/weights.						—	—	1 15/16	LB6800	U202	Contact your local sales rep for material specifications/weights.					
	24	Contact your local sales rep for material specifications/weights.						—	—	2 3/16	Seal Master MD	U205	Contact your local sales rep for material specifications/weights.					
	27	Contact your local sales rep for material specifications/weights.						—	—	2 3/16	LB6800	U208	Contact your local sales rep for material specifications/weights.					
	30	Contact your local sales rep for material specifications/weights.						—	—	2 7/16	LB6800	U211	Contact your local sales rep for material specifications/weights.					
	33	Contact your local sales rep for material specifications/weights.						—	—	2 11/16	LB6800	U214	Contact your local sales rep for material specifications/weights.					
	36	Contact your local sales rep for material specifications/weights.						—	—	2 11/16	LB6800	U217	Contact your local sales rep for material specifications/weights.					
	40	Contact your local sales rep for material specifications/weights.						—	—	2 15/16	LB6800	U220	Contact your local sales rep for material specifications/weights.					
	44	Contact your local sales rep for material specifications/weights.						—	—	2 15/16	LB6800	U223	Contact your local sales rep for material specifications/weights.					
	49	Contact your local sales rep for material specifications/weights.						—	—	3 7/16	LB6800	U226	Contact your local sales rep for material specifications/weights.					
	54	Contact your local sales rep for material specifications/weights.						—	—	3 7/16	LB6800	U229	Contact your local sales rep for material specifications/weights.					
	60	Contact your local sales rep for material specifications/weights.						—	—	3 7/16	LB6800	U232	Contact your local sales rep for material specifications/weights.					

* Motor frames exceeding these values must be Arrangement E, Arrangement 1, or Arrangement 8. For maximum motor frame size, other arrangements and dimensions, please contact the factory.

**Shown with optional accessories.*

Type FA Wheel

For performance data, please visit www.hartzellflow.com or contact your local sales representative.

Options & Accessories

Refer to pages listed below for details.

Hartzell Air Movement certifies that the Series 41P, Fiberglass Backward Curved Centrifugal Fan, Packaged, shown herein is licensed to bear the AMCA seal for sound and air performance. Ratings are based on tests and procedures performed in accordance with AMCA Publication 211 and Publication 311 and comply with the requirements of the AMCA Certified Ratings Program. For performance and sound data, please visit www.hartzellflow.com or contact your local sales representative.

Series 41P

Backward Curved Centrifugal Fan, Belt Drive, Packaged

The Series 41P Fiberglass Backward Curved Centrifugal Fan offers non-overloading horsepower characteristics, high efficiency, low noise, and economy for corrosive atmospheres in a compact packaged Class II design.

Features

- **Sizes –** 12" – 36"
- **Classification –** Class II construction
- **Arrangements –** Available in belt drive arrangement 10 with weather cover in both 100% and 66% widths. Sizes 22" - 36" are also available in 33% width.
- **Applications –** Developed to perform throughout the entire Class II performance range in compatible corrosive environments where it is advantageous to have fiberglass materials and have the motor out of the airstream.
- **Performance –** Type FA fiberglass airfoil wheel with inlet cone and aerodynamically designed housing produces from 800 CFM to 30,000 CFM at pressures from free delivery to 12" W.G. at high efficiencies with non-overloading horsepower, low noise, and low RPM.
- **Temperature Limitations –** Suitable for temperatures up to 250°F
- **Type FA Wheel –** High efficiency, solid fiberglass wheel built in one piece using a multi-section mold. This process insures repeatability and provides sealed, stronger joints. The tapered inlet side and airfoil design efficiently moves large volumes of air at high pressures. The wheel has non-overloading horsepower characteristic curve.
- **Rotation and Discharge Positions –** Available in clockwise and counter-clockwise rotations in all standard discharge positions. Rotatable housing.
- **Bearings –** Bearings are heavy-duty, self-aligning, ball or roller type, in cast iron pillow block housings, selected for long life at maximum Class II construction limits, and include extended lubrication fittings as standard.
- **Motor Out of Airstream –** The motor is interior mounted on an adjustable motor pivot base as standard. Motors can be furnished as TEFC, Mill and Chemical Duty or to other specifications on request. Motor HP and frame size limits are identified in the Dimensions and Material Specifications table.
- **V-Belt Drives –** Oversized for long life and continuous duty and fixed pitch as standard. Variable pitch drives for sizes 24" through 36" are available upon request. Belts are oil, heat, and static resistant type.
- **Flanged Duct Connections –** Outlet flange is standard, inlet flange is optional. Flange bolt holes are optional.
- **Base –** Heavy gauge, welded, hot rolled steel with epoxy coating is standard. Base is sized to accept maximum motor frame size required for Class II operation.

Series 41P Backward Curved Packaged Centrifugal Fan

Series 41P Backward Curved Packaged Centrifugal Fans

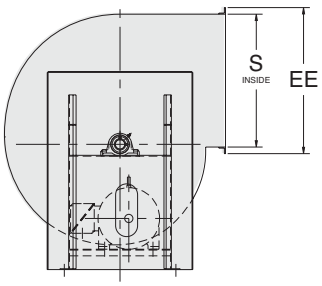
Material Specifications/Weights – Series 41P

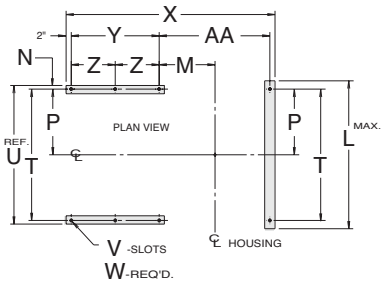
Class	Fan Size	Flanges				Shaft & Bearings			FA Type Wheel WR^2 (Lbs.-Ft.^{2})	Maximum Motor Frame Arr. #10	Installation Weights (Lbs. Less Motor)
		Inlet		Outlet							
		Thickness	Holes	Thickness	Holes 100% & 66%	Size	Drive Side	Inlet Side			
II	12	1/8	7/16 x 8	1/4	7/16 x 10	1 11/16	P3U-227	P3U-227	1.6	215T	188
	15	3/16	7/16 x 8	1/4	7/16 x 14	1 11/16	P3U-227	P3U-227	4.7	215T	215
	18	3/16	7/16 x 8	1/4	7/16 x 14	1 15/16	P3U-231	P3U-231	11	254T	309
	22	1/4	7/16 x 8	1/4	7/16 x 18	1 11/16	P3U-227	P3U-227	29	256T	397
	24	1/4	7/16 x 8	1/4	7/16 x 18	1 15/16	P3U-231	P3U-231	44	256T	554
	27	5/16	9/16 x 8	3/8	7/16 x 18	2 3/16	P3U-235	P3U-235	78	286T	728
	30	5/16	9/16 x 8	3/8	7/16 x 18	2 3/16	PB-22435	P3U-235	119	324T	878
	33	5/16	9/16 x 8	3/8	7/16 x 22	2 3/16	P3U-235	P3U-235	160	324T	1013
	36	5/16	9/16 x 8	3/8	7/16 x 22	2 3/16	P3U-235	P3U-235	251	326T	1131

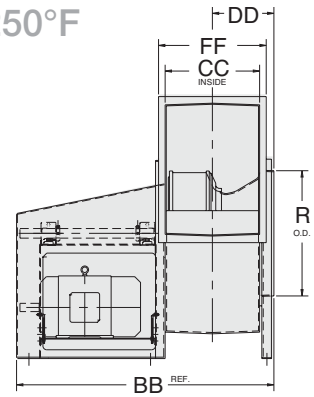
Be sure to log on to www.hartzellflow.com to generate your own fan curves and make thousands of fan selections! You can view 2D fan drawings and 3D models in seconds!

Dimensions – Arrangement 10

Series 41P, Type FA – Sizes 12” to 36” – Rotatable Housing
Standard Construction – Class II – Maximum Temperature: 250°F







Principal Dimensions (inches) – Series 41P – Sizes 12” – 36”

Fan Size	A	B	C	D	E	F	G	H	J	L	M 100% Width	M 66% Width	N
12	17	15½	13	11½	12⅜	20⅛	10⅞	10⅛	11 1/16	20¾	7 15/16	7⅝	⅝
15	17	18⅝	16 3/16	14½	15 7/16	24⅝	13 9/16	12⅝	13¼	20¾	9 3/16	8 7/16	⅝
18	20	21 15/16	19	17½	18⅝	28 15/16	16⅜	15¼	15¼	24¾	9 5/16	8½	⅝
22	24¾	26¼	21⅛	21 5/16	22 1/16	33½	19 15/16	18 9/16	17 3/16	29¾	10⅞	9⅞	⅝
24	27	28 5/16	23	23⅛	24⅝	36 5/16	21 1/16	20 3/16	18 1/16	31⅛	11⅝	10½	⅝
27	28½	32½	24	26	27 1/16	39 15/16	24 5/16	22⅝	20 15/16	34⅜	13 1/16	11 3/16	13/16
30	30½	35	28½	28¼	30 1/16	44 15/16	26⅜	24 9/16	22¾	37⅝	14	12⅝	13/16
33	37	38 3/16	28 1/16	31	33	47¼	29	27	24 15/16	41⅝	15⅛	13⅜	13/16

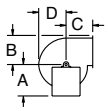
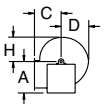
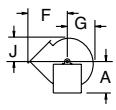
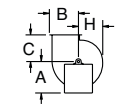
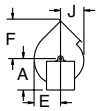
Fan Size	P	R	S	T	U	V	W	X 100% Width	X 66% Width	Y	Z	AA 100% Width	AA 66% Width
12	9¾	12¼	12⅞	19½	20¾	9/16 x 1	6	36 1/16	36	19⅝	- -	14 1/16	13⅜
15	9¾	16⅜	16⅛	19½	20¾	9/16 x 1	6	39 1/16	37⅝	19⅝	- -	16 7/16	15
18	10½	19⅜	19⅜	21	22¼	9/16 x 1	6	46⅛	44⅜	25¼	- -	17⅞	16⅛
22	11⅛	23¾	23 11/16	22¼	23½	9/16 x 1	6	49¼	47⅛	25¼	- -	21	18⅞
24	10½	25¾	25¾	21	22¼	9/16 x 1	6	50¾	48½	25¼	- -	22½	20¼
27	13 3/16	28⅝	29	26⅜	28	11/16 x 1½	8	58	55 7/16	29⅝	14 13/16	25⅜	22 13/16
30	13⅞	31 1/16	31½	27¾	29⅜	11/16 x 1½	8	63 3/16	60 7/16	33	16½	27 3/16	24 7/16
33	13⅞	34 1/16	34 11/16	27¾	29⅜	11/16 x 1½	8	65 9/16	62½	33	16½	29 9/16	26½

Fan Size	BB 100% Width	BB 66% Width	CC 100% Width	CC 66% Width	DD 100% Width	DD 66% Width	EE	FF 100% Width	FF 66% Width
12	37⅝	37	9 5/16	8 11/16	8⅛	7 13/16	18⅛	14⅜	13½
15	40⅛	38⅝	11 11/16	10 5/16	9 5/16	8½	21 1/16	16⅝	15¼
18	47 1/16	45⅜	14	12 5/16	10 9/16	9 11/16	24½	19 1/16	17⅜
22	50 3/16	48⅛	17⅛	15 1/16	12⅛	11 1/16	28¾	22¼	20 3/16
24	51¾	49½	18 1/16	16⅜	12 15/16	11¾	30 13/16	23 11/16	21½
27	59	56½	21	18½	14 5/16	13 1/16	36	28	25½
30	64 3/16	61½	22 13/16	20⅛	15¼	13⅞	38½	29 13/16	27⅛
33	66 9/16	63 9/16	25⅛	22⅛	16 7/16	14 15/16	41⅝	32⅛	29⅛
36	68 13/16	65 9/16	27 7/16	24⅛	17 9/16	15 15/16	44 13/16	34⅜	31⅛

Dimensions and specifications are subject to change. Clockwise Rotation is shown. Certified prints are available.

Fan Discharges

Scrolls are rotatable. BH and BAU discharges require a height adjusting sub-base. TAD, BAD and DB discharges require a discharge extension. Please contact the factory.

TOP HORIZONTAL		BOTTOM HORIZONTAL	BOTTOM ANGULAR UP	UP BLAST	TOP ANGULAR UP
CLOCKWISE					
	FOR TOP ANGULAR DOWN, BOTTOM ANGULAR DOWN AND DOWN BLAST, CONTACT FACTORY.				
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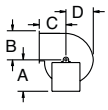
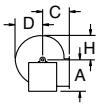
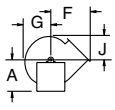
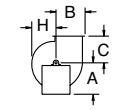
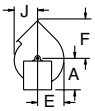
	FOR TOP ANGULAR DOWN, BOTTOM ANGULAR DOWN AND DOWN BLAST, CONTACT FACTORY.				

Series 41U

Backward Curved Centrifugal Fan, Belt Drive, Packaged, SWSI

The Series 41U Backward Curved Centrifugal Fan offers non-overloading horsepower characteristics, high efficiency, low noise and economy for most applications where corrosive elements exist in fume and vapor form. It is available in SWSI (single width single inlet) only.

Features

- **Sizes –** 12”, 18”, and 24”
- **Arrangement –** Available in belt drive arrangement 10, SWSI
- **Applications –** Developed to perform in compatible corrosive environments where it is advantageous to have fiberglass materials and have the motor out of the airstream.
- **Performance –** 700 CFM to 10,300 CFM at static pressures to 6” W.G.
- **Temperature Limitations –** Suitable for temperatures up to 200°F
- **Type FA Wheel –** High efficiency, solid fiberglass wheel built in one piece using a multi-section mold. This process insures repeatability and provides sealed, stronger joints. The tapered inlet side and airfoil design efficiently moves large volumes of air at high pressures. The wheel has non-overloading horsepower characteristic curve.
- **Rotation and Discharge –** Available in clockwise or counterclockwise rotation in all eight discharge positions. Rotatable housing.
- **Bearings –** Bearings on belt drive units are heavy duty, deep row radial ball, self-aligning and shielded in cast iron housings. Long inner races insure even load distribution, providing a high radial and thrust load capacity. Bearings are relubricable for continuous service with lubrication tubes extended to the exterior of fan base as necessary.
- **Motor Out of Airstream –** The motor is exterior mounted on an adjustable motor pivot base as standard. Motors can be furnished as TEFC, Mill and Chemical Duty or to other specifications on request.
- **V-Belt Drives –** Oversized for long life and continuous duty and fixed pitch as standard. Variable pitch drives are available upon request. Belts are oil, heat, and static resistant type.
- **Fan Inlets and Outlets –** Straight inlet and outlet connections are provided for easy “slip-fit” connection to ducting.
- **Base –** Heavy gauge, welded, hot rolled steel with epoxy coating is standard.

Type FA Wheel

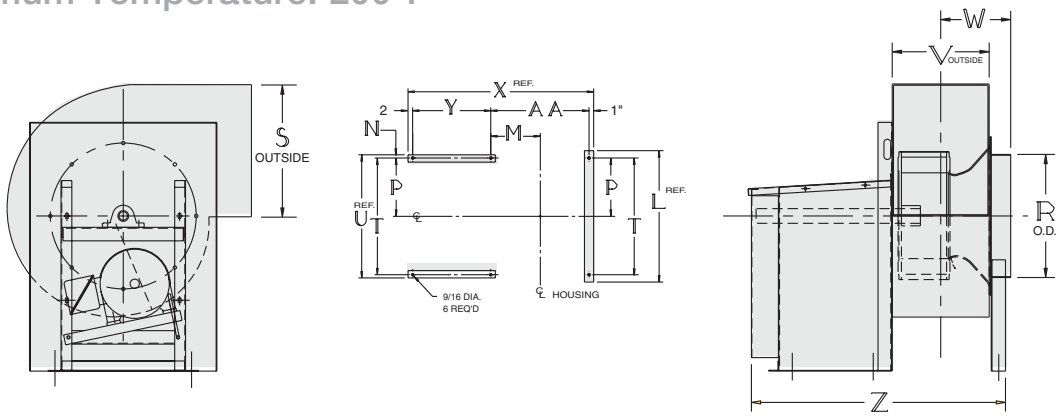
Options & Accessories

Refer to pages listed below for details.

Hartzell Air Movement certifies that the Series 41U, FRP Backward Curved Centrifugal Fan, Packaged, shown herein is licensed to bear the AMCA seal for sound and air performance. Ratings are based on tests and procedures performed in accordance with AMCA Publication 211 and Publication 311 and comply with the requirements of the AMCA Certified Ratings Program. For performance and sound data, please visit www.hartzellflow.com or contact your local sales representative.

Dimensions – Arrangement 10

Series 41U, Type FA – Sizes 12” to 24” – Rotatable Housing
Maximum Temperature: 200°F



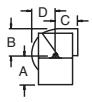
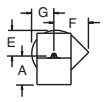
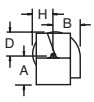
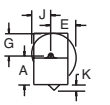
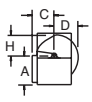
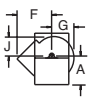
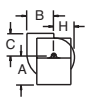
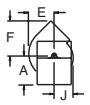
Principal Dimensions (inches) – Series 41U – Sizes 12” – 24”

Fan Size	A	B	C	D	E	F	G	H	J	K	L	M	N
12	18 11/16	13 1/8	13	11 1/2	12 1/4	18 1/2	10 3/4	10	9 1/4	5/16	21 1/2	7 7/16	3/4
18	23	19 3/4	19	17 1/4	18 7/16	27 7/16	16 5/16	15 1/16	13 15/16	4 1/4	27 3/4	9 7/8	1
24	29	26 1/8	23	22 15/16	24 7/16	34 3/4	21 1/2	20	18 1/2	5 5/8	30	12 3/16	1

Fan Size	P	R	S	T	U	V	W	X	Y	Z	AA	Max. Motor Frame
12	9 7/8	12 1/4	13 1/8	19 3/4	21 1/4	9 9/16	8	28 5/8	12	32 5/8	13 9/16	182T
18	10 1/8	18 1/4	19 11/16	20 1/4	22 1/4	14 3/8	10 3/8	33 5/8	12	37 5/8	18 1/2	184T
24	10 1/8	24 1/4	26 1/8	20 1/4	22 1/4	19	12 3/4	12 3/4	12	52 5/16	23 3/16	213T

Fan Discharges

For angular and/or down blast discharges, please contact the factory when discharge flanges are required.

TOP HORIZONTAL	TOP ANGULAR DOWN	DOWN BLAST	BOTTOM ANGULAR DOWN	BOTTOM HORIZONTAL	BOTTOM ANGULAR UP	UP BLAST	TOP ANGULAR UP
CLOCKWISE							
							
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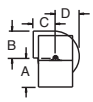
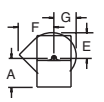
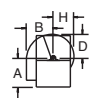
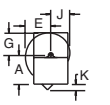
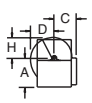
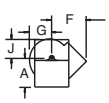
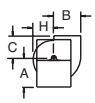
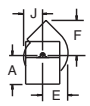
							

Call and speak to your local Hartzell Air Movement sales representative about one of our FRP centrifugal fans today!

Options and Accessories

Abrasive/Erosive Resistant Coating

HartKoate is an abrasive/erosive resistant coating developed by Hartzell Air Movement for application in environments where abrasive/erosive conditions may exist. HartKoate helps prevent premature deterioration of equipment in environments where uncoated fans may fail.

HartKoate is applied to a 50-60 mil thickness suitable for temperatures to 200°F.

HartKoate is particularly appropriate for use when water mist and/or abrasive particles exist in the airstream.

Contact your Hartzell representative for further details concerning the application of HartKoate coating to fiberglass fans in corrosive atmospheres.

Hi-Cor Construction

All airstream surfaces exposed to corrosive environment will be protected with a layer of Synthetic (Nexus) surfacing veil. An additional final coat of resin will be applied for extra corrosion resistance.

When Hi-Cor construction is required, the factory should be consulted concerning the corrosive environment involved.

Electrostatically Grounded

For applications in which fiberglass products are handling gas fumes that are not only corrosive but also potentially explosive, the equipment should be specially constructed to control and remove static electricity. Interior airstream surfaces can be coated with a "carbon rich" resin coat.

Grounding straps are secured from the side of the housing to the fan's steel base. All that remains to effectively ground the airstream is to ground the fan base at the time of installation.

Drain

For Series 41 & 41P:
Fiberglass bulk head fitting assembled in housing. 1" NPT female threaded fitting. Plug not provided.

For Series 41U:
Fiberglass half coupling assembled in housing. 1" NPT female threaded fitting.

Access Door

Raised, bolted door held in place with zinc plated bolts and gasketed for a tight seal.

Inspection Door

Allows for periodic visual inspection of the wheel. Constructed of fiberglass, fastened with stainless steel bolts and gasketed for tight seal.

Flanged Inlet

A fiberglass inlet flange is available. Flanges are drilled upon request. Note: A flanged and drilled inlet is required when an inlet control damper is used.

Flanged Outlet

Flanged outlets are standard on the Series 41 and 41P. A bolt-on flanged outlet is available for the Series 41U. Drill flanges are available on all series.

Disconnect Switch

An on/off switch mounted to the unit to provide safety during maintenance.

Inlet Box

Constructed of solid fiberglass, an inlet box improves entry conditions and minimizes losses, which are generally associated with duct elbows at the fan inlet. Inlet boxes are designed for specific applications. Please contact factory.

Vibration Isolators

Rubber-in-shear or spring type isolators are available.

Inlet and Outlet Guards

A spiral ring guard can be furnished for the inlet side and a wire mesh guard can be furnished for the outlet side. Series 41 and 41P guards are constructed of epoxy coated steel. Series 41U guards are constructed of alphacoat coated steel.

Additional Arrangements

Arrangement 8 and other arrangements (not shown in this catalog) are available. Please contact the factory.

Combination Drive Guard & Weather Cover

Constructed of epoxy coated steel. Covers motor and shaft sheaves as well as belts. Guards the drive and provides weather protection. Please specify fan arrangement.

Arrangement 9
Series 41

Arrangement 10
Series 41P & 41U

Options and Accessories

Inlet Control Damper

Dampers are mounted on the blower's drilled inlet flange to increase the efficiency of the system and permit control of air volume. Dampers are fiberglass, epoxy coated or stainless steel construction.

Outlet Control Damper

Dampers are mounted directly on the blower outlet to control the volume of air delivered to the system. Opposed and parallel blade dampers are available in steel, stainless steel, coated steel and solid fiberglass.

Parallel Blade Type

Best suited for applications requiring accurate air volume in a range from wide open to 75% open. Usually used for balancing the system or for modulated control when pressure drop is variable.

Parallel Blade

Opposed Blade Type

Best suited for control over a broad range of air volume with more precise control.

Opposed Blade

Both types of outlet control dampers are available in three classifications:

Class I – Maximum static pressure: 5" S.P.
Maximum velocity: 3,900 FPM

Class II – Maximum static pressure: 8½" S.P.
Maximum velocity: 5,100 FPM

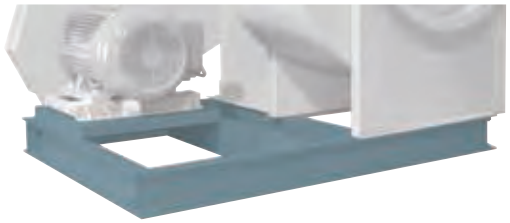
Class III – Maximum static pressure: 20" S.P.
Maximum velocity: 6,000 FPM

Discharge Backdraft Damper

Automatic gravity operated backdraft damper eliminates backflow of air when fan is not operating. **Series 41U only.**

Arrangement 1 Sub-Base

Common structural support for an Arrangement 1 fan and motor. Please specify motor mounting position. Epoxy coated steel construction. **Series 41 only.**



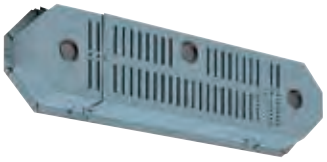
Arrangement E Motor Base

Accommodates a larger frame size motor than the standard arrangement 9 base. **Series 41 only.**

Drive Guards

Encloses the drive assembly while permitting circulation of ambient air. Standard features include: tach opening, belt tension openings and adjustable length. **Series 41 only.**

Shaft Guard
Arrangement 9 or 1



Belt Drive Guard
Arrangement 9

Hartzell

AIR MOVEMENT

Fiberglass In-Line Centrifugal Fans

SERIES 40

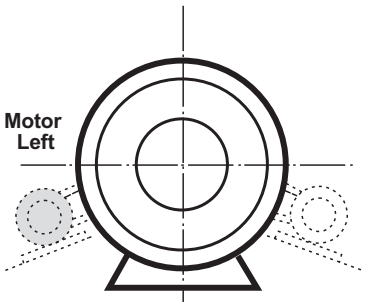
In-Line Centrifugal Fan Classifications

Hartzell Series 40 Fiberglass Backward Curved Centrifugal Fans, Type FA, are designed and classified with two classes of construction. Class I construction covers light to medium duty performance. Class II construction is required for maximum fan performance, but is inappropriate under light duty applications due to inadequate loading of the bearings.

Series 40 Fans are available in Class I and II construction in 100% width and 66% width. These parameters are explained in the following table.

FAN CLASS	PERFORMANCE RANGE
I	Light to Medium Duty
II	Maximum Fan Performance

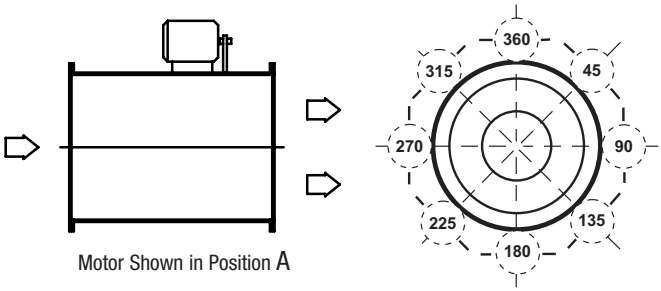
In-Line Centrifugal Fan Arrangements



View Facing Outlet

Arrangement 1

For belt drive. Impeller overhung on a shaft supported by bearing mounted with casing. Motor mounted independent of casing. Horizontal discharge.



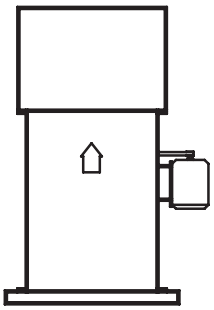
Motor Shown in Position A

View Facing Outlet

Arrangement 9

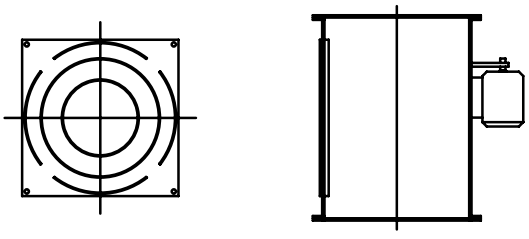
For belt drive. Impeller overhung on a shaft supported by bearings mounted with casing. Fan may be rotated to achieve motor positions. For horizontal and vertical discharge. Duct mounting shown.

Arrangement 9 can be furnished with supports for floor, wall or ceiling mounting. The position of these supports determines which motor locations are available for motor placement. Generally motor locations 135, 180 and 225 are not available on floor, wall or inverted ceiling mounted fans and motor locations 45, 90, 270 & 315 may not be available for ceiling hung fans.



Arrangement 9 – PRV

When desirable, the in-line centrifugal fan can be mounted as a power roof ventilator for exhaust application. Together with a stack cap and panel, the three elements combine to provide an efficient roof exhauster. Back draft dampers in the stack cap offer weatherproof closure for vertical air discharge.



Vertical Mounting

Another method for mounting vertical fans is shown in the view above. Specify fan to be furnished with ceiling mounting brackets, floor mounting brackets or both.

Specify either upblast or downblast discharge for vertically mounted fans.

Series 40

Fiberglass In-Line Centrifugal Fan, Belt Drive

The Series 40 In-Line Centrifugal Fan offers non-overloading horsepower, high efficiency, low noise, and economy for corrosive atmospheres. It is unique in the fan and blower industry. It combines the design advantages of the axial flow fan with the performance characteristics of the centrifugal fan. The design saves space by incorporating a tubular housing, as opposed to a traditional scroll-type centrifugal housing, and allows for the unit to be installed directly in a duct system. The "tubular centrifugal" or in-line fan utilizes the Type FA backward curved, airfoil-bladed wheel in a vane-equipped housing and produces straight airflow with the same inlet and discharge dimensions.

Features

- **Applications –** Developed for compatible corrosive applications where it is advantageous to have fiberglass materials and have the motor out of the airstream.
- **Performance –** Type FA fiberglass airfoil wheel with inlet cone and housing built in aerodynamically designed straightening vanes produces from 800 CFM to 94,000 CFM at pressures from free delivery to 12" W.G. at high efficiencies with non-overloading horsepower, low noise, and low RPM. Power Ratings (BHP) includes Belt Drive Losses.
- **Temperature –** Suitable for temperatures up to 200°F
- **Sizes –** 12" – 60"
- **Classifications –** Available in Class I and II in both 100% and 66% widths.
- **Arrangements –** Available in arrangements 9 and 1. Also available in a Power Roof Ventilator configuration.
- **FRP Construction –** All structural parts in the airstream are fiberglass and resin. All fiberglass surfaces are protected with a minimum 10-mil thickness of chemical, flame, and ultraviolet resistant resin.

  – FRP Components & Housing – Constructed of fiberglass and vinylester corrosive resistant vinyl resin with a Class I flame spread rate of 25 or less.

  – Wheel – Constructed of fiberglass and Derakane 510-A corrosion resistant vinylester resin with a Class I flame spread rate of 25 or less.

  See Corrosion Resistance Guide on page 79 for resin characteristics. Other resins are available.
- **Type FA Wheel –** High efficiency, solid fiberglass wheel built in one piece using a multi-section mold. This process insures repeatability and provides sealed, stronger joints. The tapered inlet side and airfoil design efficiently moves large volumes of air at high pressures. The wheel has non-overloading horsepower characteristic curve.
- **Shafts –** Shafts are 304 SS and are turned, ground, polished, and keyed at both ends with a fiberglass sleeve in the airstream. Shafts are sized to operate well below critical speed. 316 SS or monel shafting is available as an option at extra cost.
- **Bearings –** Bearings are heavy duty, deep row radial ball or double row spherical roller type self-aligning and shielded in cast iron housings. Long inner races insure even load distribution, providing a high radial and thrust load capacity. Bearings have a minimum L-50 life of 500,000 hours for horizontal fans and 250,000 hours for vertical fans. Bearings are relubricable for continuous service and include extended lubrication fittings as standard.
- **Shaft Seal –** A fiberglass and neoprene shaft seal is placed where the shaft leaves the housing along with a neoprene shaft slinger between the seal and wheel on belt drive units. The seal is not gas tight.

Features continued on next page…

Type FA Wheel

For performance data, please visit www.hartzellflow.com or contact your local sales representative.

Options & Accessories

Refer to pages listed below for details.

Hartzell Air Movement certifies that the Series 40, Fiberglass In-Line Centrifugal Fans, shown herein are licensed to bear the AMCA seal for sound and air performance. Ratings are based on tests and procedures performed in accordance with AMCA Publication 211 and Publication 311 and comply with the requirements of the AMCA Certified Ratings Program. For performance and sound data, please visit www.hartzellflow.com or contact your local sales representative.

Series 40 Fiberglass In-Line Centrifugal Fan

Series 40 Features (cont.)

- **Hardware –** Internal hardware (airstream) is encapsulated type 304 stainless steel. All external hardware (out of airstream) is zinc plated as standard. Where metal is subject to attack by the corrosive elements being handled, all metal parts can be resin-coated after assembly.
- **Motor –** The motor is exterior mounted out of the airstream on a fully adjustable platform-style motor base supported by an external housing assembly base. Open-end motors are standard. Motors larger than 30 HP will be shipped separately for mounting at the job site. Motor frame size limits are identified in the Principal Dimensions table.
- **V-Belt Drives –** Oversized for long life and continuous duty. Variable pitch drives are a standard option for 10 HP and below and fixed pitch are a standard option above 10 HP. Belts are oil, heat, and static resistant type.
- **Balancing –** The fan is dynamically balanced to the requirements of Fan Application Category BV-3 of AMCA/ANSI Std. 204-96. All fans receive vibration test and inspection prior to shipment.
- **Spark Resistant Construction –** Available as an option.
- **Protective Coatings –** Available as an option for abrasive or extremely corrosive environments.

Type FA Wheel

The Type FA wheel is unique in the fan and blower industry. It is manufactured as a single fiberglass piece using a multi-section RTM mold, ensuring that each wheel is aerodynamically identical and provides reliable, repeatable performance without the variability of hand-made and taped components. The superior design is a result of a substantial investment in research, development, tooling, and manufacturing methods by Hartzell Air Movement.

Features – Type FA wheels are highly efficient with a tapered inlet side and airfoil blades and have a non-overloading horsepower characteristic curve. When used in conjunction with a precision inlet cone it efficiently moves large volumes of air at high pressures with low noise characteristics at low RPM.

Construction – Solid fiberglass, die formed and constructed with Derakane 510-A corrosion resistant vinylester resin. The fiberglass resin has a Class I flame spread rate of 25 or less. Special constructions are available for abrasive or extremely corrosive environments.

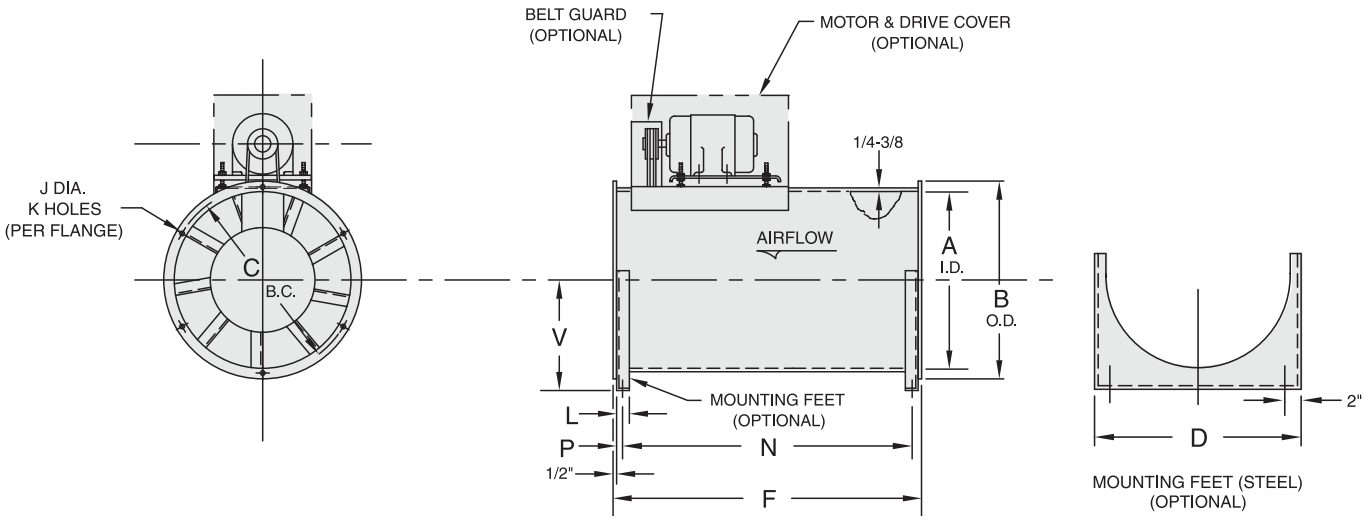
Balancing – Each wheel is electronically, statically and dynamically balanced according to the requirements of Fan Application Category BV-3 of AMCA ANSI Std. 204-96. Each wheel is also operationally tested and inspected before shipment.

Hartzell offers the only fiberglass wheel available in a solid, one-piece design from the mold.

- Solid, one-piece design from an RTM mold – up to 60” dia.
- Highly efficient with a tapered inlet side and airfoil blades
- Non-overloading horsepower characteristic curve
- Available in 12” - 60” diameters
- Available in clockwise and counter-clockwise rotation

Dimensions – Arrangement 9

Series 40, Type FA – Sizes 12” to 60”
Standard Construction – Classes I & II – Maximum Temperature: 200°F



Principal Dimensions (inches) – Series 40 – Sizes 12” – 60”

Size	A	B	C	F	J	K	L	N	P	Max Motor Frame
12	18 7/8	22 1/8	20 1/2	25	7/16	6	1 1/2	22 1/2	3/4	213T
15	20 7/8	24 1/8	22 1/2	35 3/4	7/16	6	1 1/2	33 1/4	3/4	215T
22	33	36 1/2	34 7/8	44 3/8	7/16	6	1 1/2	41 7/8	3/4	256T
27	37	40 1/8	38 7/8	48	7/16	6	1 1/2	45 1/2	3/4	286T
33	45	49 1/8	47 1/8	57	7/16	12	1 1/2	54 1/2	3/4	326T
40	54 7/8	59 5/8	57 5/8	64	7/16	12	2 1/2	60 1/2	1 1/4	365T
49	66 7/8	72 1/2	70 1/4	85 1/2	7/16	12	2 1/2	82	1 1/4	405T
60	81 7/8	88	85 3/4	103 5/8	7/16	12	2 1/2	100 1/8	1 1/4	405T

Mounting Feet (optional)

Size	D	V
12	22 1/2	12 5/8
15	24 1/2	14
22	36 5/8	20 1/8
27	44 3/4	24 1/8
33	48 3/4	26 1/8
40	60 1/8	31 7/8
49	75	37 1/2
60	90 1/2	47 1/16

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

Material Specifications/Weight

Series 40

Class	Fan Size	Fan Shaft	Drive Bearing	Wheel Bearing	100% Inertia	66% Inertia	Installation Weight 100%	Installation Weight 66%
I	12	1 3/16	P3-U219	P3-U219	1.6	1.4	93	93
	15	1 3/16	F3-U219	F3-U219	4.7	4.2	146	144
	22	2 3/16	F3-U235	F3-U235	29	25.1	312	307
	27	1 15/16	F3-U231	F3-U231	78.2	67.8	537	526
	33	2 3/16	F3-U235	F3-U235	160	140	672	657
	40	2 11/16	F3-U243	F3-U243	423	368	962	935
	49	2 15/16	F3-U247	F3-U247	1181	1033	1594	1545
	60	3 3/16	F-B22451	F-B22451	2877	2472	2399	2308
II	12	1 3/16	PE-B22419	P3-U219	1.6	1.4	96	96
	15	1 11/16	F3-U227	F3-U227	4.7	4.2	159	157
	22	1 11/16	F-B22427	F-B22427	29	25.1	302	297
	27	1 15/16	F-B22431	F-B22431	78.2	67.8	543	532
	33	2 3/16	F-B22435	F-B22435	160	140	683	668
	40	2 11/16	F-B22443	F-B22443	423	368	990	963
	49	2 15/16	F-B22447	F-B22447	1181	1033	1611	1563
	60	3 11/16	F-B22459	F-B22459	2877	2472	2507	2416

Dimensions and specifications are subject to change. Certified prints are available. Installation weight is approximate and is less motor, drives and optional equipment.

Options and Accessories

Abrasive/Erosive Resistant Coating

HartKoate is an abrasive/erosive resistant coating developed by Hartzell Air Movement for application in environments where abrasive/erosive conditions may exist. HartKoate helps prevent premature deterioration of equipment in environments where uncoated fans may fail.

HartKoate is applied to a 50-60 mil thickness suitable for temperatures to 200°F.

HartKoate is particularly appropriate for use when water mist and/or abrasive particles exist in the airstream.

Contact your Hartzell representative for further details concerning the application of HartKoate coating to fiberglass fans in corrosive atmospheres.

Hi-Cor Construction

All airstream surfaces exposed to corrosive environment will be protected with a layer of Synthetic (Nexus) surfacing veil. An additional final coat of resin will be applied for extra corrosion resistance.

When Hi-Cor construction is required, the factory should be consulted concerning the corrosive environment involved.

Electrostatically Grounded

For applications in which fiberglass products are handling gas fumes that are not only corrosive but also potentially explosive, the equipment should be specially constructed to control and remove static electricity. Interior airstream surfaces can be coated with a “carbon rich” resin coat.

Grounding straps are secured from the side of the housing to the fan’s steel base. All that remains to effectively ground the airstream is to ground the fan base at the time of installation.

ASTM D4167-97 Construction

(ASTM D4167-97, Standard Specification for Fiber-Reinforced Plastic Fans and Blowers.) For corrosive systems where ASTM construction is specified this construction option adds: synthetic veil and electrostatically conductive surface coating applied to airstream housing and impeller surfaces, special nameplates, and special final dynamic balancing to fan.

Companion Flanges

Drilled to fit the flanges of the fan; allows for easy installation. Fiberglass construction.

Drain

Fiberglass bulkhead fitting assembled in housing, NPT female threaded fitting. 1” NPT on Series 40. Plug not provided.

Inspection Door

Allows for periodic visual inspection of the wheel. Constructed of fiberglass, fastened with stainless steel bolts and gasketed for tight seal.

Fiberglass Motor Cover

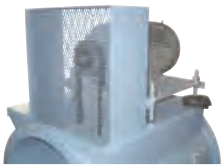
Designed to fit fiberglass in-line centrifugal fans. The cover is solid fiberglass and die-formed with injection molded louvers.

Weather Cover

Designed to fit belt drive in-line centrifugal fans. The cover is epoxy coated steel and vented. Specify horizontal or vertical mounting.

Belt Guard

Covers motor sheave and belts outside the fan housing. Epoxy coated, steel construction.



Combination Motor Cover & Belt Guard

Designed to fit fiberglass in-line centrifugal fans. Constructed of epoxy coated steel and vented. Specify horizontal or vertical mounting.

Series 40 Fiberglass In-Line Centrifugal Fan at a wastewater treatment plant.

Options and Accessories

Inlet and Outlet Guards

Constructed of epoxy coated steel.
OSHA approved.

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

Mounting Feet/Ceiling Suspension

Bolted to the inlet and discharge flanges, mounting feet allow for positioning of the duct fan on a floor, ceiling, wall or platform. Can be used with vibration isolators. Epoxy coated steel construction.

Vibration Isolators

Rubber-in-shear or spring type isolators are available. When using vibration isolators, mounting feet or a panel must be specified.

Inlet Control Damper

Dampers are mounted on the blower's drilled inlet flange to increase the efficiency of the system and permit control of air volume. are fiberglass, epoxy coated or stainless steel construction.

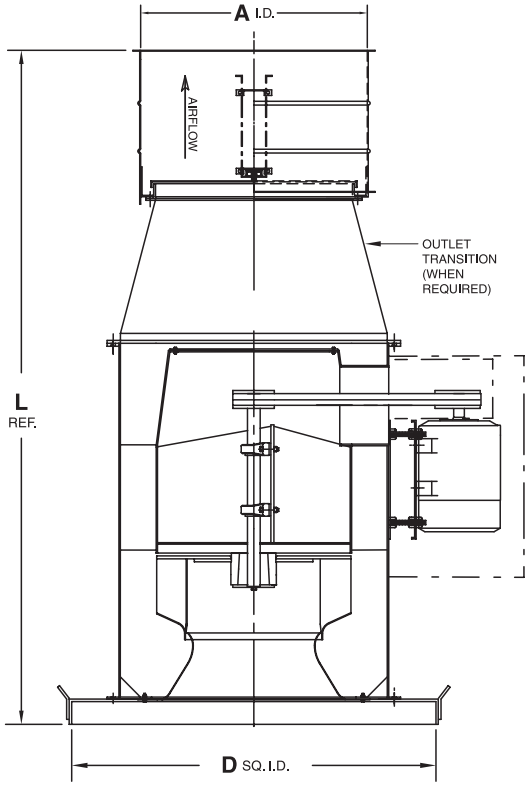
Roof Mounted Upblast

Together with a fiberglass curb panel and fiberglass stack cap, the Hartzell Fiberglass In-Line Centrifugal Fan can be mounted as a roof exhauster. The stack cap has back draft dampers to provide a weather tight closure for vertical air discharge.

Hooded Roof Ventilator

When required, the Hartzell Fiberglass In-Line Centrifugal Fan can be supplied with a fiberglass weather hood. These power roof ventilators can be used for intake or exhaust.

Power Roof Ventilator



CFM Limitations for Damper Lid Operation

Fan Size	Without Outlet Transition		With Outlet Transition	
	Minimum*	Maximum**	Minimum*	Maximum**
12	2,615	5,975	1,195	2,725
15	3,210	7,335	2,080	4,750
22	8,065	18,435	6,200	14,175
27	10,175	23,250	8,065	18,435
33	15,120	34,560	12,525	28,630
40	22,890	52,315	17,960	41,055
49	CF	CF	22,890	52,315
60	CF	CF	28,180	64,410

**Minimum CFM to open lids **Maximum CFM to prevent lid damage*
CF - Contact Factory for ratings.

Fan Size	D	Estimated Weight (lbs)	Without Outlet Transition		With Outlet Transition	
			A	L	A	L
12	26	200	24 7/8	47 3/4	16 7/8	55 3/4
15	28	274	24 7/8	58 1/2	20 7/8	66
22	40 1/2	553	37	71 1/8	33	77 5/8
27	44 1/2	713	45	77	37	91 3/4
33	52 3/4	1,163	49 1/2	91 3/4	49 1/8	102 1/4
40	63 1/2	1,650	61 3/4	142 1/2	55 3/8	112 3/4
49	75 3/4	2,403	- -	- -	61 3/4	140 3/4
60	91 1/2	3,351	- -	- -	68	167 3/8

Dimensions and specifications are subject to change. Certified prints are available. Installation weight is approximate and is less motor, drives and optional equipment.

Note: Guy wire bracing must be provided by customer when necessary.

Hartzell

AIR MOVEMENT

Fiberglass Axial Flow Fans

SERIES 28B
SERIES 28
SERIES 29B
SERIES 29
SERIES 34
SERIES 35
SERIES 35V

Fiberglass Axial Flow Fans

Standard Construction Features

• **FRP Construction –** All structural parts in the airstream are fiberglass and resin. All fiberglass surfaces are protected with a minimum 10-mil thickness of chemical, flame, and ultraviolet resistant resin. Corrosion resistant vinylester resin, having a class I flame spread rate of 25 or less is used for all housings and propellers.

• **Hardware –** All internal hardware (airstream) is Type 304 stainless steel and encapsulated. All external hardware (out of airstream) is zinc plated as standard. Where metal is subject to attack by the corrosive elements being handled, all metal parts can be resin-coated after assembly.

• **Propellers –** One piece construction, die formed of individual laminations of cloth mat plus woven roving. Adjustable pitch propellers incorporate die-formed blades.

For Belt Drive Units:

• **Fan shafts –** 304 stainless steel, turned, ground, polished, and keyed at both ends. Shafts are sized to operate well below critical speed. 316 stainless steel or monel shafting is available as an option at extra cost.

• **Shaft Seal –**A fiberglass and neoprene shaft seal is placed where the shaft leaves the bearing cover along with a neoprene shaft slinger between the seal and wheel on belt drive units.

• **Bearings –** Heavy duty, deep row radial ball or double row spherical roller type self-aligning and shielded in cast iron housings. Long inner races insure even load distribution, providing a high radial and thrust load capacity. Bearings are relubricable for continuous service with lubrication tubes extended to the exterior of fan base as necessary.

• **Bearing covers –** Sealed with foam gasket and bolted to the bearing base.

• **V-Belt Drives –** Oversized for long life and continuous duty. Fixed pitch or variable pitch drives are available upon request. Belts are oil, heat, and static resistant type.

Discharge Cones

Performance Data Charts for axial flow fans with inlet and outlet ducts of the same diameter as the fan can be found at www.hartzellflow.com. Discharge cones may be used on the duct fans to adapt to larger diameters (see Fig. A). The result is a static pressure regain.

Table 2 shows the amount of additional static pressure capability, which results from using the discharge cone. Add the amount of .45 (VP1–VP2) to the fan's static pressure.

$SP_2 = SP_1 + .45(VP_1 - VP_2)$

Thus, a fan selected for 4000 FPM O.V. at 3/4" SP using a size 18"-21" cone, the static pressure capability would be raised from .750" to .957" static pressure. Regain calculations are approximate and are not part of the AMCA certified ratings.

Discharge cones may also be used to transform large ducts to the fan 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 (see Table 2).

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

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	0.012	2750	0.099	4500	0.261
1250	0.020	3000	0.117	4750	0.290
1500	0.029	3250	0.138	5000	0.323
1750	0.040	3500	0.160	5250	0.356
2000	0.052	3750	0.183	5500	0.392
2250	0.065	4000	0.207	5750	0.428
2500	0.081	4250	0.233	6000	0.467

Note: For an included cone angle of 25°-30°.

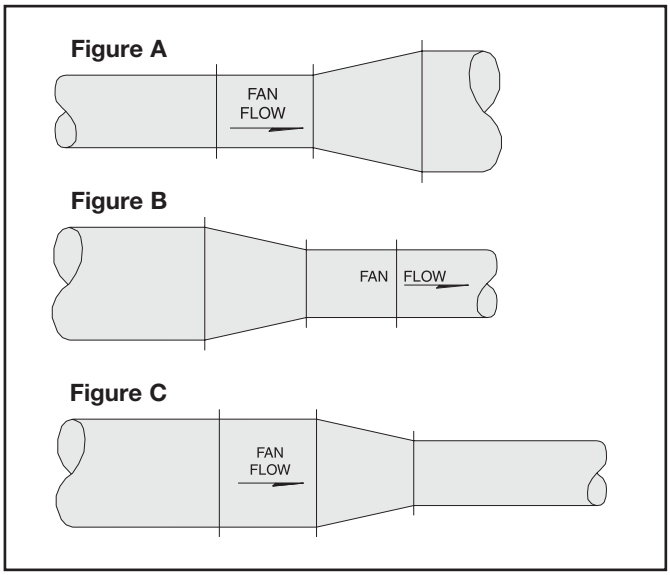


Table 2:
Corresponding Air Velocities for Various Pressures in Inches of Water (Air Weight = .07488 lbs. per cu. ft.)

F.P.M. VELOCITY	PRESSURE INCHES	F.P.M. VELOCITY	PRESSURE INCHES
500	0.0156	2250	0.316
600	0.0225	2500	0.391
700	0.0305	2750	0.473
800	0.0400	3000	0.562
900	0.0504	3250	0.661
1000	0.0625	3500	0.768
1100	0.0758	3750	0.880
1200	0.0900	4000	1.000
1300	0.1060	4250	1.130
1400	0.1220	4500	1.265
1500	0.1410	4750	1.410
1600	0.1600	5000	1.560
1700	0.1810	5250	1.720
1800	0.2030	5500	1.890
1900	0.2260	5750	2.060

Series 28B & 29B

Fiberglass Axial Flow Bifurcated Fans, Direct Drive

Series 28B
Type FW Low Pressure Propeller

Series 29B
Type E Medium Pressure Propeller

For performance data, please visit www.hartzellflow.com or contact your local sales representative.

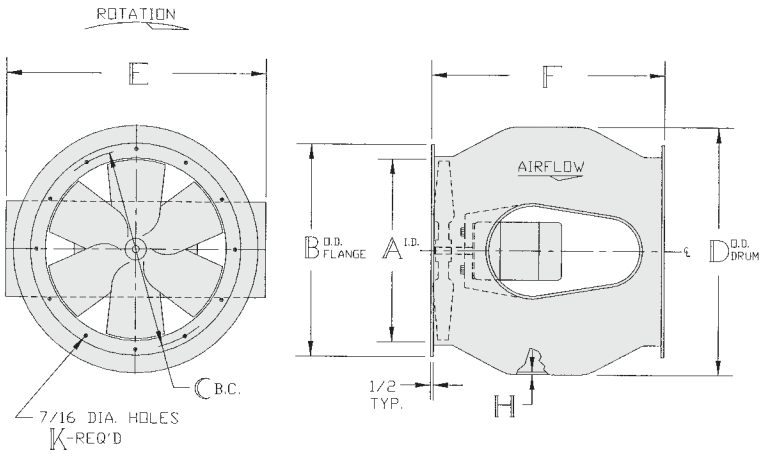
Options & Accessories

Refer to pages listed below for details.

Hartzell Series 28B and 29B Fiberglass Axial Flow Bifurcated Fans are designed and built to be used in a variety of corrosive applications. They can be installed in any position from vertical to horizontal and provide an excellent alternative to belt drive fans because the direct drive motor requires minimal periodic maintenance. Series 28B utilizes the Type FW propeller for low pressure applications and Series 29B utilizes the Type E propeller for medium pressure applications.

Features

- **Temperature –** Suitable for temperatures up to 200°F (Specially insulated motors are required for temperatures above 104°F.)
- **Sizes –** 24" – 48"
- **Performance –** 6,012 CFM to 46,145 CFM at free air
- **FRP Construction –** All structural parts in the airstream are fiberglass and corrosion resistant resin. All fiberglass surfaces are protected with a minimum 12 mil. thickness of a chemical, flame and ultraviolet resistant resin. Resin has a Class I flame spread rate of 25 or less. Taped joints inside casing are a minimum three layers, two-ounce material. Internal hardware is Austenitic Stainless Steel, encapsulated with a layer of fiberglass and resin.
- **Propellers –** One-piece construction, die formed of individual laminations of fiberglass, cloth mat, plus woven roving
  – Sizes 24" to 48" – 6-blade, Type FW, low pressure (Series 28B)
  – Sizes 24" to 48" – 6-blade, Type E, medium pressure (Series 29B)
- **Motor –** Extended shaft, C-face, TEFC motors are standard. Mill and chemical duty motors are available. Contact factory for availability of other motor enclosures.
- **Motor Mount –** C-face mounted, directly connected to prop with motor body enclosed in aerodynamic tube and protected from the airstream
- **Shaft Seal –** A neoprene, sandwich-type design seals the motor shaft at the inner tube.
- **Extended Lube Tubes –** An extended lubrication tube from the motor to the external duct surface of motor mounting tube is standard.



Principal Dimensions (inches) – Series 28B & 29B

Fan Size	A	B	C	D	E	F	H	K	Series 28B Weight Less Motor	Series 29B Weight Less Motor	Maximum Motor Frame
24	24⅞	28½	26⅝	33⅜	36	32	¼	6	114	115	182TC
28	28⅞	32⅜	30⅝	34½	36	33	¼	6	147	153	184TC
32	33	36½	34⅞	42½	44¾	43	¼	6	190	194	215TC
36	37	40⅝	38⅞	45½	47¾	45	¼	6	223	234	215TC
40	41	44¼	43⅜	51⅝	54	49	5⁄16	12	347	360	256TC
44	45	48⅛	47⅞	58⅝	60⅝	51	5⁄16	12	390	409	284TC
48	49⅛	53⅜	51⅝	61⅞	63⅜	58	5⁄16	12	439	476	286TC

Series 28 & 29

Fiberglass Duct & Duct Axial® Flow Fans, Direct Drive

Hartzell Series 28 and Series 29 Fiberglass Duct and Duct Axial® Flow Fans are engineered and built to be installed in duct systems for process ventilation applications in corrosive environments. The units can be used in any position, from vertical to horizontal.

Features

- **Temperature –** Suitable for temperatures up to 180°F (Specially insulated motors are required for temperatures above 104°F.)
- **Sizes –** 12" to 60"
- **Hardware –** Internal hardware is stainless steel as standard. Monel hardware is available at an extra cost.
- **Rigid Motor Mounts –** Fiberglass supports for foot mounted motors are designed for minimum resistance to airflow.
- **Extended Lube Tubes –** Extended tubes from motor to exterior of fan housing are standard. Extended motor leads to exterior of housing are available as an option.

SERIES 28 – DUCT FAN

- **Performance –** 1,325 CFM to 66,700 CFM
- **Propellers –** One-piece, solid fiberglass construction
  – Sizes 12" to 48" – 6 blade, Type FW
  – Sizes 54" and 60" – 2 blade, Type M
  – Sizes 54" and 60" – 4 blade*, Type M

  **Note: The 4-blade propeller is achieved by using (2) 2-blade propellers on a common shaft.*
- **Motor –** Totally enclosed XT motor is standard. Other motors, including standard totally enclosed are available on request.

SERIES 29 – DUCT AXIAL® FAN

- **Performance –** 1,204 to 68,950 CFM at free air
- **Propellers –** One-piece, solid fiberglass construction. The 6-blade, Type E, airfoil design with a higher hub-to-blade ratio moves large volumes of air at medium pressures.
- **Motor –** Totally enclosed mill and chemical motors are standard. Other motors, including standard totally enclosed are available on request.
- **Vane section –** The addition of the vane section to the discharge side of a duct axial fan makes it perform efficiently as a low-powered vaneaxial on the upper side of its pressure curve.

Series 28 Fiberglass Direct Drive Duct Fan in Caustic Soda Room at a Water Treatment Plant

Series 28

Hartzell Air Movement certifies that the Series 28, Fiberglass Direct Drive Duct Fan shown herein is licensed to bear the AMCA seal for sound and air performance. Ratings are based on tests and procedures performed in accordance with AMCA Standard 211 and comply with the requirements of the AMCA Certified Ratings Program. For performance and sound data, please visit www.hartzellflow.com or contact your local sales representative.

Series 29 (shown)
Series 29V (with vanes)

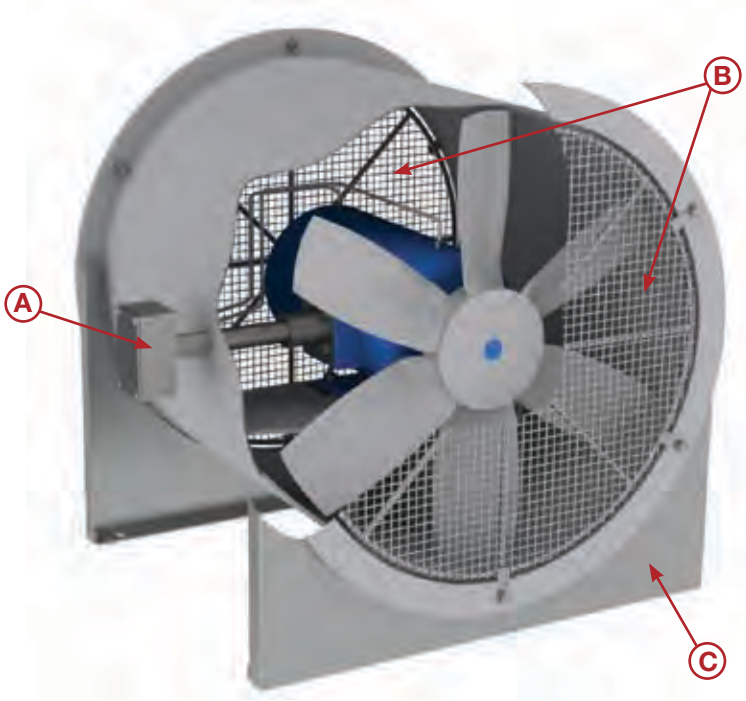
The AMCA Certified Ratings Seal does not apply to Series 29, Duct Axial® and 29V Duct Vaneaxial Fans.

For performance data, please visit www.hartzellflow.com or contact your local sales representative.

Options & Accessories

Refer to pages listed below for details.

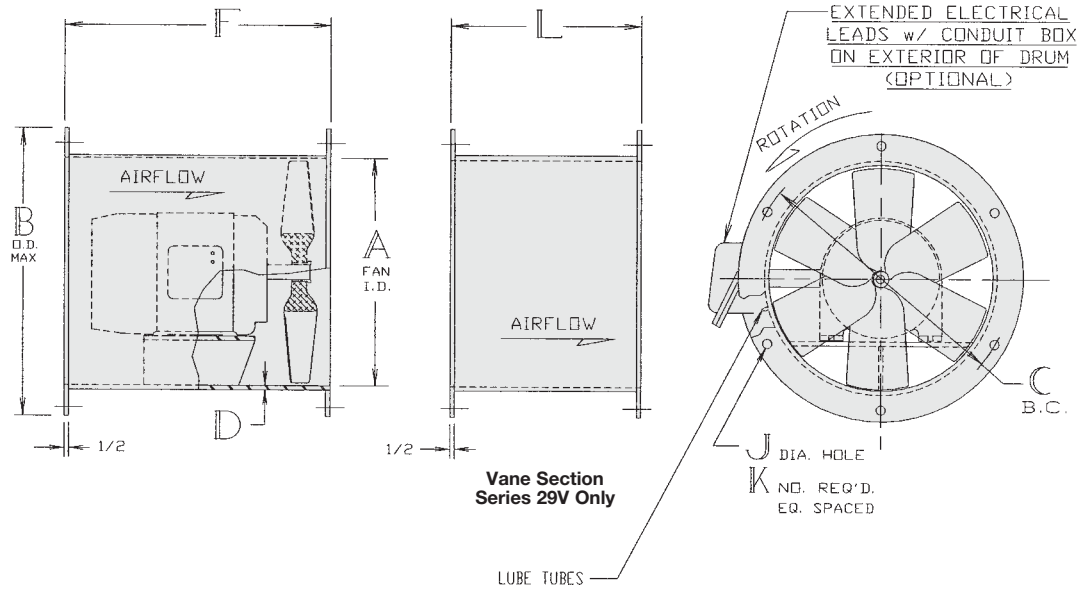
Series 28 Sectional View



A. Extended Motor Leads (Optional)
Extension to the exterior of housing allowing for easy access.

B. Inlet and Outlet Guards (Optional)
Epoxy coated steel guards available to protect the propeller.

C. Mounting Feet (Optional)
Bolted to the inlet and discharge flanges, mounting feet allow for positioning of the duct fan on a floor, ceiling, wall or platform. Can be used with vibration isolators. Epoxy coated steel construction.



Principal Dimensions (inches) – Series 28, 29, 29V

Fan Size	A	B	C	D	F	J	K	L	Max Motor Frame	*Max Fan Weight	Vane Section Weight
12	12⅞	16¼	14½	⅜	20	⅝	6	6	56	25	15
16	16⅞	20	18½	⅜	21	⅝	6	10	182T	30	20
18	18⅞	22⅛	20½	¼	22	⅝	6	11	182T	45	25
20	20⅞	24⅛	22½	¼	25	⅝	6	12	182T	60	30
24	24⅞	28½	26⅝	¼	25	⅞	6	13	182T	80	40
28	28⅞	32⅜	30⅝	¼	25	⅞	6	13	184T	100	50
32	33	36½	34⅞	¼	28	⅞	6	15	215T	125	65
36	37	40⅝	38⅞	¼	28	⅞	6	16	215T	150	80
40	41	44⅛	43⅜	⅝	36	⅞	12	--	256T	220	--
44	45	48⅛	47⅜	⅝	36	⅞	12	19	286T	270	105
48	49⅛	53⅜	51⅝	⅝	36	⅞	12	22	326T	335	135
54	55⅜	59⅝	57⅞	⅝	40	⅞	12	23	364T	410	160
60	61⅜	65⅝	63⅞	⅝	40	⅞	12	25	364T	480	190

*Weight without motor and accessories.

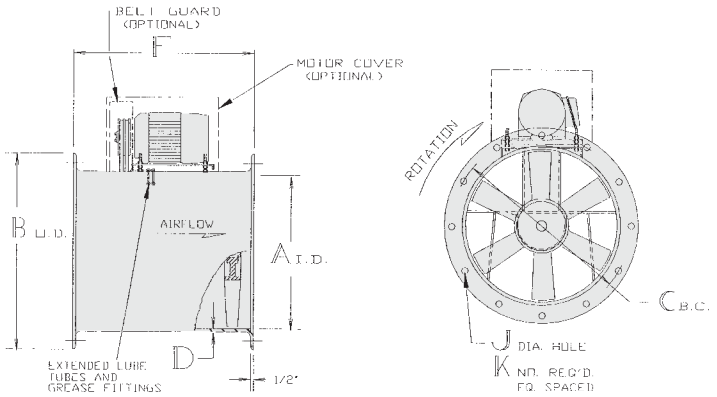
Series 34

Fiberglass Duct Fan, Belt Drive

Series 34 Fiberglass Duct Fans are engineered for installation in duct systems for process ventilation applications where the nature of the corrosive airstream warrants isolation of the motor and drive assembly from the airstream. They are best suited for applications with low static pressure characteristics from free air to 1" static pressure.

Features

- **Sizes –** 12" to 60"
- **Performance –** 1,021 CFM at 1/4" to 43,000 CFM at 1" S.P.
- **Motor –** Motors are exterior mounted out of the airstream. The propeller shaft rotates in two heavy-duty bearings mounted on fiberglass supports taped to the inner shell with "T" reinforcements. Open end protected motors are standard. Special motors are available upon request.
- **Corrosion-Duty Construction –** Belts, bearings, sheaves and shaft are enclosed and protected from the airstream. The drive compartment is located on the negative pressure (suction) side of the propeller drawing ambient air in from outside the fan and over the belts and bearings. This ensures a contaminate-free drive compartment.
- **Propellers –** One piece, solid fiberglass construction
  – Sizes 12" to 48" – 6-blade, Type FW
  – Sizes 54" and 60" – 6-blade adjustable, Type AF
- **Shaft –** Stainless steel with a neoprene slinger, neoprene seal and fiberglass cover plate. Keyed at both ends. Monel shafts available on request.
- **Bearings –** Heavy-duty, self-aligning, deep-row, radial-ball type shielded and mechanically sealed in cast iron or malleable housing. Bearings are relubricable for continuous service. Minimum 50,000 hrs. L-10 bearing life.
- **V-Belt Drives –** Over-sized for long life and continuous duty. Variable pitch drives are standard on units up to and including 10 HP. Variable pitch drives can be furnished on higher horse-power units upon request. Belts are oil, heat and static-resistant type.
- **Extended Lube Tubes –** Extend from bearings to exterior of fan housing.
- **Hardware –** Internal bolts are stainless steel and resin coated after assembly. Monel bolts are optional.



For performance data, please visit www.hartzellflow.com or contact your local sales representative.

Options & Accessories

Refer to pages listed below for details.

Hartzell Air Movement certifies that the Series 34, Fiberglass Belt Drive Duct Fan, shown herein is licensed to bear the AMCA seal for air performance. Ratings are based on tests and procedures performed in accordance with AMCA Standard 211 and comply with the requirements of the AMCA Certified Ratings Program. For performance data, please visit www.hartzellflow.com or contact your local sales representative.

Principal Dimensions (inches) – Series 34

Fan Size	A	B	C	D	F	J	K	Max Motor Frame	Max Fan Weight
12	12⅛	16¼	14½	3/16	20	5/16	6	145T	90
16	16⅛	20	18½	3/16	21	5/16	6	145T	100
18	18⅛	22⅛	20½	¼	22	5/16	6	184T	125
20	20⅛	24⅛	22½	¼	25	5/16	6	143T	140
24	24⅛	28½	26⅝	¼	25	7/16	6	215T	170
28	28⅛	32⅝	30⅝	¼	25	7/16	6	254T	200
32	33	36½	34⅛	¼	28	7/16	6	254T	280
36	37	40⅝	38⅛	¼	28	7/16	6	256T	325
40	41	44⅛	43⅛	5/16	36	7/16	12	215T	440
44	45	48⅛	47⅛	5/16	36	7/16	12	286T	510
48	49⅛	53⅜	51⅝	5/16	36	7/16	12	324T	600
54	55⅜	59⅝	57⅞	5/16	40	7/16	12	326T	835
60	61⅜	65⅝	63⅜	5/16	40	7/16	12	364T	930

*Weight without motor and accessories.

Series 35

Fiberglass Duct Axial® Fan, Belt Drive

For performance data, please visit www.hartzellflow.com or contact your local sales representative.

Options & Accessories

Refer to pages listed below for details.

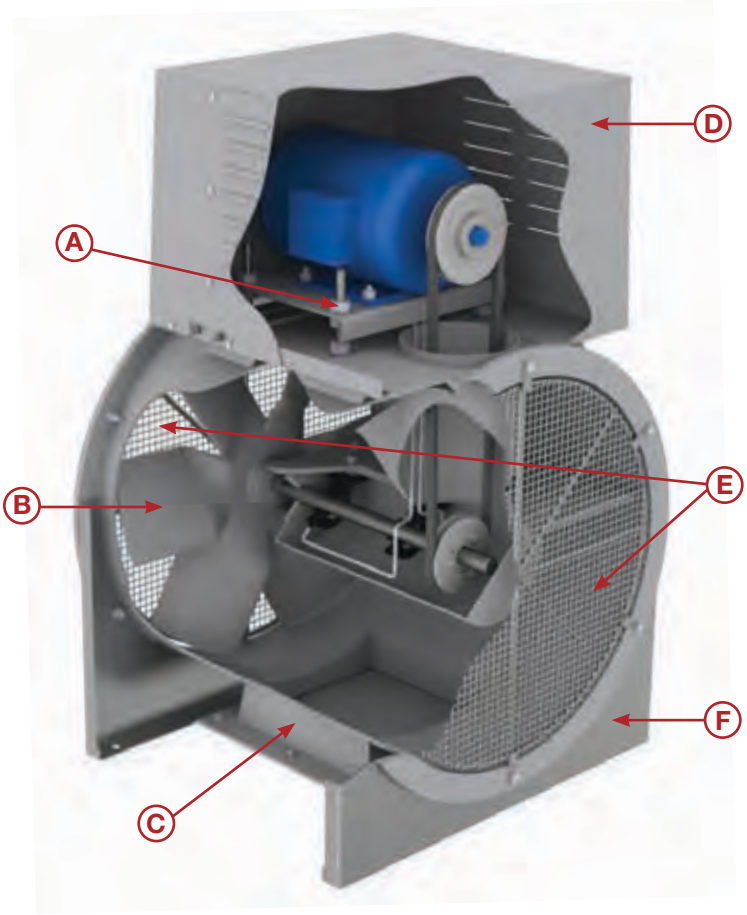
Hartzell Air Movement certifies that the Series 35, Fiberglass Belt Drive Duct Axial Fan, shown herein is licensed to bear the AMCA seal for air performance. Ratings are based on tests and procedures performed in accordance with AMCA Standard 211 and comply with the requirements of the AMCA Certified Ratings Program. For performance data, please visit www.hartzellflow.com or contact your local sales representative.

Series 35 Fiberglass Duct Axial® Fans combine many of the best features of the rugged, highly efficient Vaneaxial Blower with the economical performance of the Hartzell Duct Fan. Duct Axial Fans provide maximum efficiency in the static pressure range from 1" to 3" at low speeds and with surprisingly low noise characteristics. They are designed for duct installations where the nature of the corrosive airstream warrants isolation of the motor and drive assembly from the airstream.

Features

- **Sizes –** 12" to 60"
- **Performance –** 600 CFM at 1" to 30,000 CFM at 4 1/2" S.P.
- **Motor –** Motors are exterior mounted out of the airstream. The propeller shaft rotates in two heavy-duty bearings mounted on fiberglass supports taped to the inner shell with "T" reinforcements. Open end protected motors are standard. Special motors are available upon request.
- **Corrosion-Duty Construction –** Belts, bearings, sheaves and shaft are enclosed and protected from the airstream. The drive compartment is located on the negative pressure (suction) side of the propeller drawing in ambient air from outside the fan and over the belts and bearings. This ensures a contaminate-free drive compartment.
- **Propellers –** One piece, solid fiberglass construction. The 6-blade, Type E, airfoil design moves large volumes of air at medium pressures.
- **Bearings –** Heavy-duty, self-aligning, deep-row, radial-ball type shielded and mechanically sealed in cast iron or malleable housing. Bearings are relubricable for continuous service. Minimum 50,000 hrs. L-10 bearing life.
- **V-Belt Drives –** Over-sized for continuous duty. Variable pitch drives are standard on units up to and including 10 HP. Variable-pitch drives can be furnished on higher horsepower units upon request. Belts are oil, heat and static-resistant type.
- **Extended Lube Tubes –** Extend from bearings to exterior of fan housing.
- **Shaft –** Stainless steel and keyed at both ends with a neoprene slinger, neoprene seal, and fiberglass cover plate. Monel shafts are available on request.
- **Hardware –** Internal bolts are stainless steel and resin coated after assembly. Monel bolts are optional.

Series 35 Sectional View



A. Drive Tensioning Bolts
Provides easy method to adjust belt tension

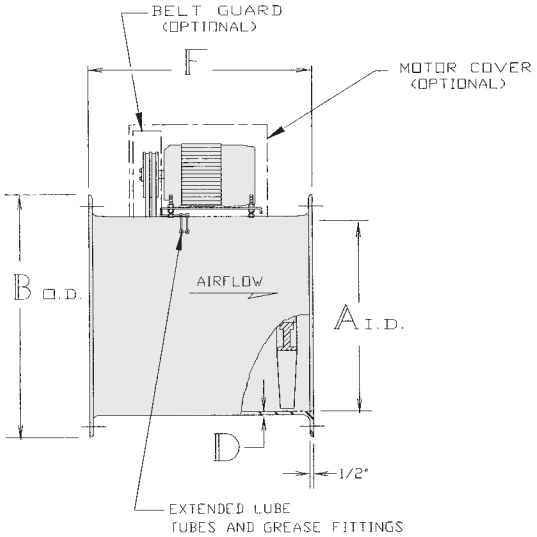
B. Propeller
One piece, solid fiberglass construction, die formed of individual laminations of cloth mat plus woven roving for additional strength. Series 35 fans use a 6-blade (Type E) propeller with an airfoil design to move large volumes of air at medium pressures.

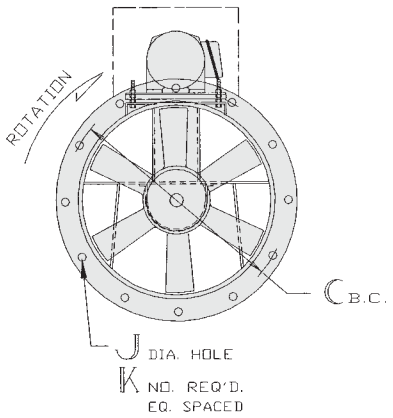
C. Access Door (Optional)
Raised, bolted door held in place with zinc plated bolts and gasketed for a tight seal. Allows for easy access to the propeller compartment.

D. Motor Cover (Optional)
Solid fiberglass construction, die-formed with injection molded louvers. Protects the drive assembly.

E. Inlet and Outlet Guard (Optional)
Epoxy coated steel guards available to protect the propeller.

F. Mounting Feet (Optional)
Bolted to the inlet and discharge flanges, mounting feet allow for positioning of the duct fan on a floor, ceiling, wall or platform. Can be used with vibration isolators. Epoxy coated steel construction.





Principal Dimensions (inches) – Series 35

Fan Size	A	B	C	D	F	J	K	Max Motor Frame	Max Fan Weight
12	12⅛	16¼	14½	⅜	20	⅝	6	145T	90
16	16⅛	20	18½	⅜	21	⅝	6	145T	100
18	18⅛	22⅛	20½	¼	22	⅝	6	184T	125
24	24⅛	28½	26⅝	¼	25	⅞	6	215T	170
28	28⅛	32⅝	30⅝	¼	25	⅞	6	254T	200
32	33	36½	34⅞	¼	28	⅞	6	254T	280
36	37	40⅝	38⅞	¼	28	⅞	6	256T	325
44	45	48⅛	47⅛	⅝	36	⅞	12	286T	510
48	49⅛	53⅜	51⅝	⅝	36	⅞	12	324T	600
54	55⅜	59⅝	57⅞	⅝	40	⅞	12	326T	835
60	61⅜	65⅝	63⅝	⅝	40	⅞	12	364T	930
54	55⅜	59⅝	57⅞	⅝	40	⅞	12	326T	835
60	61⅜	65⅝	63⅝	⅝	40	⅞	12	364T	930

*Weight without motor and accessories.

For performance data, please visit www.hartzellflow.com or contact your local sales representative.

Options & Accessories

Refer to pages listed below for details.

Hartzell Air Movement certifies that the Series 35V, Fiberglass Belt Drive Duct Vanaxial Fan, shown herein is licensed to bear the AMCA seal for air performance. Ratings are based on tests and procedures performed in accordance with AMCA Standard 211 and comply with the requirements of the AMCA Certified Ratings Program. For performance data, please visit www.hartzellflow.com or contact your local sales representative.

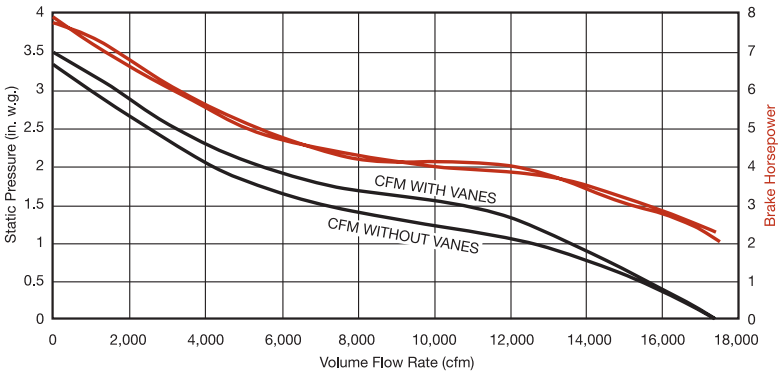
Series 35V

Fiberglass Duct Vaneaxial Fan, Belt Drive

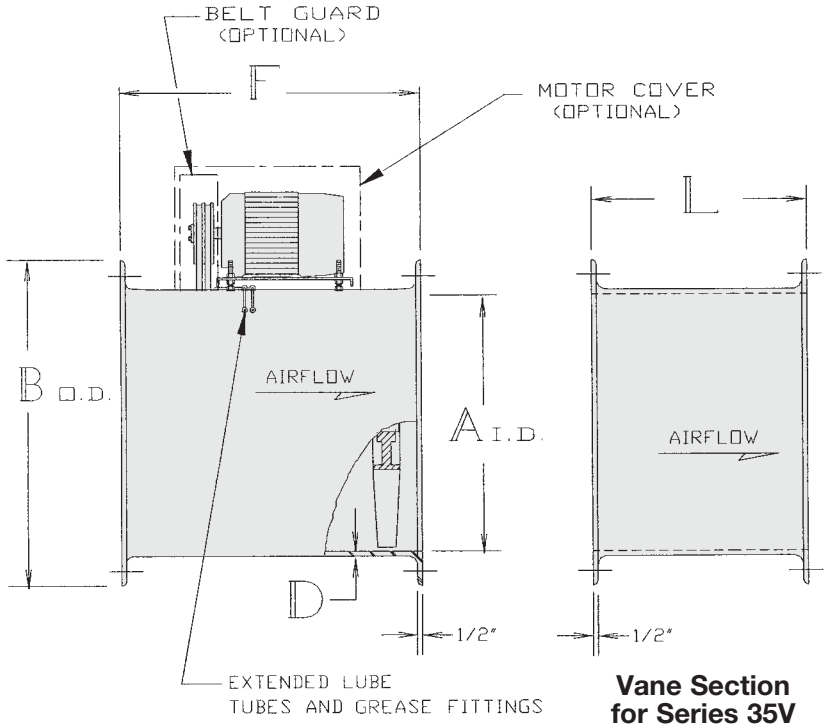
The addition of a specially designed vane section to the Series 35 Fiberglass Duct Axial® Fan changes the design configuration to a Duct Vaneaxial Fan. The addition of the vane section to the discharge side of any duct axial fan makes it perform efficiently as a low-powered vaneaxial on the upper side of its pressure curve. Near free air, the guide vanes offer no advantages, but beyond the mid-range, the vanes provide about 30% more static pressure with the same horsepower.

The purpose of the discharge vane is two-fold. Air leaves any axial fan wheel with a rotational component to the flow that increases from free air to block-off. The rotational component (spin) is straightened by the vanes to give a smoother flow leaving the fan discharge. A large part of the rotational kinetic energy is converted to potential energy resulting in higher static pressure for the fan.

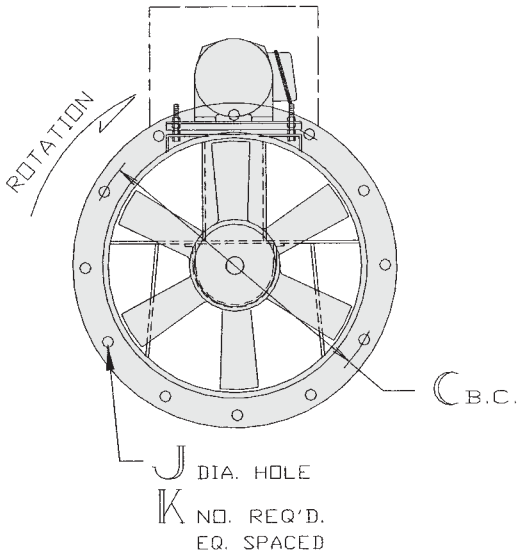
Comparison of 36” Duct Axial Fans: With and Without Vane Section



Series 35V Fiberglass Duct Vaneaxial Fan



Vane Section for Series 35V



Principal Dimensions (inches) – Series 35V

Fan Size	A	B	C	D	F	J	K	L	Max Motor Frame	*Max Fan Weight
12	12⅞	16¼	14½	3/16	20	5/16	6	6	145T	105
16	16⅞	20	18½	3/16	21	5/16	6	10	145T	120
18	18⅞	22⅛	20½	¼	22	5/16	6	11	184T	150
24	24⅞	28½	26⅝	¼	25	7/16	6	13	215T	210
28	28⅞	32⅝	30⅝	¼	25	7/16	6	13	254T	250
32	33	36½	34⅛	¼	28	7/16	6	15	254T	345
36	37	40⅝	38⅛	¼	28	7/16	6	16	256T	405
44	45	48⅛	47⅛	5/16	36	7/16	12	19	286T	615
48	49⅛	53⅜	51⅝	5/16	36	7/16	12	22	324T	735
54	55⅛	59⅝	57⅞	5/16	40	7/16	12	23	326T	995
60	61⅛	65⅝	63⅜	5/16	40	7/16	12	25	364T	1120

*Weight without motor and accessories.

Not looking for a fiberglass fan? Hartzell Air Movement manufactures hundreds of different steel, aluminum and stainless steel fans for water and wastewater applications as well. Contact your local sales representative for details!

Options and Accessories

Abrasive/Erosive Resistant Coating

HartKoate is an abrasive/erosive resistant coating developed by Hartzell Air Movement for application in environments where abrasive/erosive conditions may exist. HartKoate helps prevent premature deterioration of equipment in environments where uncoated fans may fail.

HartKoate is applied to a 50-60 mil thickness suitable for temperatures to 200°F.

HartKoate is particularly appropriate for use when water mist and/or abrasive particles exist in the airstream.

Contact your Hartzell representative for further details concerning the application of HartKoate coating to fiberglass fans in corrosive atmospheres.

Hi-Cor Construction

All airstream surfaces exposed to corrosive environment will be protected with a layer of Synthetic (Nexus) surfacing veil. An additional final coat of resin will be applied for extra corrosion resistance.

When Hi-Cor construction is required, the factory should be consulted concerning the corrosive environment involved.

Electrostatically Grounded

For applications in which fiberglass products are handling gas fumes that are not only corrosive but also potentially explosive, the equipment should be specially constructed to control and remove static electricity. Interior airstream surfaces can be coated with a "carbon rich" resin coat.

Grounding straps are secured from the side of the housing to the fan's steel base. All that remains to effectively ground the airstream is to ground the fan base at the time of installation.

ASTM D4167-97 Construction

(ASTM D4167-97, Standard Specification for Fiber-Reinforced Plastic Fans and Blowers.) For corrosive systems where ASTM construction is specified this construction option adds: synthetic veil and electrostatically conductive surface coating applied to airstream housing and impeller surfaces, special nameplates, and special final dynamic balancing to fan.

Companion Flanges

Drilled to fit the flanges of the duct fan; allows easy installation. Fiberglass construction.

Fiberglass Motor Cover

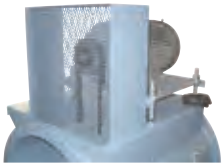
Designed to fit fiberglass duct and duct axial fans. The cover is solid fiberglass and die-formed with injection molded louvers.

Combination Motor Cover & Belt Guard

Designed to fit belt drive duct fans. Covers are vented. Specify horizontal or vertical mounting. Epoxy coated steel construction.

Belt Guard

Covers motor sheave and belts outside the fan housing. Epoxy coated steel construction.



Mounting Feet/Ceiling Suspension

Bolted to the inlet and discharge flanges, mounting feet allow for positioning of the duct fan on a floor, ceiling, wall or platform. Can be used with vibration isolators. Epoxy coated steel construction. Also available in rigid PVC; please contact factory.

Inlet and Outlet Guards

Constructed of epoxy coated steel. OSHA approved.

Roof Mounted – Upblast

Together with a fiberglass curb panel and fiberglass stack cap, a Hartzell Duct Fan or Bifurcated Fan can be mounted as a roof exhauster. The stack cap has back draft dampers to provide a weather-tight closure for vertical air discharge.

Roof Mounted – Hooded

When required, a Hartzell Duct Fan or Bifurcated Fan can be supplied with a fiberglass weather hood. These power roof ventilators can be used for intake or exhaust.

Hartzell

AIR MOVEMENT

Fiberglass Radial Blowers

SERIES 42

SERIES 43

Fiberglass Radial Blowers

Standard Construction Features

- **FRP Construction –**All structural parts in the airstream are fiberglass and resin. All fiberglass surfaces are protected with a minimum 10-mil thickness of chemical, flame, and ultraviolet resistant resin.

  – **Housings –** Constructed of fiberglass and a corrosion resistant vinylester resin with a class I flame spread rate of 25 or less

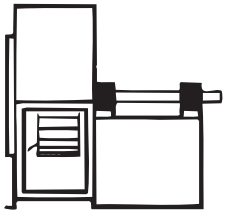
  – **Wheels –** Constructed of fiberglass and a vinylester resin with a class I flame spread rate of 25 or less

- **Shafts –** Turned, ground, polished, and keyed at both ends with a fiberglass sleeve in the airstream. Shafts are sized to operate well below critical speed. 304 or 316 stainless steel or monel shafting is available as an option at extra cost.
- **Hardware –** Internal hardware (airstream) is type 304 stainless steel and encapsulated. All external hardware (out of airstream) is zinc plated as standard. Where metal is subject to attack by the corrosive elements being handled, all metal parts can be resin-coated after assembly.
- **Shaft Seal –** A fiberglass and neoprene shaft seal is placed where the shaft leaves the housing along with a neoprene shaft slinger between the seal and wheel on belt drive units. The seal is not gas tight.
- **Bearings –** Bearings on belt drive units are heavy duty, deep row radial ball or double row spherical roller type self-aligning and shielded in cast iron housings. Long inner races insure even load distribution, providing a high radial and thrust load capacity. Bearings are relubricable for continuous service with lubrication tubes extended to the exterior of fan base as necessary.
- **V-Belt Drives –** Oversized for long life and continuous duty. Fixed pitch or variable pitch drives are available upon request. Belts are oil, heat, and static resistant type.

Centrifugal Fan Arrangements

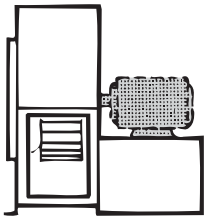
Arrangement 1

Unit furnished with shaft and bearings, less motor and drive. Designed to be driven by a separately mounted motor. Impeller is overhung – two bearings on base.



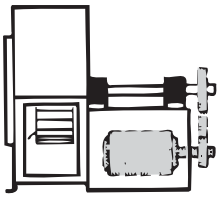
Arrangement 4

Direct drive packaged unit, wheel is overhung and attached to the shaft of the electric motor. No bearings on fan. Temperature limitations: 200°F Series 42 only.



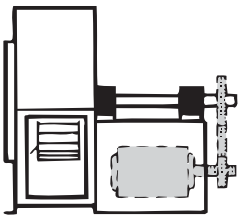
Arrangement 9

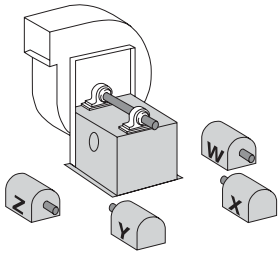
Belt drive configuration with motor mounted on outside of bearing base support. Packaged unit, wheel is overhung, slide rail motor base permits easy adjustment of belt tension. Available on either left or right hand side of base (when facing drive end of shaft).



Arrangement 10

Belt drive configuration with motor mounted inside base. Packaged unit, wheel is overhung.





Motor Position Designation

Motor position designation is necessary when ordering the following for Arrangement 1 fans –

1 - V Belt Drive
2 - Vibration Bases
3 - Belt Guards

Note: Location of motor is determined by facing the drive side of the fan and designating the motor position by letters W, X, Y or Z.

Adapted from AMCA Standard 99-2404-03, **Drive Arrangements for Centrifugal Fans**, and AMCA Standard 99-2407-03, **Motor Positions for Belt or Chain Drive Centrifugal Fans**, with written permission from Air Movement and Control Association International, Inc.

Series 42

Fiberglass Pressure Blower, Direct or Belt Drive, SWSI

Blowers available in SWSI only

The Series 42 Fiberglass Pressure Blower is particularly suited for lab hood installations. It is available in direct or belt drive in SWSI (single width single inlet) only. The direct drive pressure blower moves air at static pressures up to 12".

Features

- **Sizes –** 10" – 14"
- **Performance –** 100 CFM to 2,000 CFM and S.P. to 12".
- **Arrangements –** Available in Arrangements 4 or 10.
- **Temperature –** Suitable for temperatures up to 200° F
  Note: Temperature correction factors must be applied when operating at other than ambient conditions (70ºF). See Maximum Safe Speed Correction Factors chart on page 79.
- **FRP Construction –** All structural parts in the airstream are fiberglass and resin. All fiberglass surfaces are protected with a minimum 10-mil thickness of chemical, flame, and ultraviolet resistant resin.

  – **Wheel –** Solid fiberglass wheel molded with Derakane 510-A corrosion resistant vinylester resin with a Class I flame spread rate of 25 or less.

  – **FRP Components & Housing –** Constructed of fiberglass and corrosion resistant vinylester resin with a Class I flame spread rate of 25 or less.

  See the Corrosion Resistance Guide on page 79 for resin characteristics. Other resins are available.
- **Rotation –** Clockwise rotation is standard. Counterclockwise rotation is available.
- **Discharges –** Available discharges are shown on the next page. Rotatable in field.
- **Type F Wheel –** One-piece, solid construction, die formed of individual laminations of fiberglass in a flat blade radial design.
- **Motor –** Available to your specifications. All motors are mounted and units are test run and electronically balanced before shipment.
- **Easy Installation and Maintenance –** Motors are readily accessible for ease in wiring, installation, adjustment and lubrication.
- **Flanges –** Flanged outlets are standard. Inlet flanges are optional. Drilling of flanges is optional.
- **Bases –** Heavy gauge hot rolled steel, epoxy coated

For Belt Drive Units:

- **V-Belt Drive –** Oversized for continuous duty. Belts are oil, heat and static resistant type.
- **Bearings –** Heavy-duty, self-aligning, pillow block bearings are standard.
- **Shaft –** Turned, ground, polished, keyed at both ends and fiberglass enclosed in the airstream. Stainless steel (304 or 316) or monel shafting is available as an option at extra cost.
- **Shaft Seal –** A fiberglass and neoprene shaft seal is placed where the shaft leaves the housing along with a neoprene shaft slinger between the seal and wheel. The seal is not gas tight.

Arrangement 4

Type F Wheel

For performance data, please visit www.hartzellflow.com or contact your local sales representative.

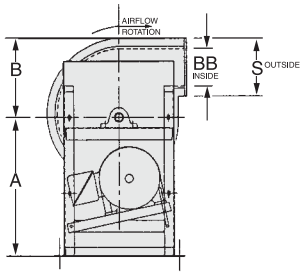
Options & Accessories

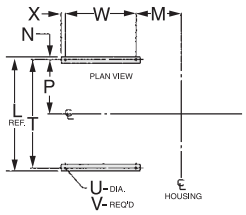
Refer to pages listed below for details.

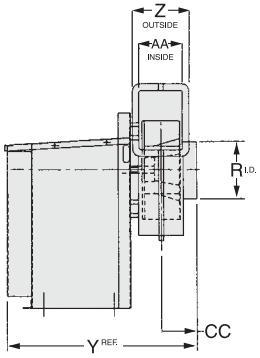
Hartzell Air Movement certifies that the Series 42, Fiberglass Pressure Blower, shown herein is licensed to bear the AMCA seal for air performance. Ratings are based on tests and procedures performed in accordance with AMCA Standard 211 and comply with the requirements of the AMCA Certified Ratings Program. For performance data, please visit www.hartzellflow.com or contact your local sales representative.

Dimensions - Arrangement 10

Series 42, Type F – Sizes 10” to 14” – Rotatable Housing







Principal Dimensions (inches) – Series 42 – Sizes 10” - 14”

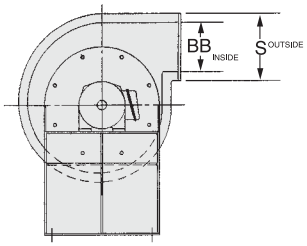
Fan Size	A	B	C	D	E	F	G	H	J	L	M	N	P	R
10	18 1/16	10 5/8	9	9 5/8	10 1/8	13 7/8	9 1/8	8 5/8	8 1/8	21 1/4	6 15/16	3/4	9 7/8	6
12	18 1/16	11 5/8	10	10 5/8	11 1/8	15 5/16	10 1/8	9 5/8	9 1/8	21 1/4	7 5/16	3/4	9 7/8	7
14	18 1/16	12 5/8	11	11 5/8	12 1/8	16 3/4	11 1/8	10 5/8	10 1/8	21 1/4	7 9/16	3/4	9 7/8	8

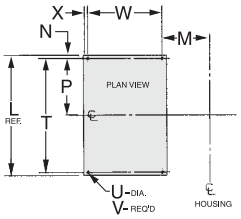
Fan Size	S	T	U	V	W	X	Y	Z	AA	BB	CC	Max. Motor Frame*	Max. Fan Weight**
10	7 1/16	19 3/4	9/16	4	12	2	30 1/16	7	3 3/4	4 3/16	4 1/4	182T	85
12	8 1/4	19 3/4	9/16	4	12	2	30 7/16	7 3/4	4 1/2	5	4 5/8	182T	90
14	9 1/4	19 3/4	9/16	4	12	2	31 5/16	8 1/4	5	6	4 7/8	182T	100

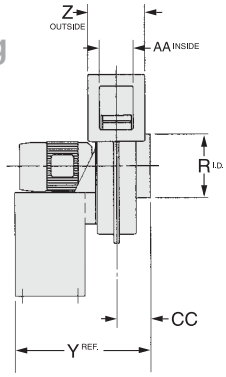
NOTE: Dimensions and specifications are subject to change. Certified prints are available.
**For motor frame sizes larger than standard 182T, contact factory. **Weight without motor and accessories.*

Dimensions - Arrangement 4

Series 42, Type F – Sizes 10” to 14” – Rotatable Housing







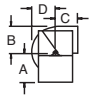
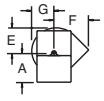
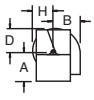
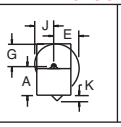
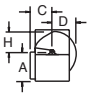
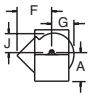
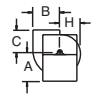
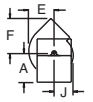
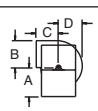
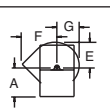
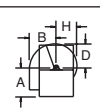
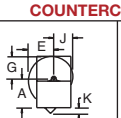
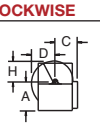
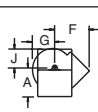
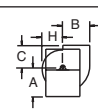
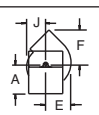
Principal Dimensions (inches) – Series 42 – Sizes 10” - 14”

Fan Size	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R
10	12 1/8	10 5/8	9	9 5/8	10 1/8	13 7/8	9 1/8	8 5/8	8 1/8	1 7/8	13	5 3/8	1	5 1/2	6
12	14 1/8	11 5/8	10	10 5/8	11 1/8	15 5/16	10 1/8	9 5/8	9 1/8	1 3/8	14 1/2	5 3/4	1	6 1/4	7
14	16 1/8	12 5/8	11	11 5/8	12 1/8	16 3/4	11 1/8	10 5/8	10 1/8	7/8	15 1/2	5 3/8	1	6 3/4	8

Fan Size	S	T	U	V	W	X	Y	Z	AA	BB	CC	Min. Motor Frame	Max. Motor Frame	Max. Fan Weight*
10	7 1/16	11	7/16	4	4 7/8	1”	15 11/16	7	3 3/4	4 3/16	4 1/4	56	143T	63
12	8 1/4	12 1/2	7/16	4	5 3/8	1”	16 15/16	7 3/4	41/2	5	4 5/8	56	184T	78
14	9 1/4	13 1/2	7/16	4	7 3/4	1”	19 3/16	8 1/4	5	6	4 7/8	145T	213T	97

*NOTE: Dimensions and specifications are subject to change. Certified prints are available. *Weight without motor and accessories.*

Fan Discharges

TOP HORIZONTAL	TOP ANGULAR DOWN	DOWN BLAST	BOTTOM ANGULAR DOWN	BOTTOM HORIZONTAL	BOTTOM ANGULAR UP	UP BLAST	TOP ANGULAR UP
CLOCKWISE							
							
COUNTERCLOCKWISE							
							

Series 43

Fiberglass Radial Blower, Belt Drive, SWSI

Blowers available in SWSI only

The Series 43 Fiberglass Radial Blower is a versatile blower designed to move air at static pressures up to 16". It is a belt drive unit available in SWSI (single width single inlet) only.

Features

- **Sizes –** 16" – 33"
- **Performance –** 250 to 18,000 CFM and S.P. to 18".
- **Arrangements –** Available in Arrangements 1, 9 or 10.
- **Temperature –** Suitable for temperatures up to 250° F
  Note: Temperature correction factors must be applied when operating at other than ambient conditions (70ºF). See Maximum Safe Speed Correction Factors chart on page 79.
- **FRP Construction –** All structural parts in the airstream are fiberglass and resin. All fiberglass surfaces are protected with a minimum 10-mil thickness of chemical, flame, and ultraviolet resistant resin.

  – **Wheel –** Solid fiberglass wheel molded with Derakane 510-A corrosion resistant vinylester resin with a Class I flame spread rate of 25 or less.

  – **FRP Components & Housing –** Constructed of fiberglass and corrosion resistant vinylester resin with a Class I flame spread rate of 25 or less.

  See the Corrosion Resistance Guide on page 79 for resin characteristics. Other resins are available.
- **Rotation –** Clockwise rotation is standard. Counterclockwise rotation is available.
- **Discharges –** Available discharges are shown on the next page. Rotatable in field.
- **Type F Wheel –** Multi-piece radial design constructed of solid fiberglass and bonded with resin and fiberglass material.
- **Motor –** Available to your specifications. All motors are mounted and units are test run and electronically balanced before shipment.
- **Easy Installation & Maintenance –** Motor, drive and bearings are readily accessible for ease in wiring, installation, adjustment and lubrication.
- **V-Belt Drive –** Oversized for continuous duty. Belts are oil, heat and static resistant type.
- **Bearings –** Heavy-duty, self-aligning, pillow block bearings are standard.
- **Shaft –** Turned, ground, polished, keyed at both ends and fiberglass enclosed in the airstream. Stainless steel (304 or 316) or monel shafting is available as an option at extra cost.
- **Shaft Seal –** A fiberglass and neoprene shaft seal is placed where the shaft leaves the housing along with a neoprene shaft slinger between the seal and wheel. The seal is not gas tight.
- **Flanges –** Flanged outlets are standard. Inlet flanges are optional. Drilling of flanges is optional.
- **Bases –** Heavy gauge hot rolled steel, epoxy coated

Type F Wheel

For performance data, please visit www.hartzellflow.com or contact your local sales representative.

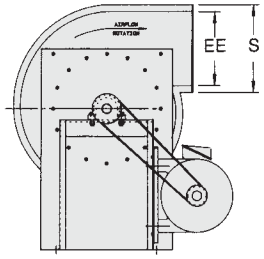
Options & Accessories

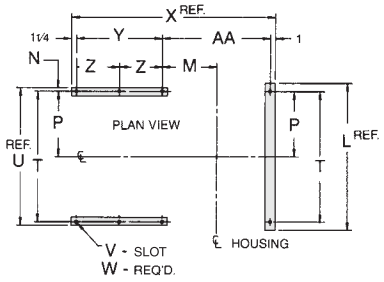
Refer to pages listed below for details.

Hartzell Air Movement certifies that the Series 43, Fiberglass Radial Blower, shown herein is licensed to bear the AMCA seal for air performance. Ratings are based on tests and procedures performed in accordance with AMCA Standard 211 and comply with the requirements of the AMCA Certified Ratings Program. For performance data, please visit www.hartzellflow.com or contact your local sales representative.

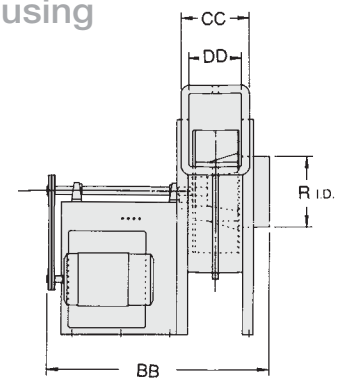
Dimensions - Arrangements 1, 9 or 10

Series 43, Type F – Sizes 16” to 26” – Rotatable Housing





CLOCKWISE ROTATION SHOWN,
COUNTERCLOCKWISE OPPOSITE



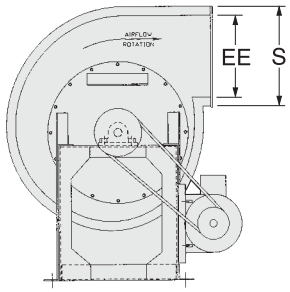
Principal Dimensions (inches) – Series 43 – Sizes 16” - 26”

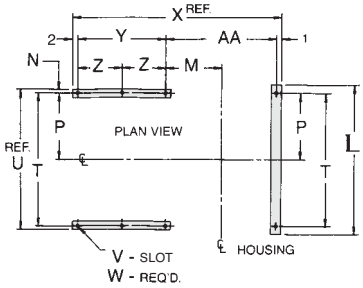
Fan Size	A	B	C	D	E	F	G	H	J	L	M	N	P	R	S	T
16	21½	14⅞	12⅛	13 11/16	14¼	19 1/16	13 1/16	12½	11⅞	20¾	6¼	1	9⅛	9	12 1/16	18¼
19	24¼	18	15	16½	17¼	23⅜	15¾	15	14¼	27¾	8 11/16	1 5/16	12 11/16	11	14	25⅜
23	30	20⅞	18¼	19⅛	20	27 11/16	18¼	17⅜	16½	28⅛	7 15/16	1	12 11/16	13	16	25⅜
26	30	23 13/16	20¼	21 13/16	22 13/16	31⅛	20 13/16	19 13/16	18 13/16	28⅛	8 13/16	1	12 11/16	15	18	25⅜

Fan Size	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	Max. Motor Frame	Max. Fan Weight*
16	20¼	11/16 x 1 1/16	6	29½	15¾	–	11½	34⅛	10½	7¼	8 13/16	215T	315
19	27¼	11/16 x 1 1/16	8	35⅞	18¾	9⅜	14⅛	41½	12⅛	8⅞	10¾	256T	394
23	27⅜	11/16 x 1 1/16	8	37⅝	20¼	10⅛	15⅛	45	13¾	10½	12¾	286T	485
26	27⅜	11/16 x 1 1/16	8	39 7/16	20¼	10⅛	16 15/16	47 13/16	15⅜	12⅛	14¾	286T	560

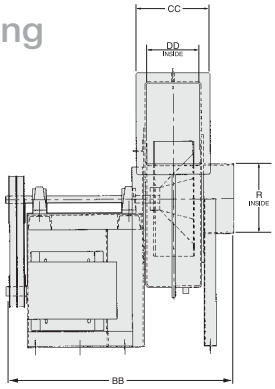
*NOTE: Dimensions and specifications are subject to change. Certified prints are available. *Weight without motor and accessories.*

Series 43, Type F – Sizes 30” and 33” – Rotatable Housing





CLOCKWISE ROTATION SHOWN,
COUNTERCLOCKWISE OPPOSITE



Principal Dimensions (inches) – Series 43 – Sizes 30” and 33”

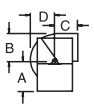
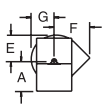
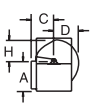
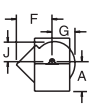
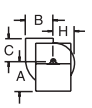
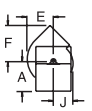
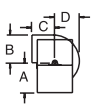
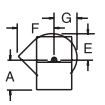
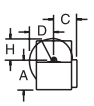
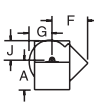
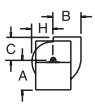
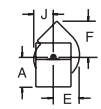
Fan Size	A	B	C	D	E	F	G	H	J	L	M	N	P	R	S	T
30	37	26⅞	22¾	24 9/16	25¾	35 1/16	23 7/16	22 5/16	21 3/16	35¾	12 9/16	2⅛	16⅞	17	20	33¾
33	37	29 9/16	25½	27 1/16	28 5/16	39	25⅞	24 9/16	23 5/16	35¾	13⅜	2⅛	16⅞	19	21⅛	33¾

Fan Size	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	Max. Motor Frame	Max. Fan Weight*
30	38	13/16 x 1¼	8	47 5/16	22¾	11⅜	21 9/16	56	17	13¾	16¾	286T	646
33	38	13/16 x 1¼	8	49 15/16	22¾	11⅜	23 3/16	58⅛	18 9/16	15 5/16	18⅝	286T	710

*NOTE: Dimensions and specifications are subject to change. Certified prints are available. *Weight without motor and accessories.*

Fan Discharges

For angular and/or down blast discharges, please contact the factory when discharge flanges are required.

TOP HORIZONTAL	TOP ANGULAR DOWN	BOTTOM HORIZONTAL	BOTTOM ANGULAR UP	UP BLAST	TOP ANGULAR UP
CLOCKWISE					
					
COUNTERCLOCKWISE					
					

Options and Accessories

Abrasive/Erosive Resistant Coating

HartKoate is an abrasive/erosive resistant coating developed by Hartzell Air Movement for application in environments where abrasive/erosive conditions may exist. HartKoate helps prevent premature deterioration of equipment in environments where uncoated fans may fail.

HartKoate is applied to a 50-60 mil thickness suitable for temperatures to 200°F.

HartKoate is particularly appropriate for use when water mist and/or abrasive particles exist in the airstream.

Contact your Hartzell representative for further details concerning the application of HartKoate coating to fiberglass fans in corrosive atmospheres.

Hi-Cor Construction

All airstream surfaces exposed to corrosive environment will be protected with a layer of Synthetic (Nexus) surfacing veil. An additional final coat of resin will be applied for extra corrosion resistance.

When Hi-Cor construction is required, the factory should be consulted concerning the corrosive environment involved.

Electrostatically Grounded

For applications in which fiberglass products are handling gas fumes that are not only corrosive but also potentially explosive, the equipment should be specially constructed to control and remove static electricity. Interior airstream surfaces can be coated with a "carbon rich" resin coat.

Grounding straps are secured from the side of the housing to the fan's steel base. All that remains to effectively ground the airstream is to ground the fan base at the time of installation.

ASTM D4167-97 Construction

(ASTM D4167-97, Standard Specification for Fiber-Reinforced Plastic Fans and Blowers.) For corrosive systems where ASTM construction is specified this construction option adds: synthetic veil and electrostatically conductive surface coating applied to airstream housing and impeller surfaces, special nameplates, and special final dynamic balancing to fan.

Drain

Fiberglass half coupling assembled in housing, NPT female threaded fitting.

Series 42 and Series 43:
Sizes 16" – 26": ½" NPT

Series 43:
Sizes 30" and 33": 1" NPT

Inspection Door

Allows for periodic visual inspection of the wheel. Constructed of fiberglass, fastened with stainless steel bolts and gasketed for tight seal. **Series 43 only.**

Flanged Inlet

Fiberglass inlet flange is available. Flanges are drilled upon request. Note: A flanged and drilled inlet is required when an inlet control damper is used.

Disconnect Switch

On-off switch mounted to the unit to provide safety during maintenance. **Series 43 only.**

Inlet Boxes

Constructed of solid fiberglass, an inlet box improves entry conditions and minimizes losses, which are generally associated with duct elbows at the fan inlet. Inlet boxes are designed for specific applications. Please contact factory.

Vibration Isolators

Rubber-in-shear or spring type isolators are available.

Combination Drive Guard & Weather Cover

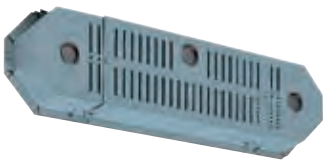
Constructed of epoxy coated steel. Covers motor and shaft sheaves as well as belts. Guards the drive and provides weather protection. Please specify fan arrangement. **Series 43 only.**

Arrangement 9

Drive Guards

Encloses the drive assembly while permitting circulation of ambient air. Standard features include: tach opening, belt tension openings and adjustable length.

Shaft Guard
Arrangement 9 or 1



Belt Drive Guard
Arrangement 9

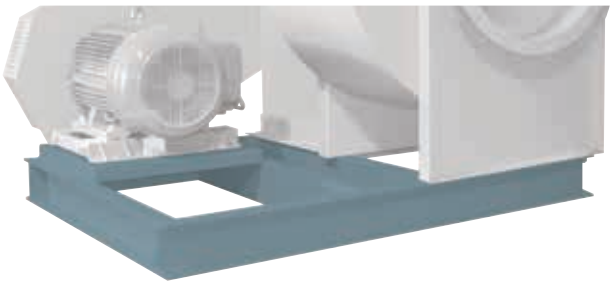
Inlet and Outlet Guards

A spiral ring guard can be furnished for the inlet side and a wire mesh guard can be furnished for the outlet side. Guards are constructed of epoxy coated steel.

Options and Accessories

Arrangement 1 Sub-Base

Common structural support for Arrangement 1 fan and motor. Please specify motor mounting position. Epoxy coated steel construction. **Series 43 only.**



Inlet Control Damper

Dampers are mounted on the blower's drilled inlet flange to increase the efficiency of the system and permit control of air volume. Dampers are fiberglass, epoxy coated or stainless steel construction.

Outlet Control Damper

Dampers are mounted directly on the blower outlet to control the volume of air delivered to the system. Opposed and parallel blade dampers are available in steel, stainless steel, coated steel and solid fiberglass.

Parallel Blade Type

Best suited for applications requiring accurate air volume in a range from wide open to 75% open. Usually used for balancing the system or for modulated control when pressure drop is variable.

Parallel Blade

Opposed Blade Type

Best suited for control over a broad range of air volume with more precise control.

Opposed Blade

Both types-of outlet control dampers are available in three classifications:

Class I – Maximum static pressure: 5" S.P.
Maximum velocity: 3,900 FPM

Class II – Maximum static pressure: 8½" S.P.
Maximum velocity: 5,100 FPM

Class III – Maximum static pressure: 20" S.P.
Maximum velocity: 6,000 FPM

Series 42 Fiberglass Pressure Blower at a Wastewater Treatment Plant

Series 43 Fiberglass Radial Blower at a Pump Station

Hartzell

AIR MOVEMENT

Fiberglass Air Control Products

SERIES FFL
SERIES FEP
SERIES FLC
SERIES FCO
SERIES FCP

Series FFL

Fiberglass Fixed Blade Drainable Louver

Constructed entirely of fiberglass, the Series FFL Fiberglass Fixed Blade Drainable Louver is recommended for air intake, exhaust or pressure relief applications where corrosive elements exist in fume or vapor form.

Advantages of Fiberglass Construction:

– Superior corrosions resistance
– Excellent dimensional stability – It will not become brittle at low temperatures and at 0°F, laminated fiberglass will be stronger than at room temperature
– Strength-to-weight ratio 43% greater than that of aluminum

Features:

- **FRP Construction –** All parts are constructed of fiberglass and Isophthalic vinyl resin with a Class I flame spread rate of 25 or less and utilize woven fiberglass mat material for superior strength. All surfaces are protected for ultra-violet resistance. Joints are bonded with an industrial grade epoxy adhesive, having similar corrosion resistant properties as a vinyl resin. Please refer to the Corrosion Resistance Guide on page 79 for topcoat resin applications for additional corrosion resistance.
- **Sizes –** Available in standard and custom sizes
- **Temperature –** Suitable for temperatures up to 200°F
- **Maximum Free Area Inlet Velocity –** 825 FPM
- **Maximum Louver Size –** 72” W x 72” H. Larger units are available in multiple panel construction with special reinforced manufacturing techniques.
- **Minimum Louver Size –** 12” W x 12” H
- **Frame –** 4” x $^{11}/_{16}$” x $^{1}/_{8}$” fiberglass reinforced vinyl
- **Blades –** Minimum .070” thick fiberglass reinforced vinyl
- **Draining –** Blades drain to either side with runoff discharged at bottom of louver.
- **Color –** Medium gray is standard. Other colors available upon request.
- **Mounting Configurations –** Available in angle or flange mount. Angle mounts are used for deep walls and flange mounts are used for narrow walls. Please check local building codes for specific installation requirements applicable to the project.

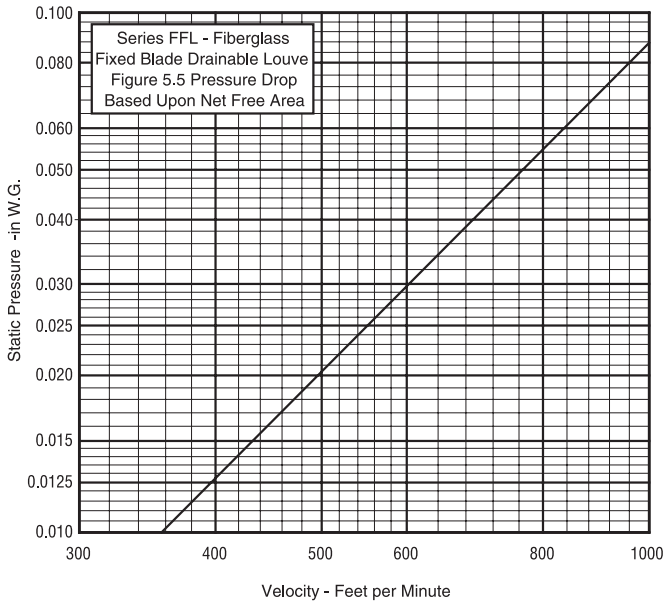
Options & Accessories

Refer to pages listed below for details.

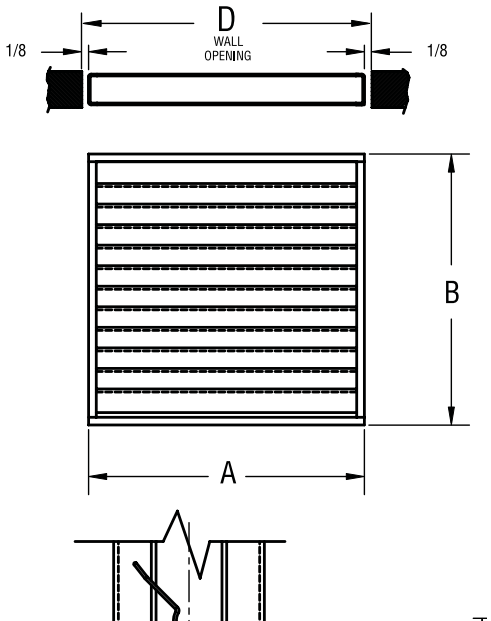
Ratings for Air Performance & Leakage

Hartzell Air Movement certifies that the Series FFL Fiberglass Fixed Blade Drainable Louver air performance ratings shown herein are reliable and accurate and in accordance with industry standards. Ratings are based on tests and procedures performed in accordance with AMCA Standard 500.

Performance Data



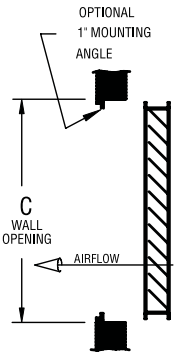
Dimensions: Series FFL



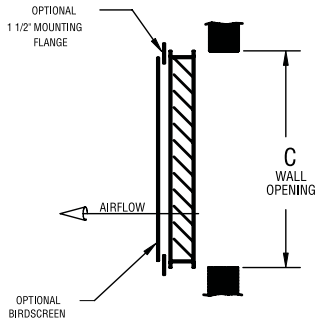
Dimensions (inches)

Fan Size	A	B	C	D
12	12	12	12 1/4	12 1/4
14	14	14	14 1/4	14 1/4
16	16	16	16 1/4	16 1/4
18	18	18	18 1/4	18 1/4
20	20	20	20 1/4	20 1/4
22	22	22	22 1/4	22 1/4
24	24	24	24 1/4	24 1/4
26	26	26	26 1/4	26 1/4
28	28	28	28 1/4	28 1/4
30	30	30	30 1/4	30 1/4
32	32	32	32 1/4	32 1/4
36	36	36	36 1/4	36 1/4
40	40	40	40 1/4	40 1/4
42	42	42	42 1/4	42 1/4
44	44	44	44 1/4	44 1/4
48	48	48	48 1/4	48 1/4
54	54	54	54 1/4	54 1/4
60	60	60	60 1/4	60 1/4
72	72	72	72 1/4	72 1/4

Angle Mount



Flange Mount



Free Area In Square Feet

Width

Height	12	14	16	18	20	22	24	26	28	30	32	36	40	42	44	48	54	60	72
12	.40	.48	.56	.65	.73	.81	.89	.97	1.05	1.13	1.21	1.38	1.54	1.62	1.70	1.87	1.96	2.21	2.70
14	.41	.50	.58	.66	.75	.83	.91	1.0	1.08	1.16	1.25	1.41	1.58	1.66	1.75	1.92	1.99	2.24	2.74
16	.47	.56	.66	.76	.85	.95	1.04	1.14	1.23	1.33	1.42	1.61	1.80	1.90	1.99	2.18	2.26	2.55	3.12
18	.54	.65	.76	.86	.97	1.08	1.19	1.30	1.41	1.52	1.63	1.85	2.06	2.17	2.28	2.50	2.59	2.92	3.57
20	.66	.80	.93	1.07	1.20	1.34	1.47	1.61	1.74	1.87	2.01	2.28	2.55	2.68	2.82	3.09	3.21	3.61	4.42
22	.72	.87	1.01	1.16	1.31	1.45	1.60	1.74	1.89	2.04	2.18	2.48	2.77	2.91	3.06	3.35	3.51	3.95	4.83
24	.79	.95	1.11	1.27	1.43	1.59	1.75	1.91	2.07	2.23	2.39	2.71	3.03	3.19	3.35	3.67	3.83	4.31	5.27
26	.87	1.05	1.23	1.40	1.58	1.76	1.93	2.11	2.29	2.47	2.64	3.0	3.35	3.53	3.7	4.06	4.24	4.78	5.83
28	.95	1.14	1.34	1.53	1.72	1.91	2.10	2.30	2.49	2.69	2.88	3.26	3.65	3.84	4.03	4.42	4.62	5.19	6.35
30	1.04	1.25	1.46	1.66	1.89	2.10	2.31	2.52	2.73	2.94	3.15	3.57	4.0	4.21	4.42	4.84	5.06	5.70	6.96
32	1.15	1.39	1.62	1.86	2.09	2.32	2.56	2.79	3.03	3.26	3.49	3.96	4.43	4.66	4.90	5.36	5.63	6.33	7.73
36	1.29	1.56	1.82	2.08	2.34	2.60	2.87	3.13	3.39	3.65	3.91	4.44	4.96	5.22	5.49	6.01	6.30	7.08	8.66
40	1.42	1.71	2.0	2.28	2.57	2.88	3.14	3.43	3.72	4.01	4.30	4.87	5.45	5.73	6.02	6.60	6.90	7.76	9.49
42	1.48	1.78	2.08	2.37	2.67	2.97	3.27	3.57	3.87	4.17	4.47	5.07	5.67	5.96	6.26	6.86	7.49	8.39	10.18
44	1.55	1.86	2.17	2.48	2.80	3.11	3.42	3.74	4.05	4.36	4.68	5.30	5.93	6.24	6.55	7.18	7.50	8.44	10.32
48	1.67	2.01	2.35	2.69	3.03	3.36	3.70	4.04	4.38	4.72	5.06	5.73	6.41	6.75	7.09	7.76	8.10	9.12	11.15
54	1.92	2.31	2.70	3.09	3.48	3.87	4.26	4.65	5.04	5.43	5.82	6.60	7.38	7.77	8.16	8.94	9.31	10.50	12.84
60	2.18	2.62	3.06	3.50	3.94	4.39	4.82	5.26	5.70	6.14	6.58	7.46	8.34	8.78	9.22	10.11	10.57	11.86	14.54
72	2.67	3.21	3.75	4.29	4.83	5.37	5.91	6.46	7.0	7.54	8.08	9.16	10.24	10.78	11.32	12.40	13.0	14.62	17.86

Series FEP

Fiberglass End-Pivoted Automatic Shutter

Constructed entirely of fiberglass, the Series FEP Fiberglass End-Pivoted Automatic Shutter is recommended for gravity backdraft prevention applications used in conjunction with low pressure, low velocity fans, such as propeller fans and utility sets. It is best suited for applications where corrosive elements exist in fume or vapor form.

Advantages of Fiberglass Construction:

– Superior corrosion resistance
– Excellent dimensional stability – It will not become brittle at low temperatures and at 0°F, laminated fiberglass will be stronger than at room temperature
– Strength-to-weight ratio 43% greater than that of aluminum

Features:

- **FRP Construction –** All parts are constructed of fiberglass and Isophthalic vinyl resin with a Class I flame spread rate of 25 or less and utilize woven fiberglass mat material for superior strength. All surfaces are protected for ultra-violet resistance. Joints are bonded with an industrial grade epoxy adhesive, having similar corrosion resistant properties as a vinyl resin. Please refer to the Corrosion Resistance Guide on page 79 for topcoat resin applications for additional corrosion resistance.
- **Sizes –** Available in standard and custom sizes
- **Temperature –** Suitable for temperatures up to 200°F
- **Maximum Face Velocity –** 2,500 FPM
- **Maximum Differential Pressure** – 1" W.G.
- **Maximum Panel Size –** 48" W x 48" H. Larger size units are available in multiple panel construction with special reinforced manufacturing techniques.
- **Minimum Panel Size –** 12" W x 12" H
- **Frame –** 4" x $^{11}/_{16}$" x $^{1}/_{8}$" fiberglass reinforced vinyl
- **Blades –** Minimum .070" thick fiberglass reinforced vinyl
- **Stops –** $^{1}/_{8}$" fiberglass reinforced vinyl angle
- **Axles –** $^{3}/_{4}$" diameter fiberglass reinforced vinyl rod
- **Bearings –** Fiber reinforced thermoplastic
- **Color –** Medium gray is standard. Other colors available upon request.
- **Mounting Configurations –** Available in duct or flange mount.

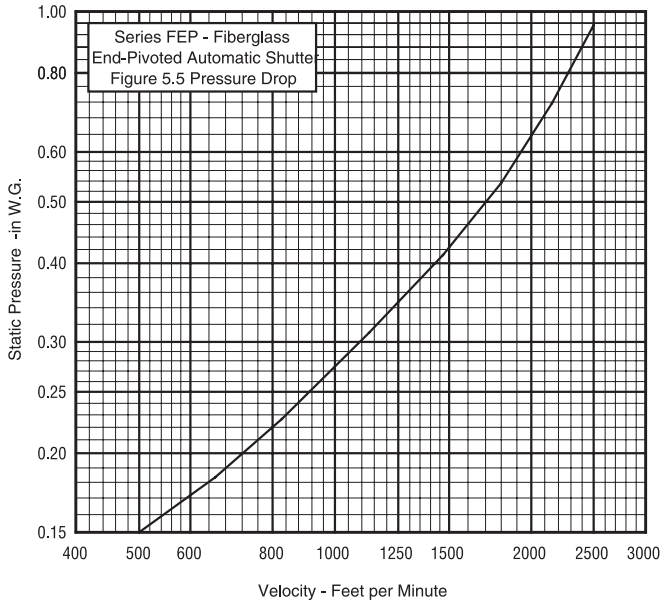
Options & Accessories

Refer to pages listed below for details.

Ratings for Air Performance & Leakage

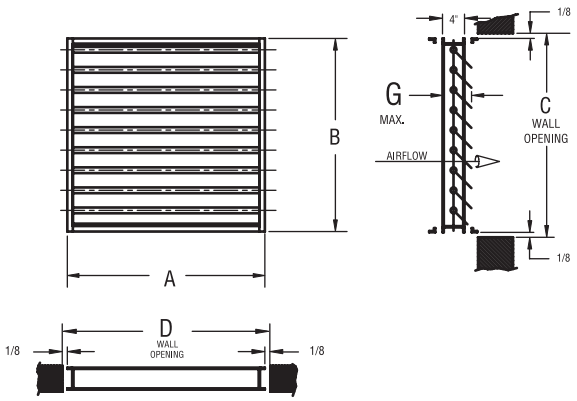
Hartzell Air Movement certifies that the Series FEP Fiberglass End-Pivoted Automatic Shutter air performance ratings shown herein are reliable and accurate and in accordance with industry standards. Ratings are based on tests and procedures performed in accordance with AMCA Standard 500.

Performance Data



Dimensions: Series FEP

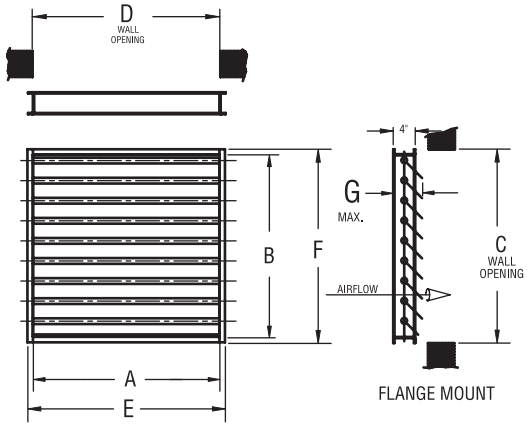
Duct Mount



Duct Mount Dimensions (in.) – Series FEP

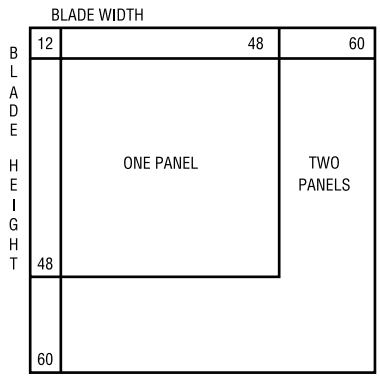
Nominal Shutter Size	A	B	C	D	G
12	12	12	12 1/4	12 1/4	6 1/4
14	14	14	14 1/4	14 1/4	6 1/4
16	16	16	16 1/4	16 1/4	6 1/4
18	18	18	18 1/4	18 1/4	6 1/4
20	20	20	20 1/4	20 1/4	6 1/4
22	22	22	22 1/4	22 1/4	8 13/16
24	24	24	24 1/4	24 1/4	6 1/4
26	26	26	26 1/4	26 1/4	8 13/16
28	28	28	28 1/4	28 1/4	8 13/16
30	30	30	30 1/4	30 1/4	8 13/16
32	32	32	32 1/4	32 1/4	8 13/16
36	36	36	36 1/4	36 1/4	8 13/16
40	40	40	40 1/4	40 1/4	8 13/16
42	42	42	42 1/4	42 1/4	8 13/16
44	44	44	44 1/4	44 1/4	8 13/16
48	48	48	48 1/4	48 1/4	8 13/16
54	54	54	54 1/4	54 1/4	8 13/16
60	60	60	60 1/4	60 1/4	8 13/16

Flange Mount



Flange Mount Dimensions (in.) – Series FEP

Nominal Shutter Size	A	B	C	D	E	F	G
12	12	12	12 1/4	12 1/4	14 1/8	14 1/8	6 1/4
14	14	14	14 1/4	14 1/4	16 1/8	16 1/8	6 1/4
16	16	16	16 1/4	16 1/4	18 1/8	18 1/8	6 1/4
18	18	18	18 1/4	18 1/4	20 1/8	20 1/8	6 1/4
20	20	20	20 1/4	20 1/4	22 1/8	22 1/8	8 13/16
22	22	22	22 1/4	22 1/4	24 1/8	24 1/8	6 1/4
24	24	24	24 1/4	24 1/4	26 1/8	26 1/8	6 1/4
26	26	26	26 1/4	26 1/4	28 1/8	28 1/8	6 1/4
28	28	28	28 1/4	28 1/4	30 1/8	30 1/8	8 13/16
30	30	30	30 1/4	30 1/4	32 1/8	32 1/8	8 13/16
32	32	32	32 1/4	32 1/4	34 1/8	34 1/8	8 13/16
36	36	36	36 1/4	36 1/4	38 1/8	38 1/8	8 13/16
40	40	40	40 1/4	40 1/4	42 1/8	42 1/8	8 13/16
42	42	42	42 1/4	42 1/4	44 1/8	44 1/8	8 13/16
44	44	44	44 1/4	44 1/4	46 1/8	46 1/8	8 13/16
48	48	48	48 1/4	48 1/4	50 1/8	50 1/8	8 13/16
54	54	54	54 1/4	54 1/4	56 1/8	56 1/8	8 13/16
60	60	60	60 1/4	60 1/4	62 1/8	62 1/8	8 13/16



Multiple Panel Units

For units larger than the 48” W x 48” H max. panel size

Multiple panels are fastened together with FRP strips adhered to the channel frame. Axles are 3/4” diameter FRP. For units up to 36”, axles are 4” long each end. For units above 36”, axles are full blade length.

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

Series FLC

Fiberglass Low Velocity Center-Pivoted Damper

Constructed entirely of fiberglass, the Series FLC Fiberglass Low Velocity Center-Pivoted Damper is recommended for backdraft control applications used in conjunction with low pressure, low velocity fans, such as propeller fans, power roof ventilators and utility sets. It can be manually or motor operated and is best suited for applications where corrosive elements exist in fume or vapor form.

Advantages of Fiberglass Construction:

– Superior corrosion resistance
– Excellent dimensional stability – It will not become brittle at low temperatures and at 0°F, laminated fiberglass will be stronger than at room temperature
– Strength-to-weight ratio 43% greater than that of aluminum

Features:

- **FRP Construction –** All parts are constructed of fiberglass and Isophthalic vinyl resin with a Class I flame spread rate of 25 or less and utilize woven fiberglass mat material for superior strength. All surfaces are protected for ultra-violet resistance. Joints are bonded with an industrial grade epoxy adhesive, having similar corrosion resistant properties as a vinyl resin. Please refer to the Corrosion Resistance Guide on page 79 for topcoat resin applications for additional corrosion resistance.
- **Sizes –** Available in standard and custom sizes
- **Temperature –** Suitable for temperatures up to 200°F
- **Maximum Face Velocity –** 2,500 FPM
- **Maximum Differential Pressure** – 1" W.G.
- **Maximum Panel Size –** 48" W x 48" H. Larger size units are available in multiple panel construction with special reinforced manufacturing techniques.
- **Minimum Panel Size –** 12" W x 12" H
- **Frame –** 4" x $^{11}/_{16}$" x $^{1}/_{8}$" fiberglass reinforced vinyl
- **Blades –** Minimum .070" thick fiberglass reinforced vinyl
- **Stops –** $^{1}/_{8}$" fiberglass reinforced vinyl angle
- **Axles –** $^{3}/_{4}$" diameter fiberglass reinforced vinyl rod
- **Bearings –** Fiber reinforced thermoplastic
- **Color –** Medium gray is standard. Other colors available upon request.
- **Mounting Configurations –** Available in duct & flange mount configurations.

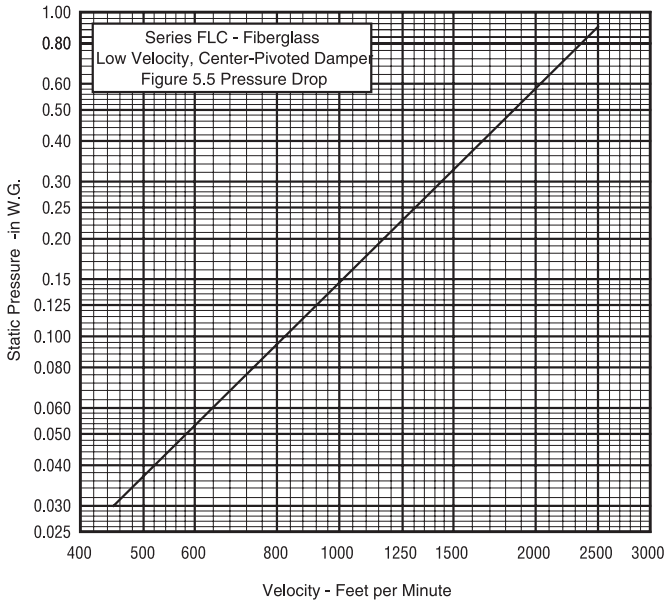
Options & Accessories

Refer to pages listed below for details.

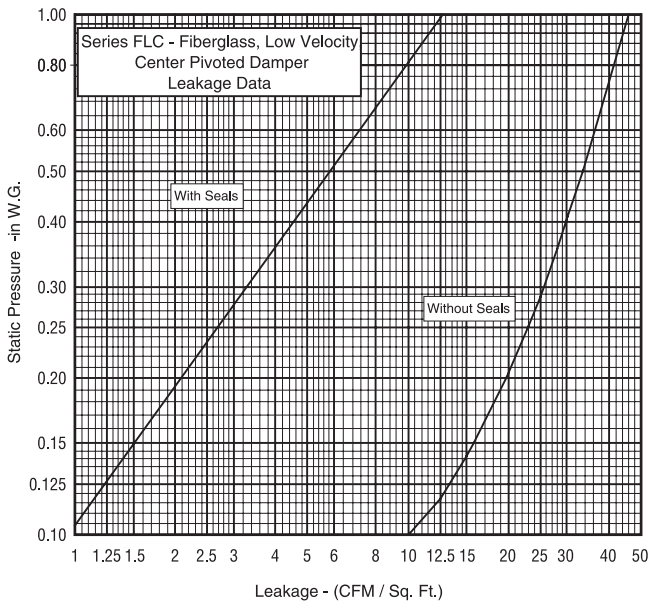
Ratings for Air Performance & Leakage

Hartzell Air Movement certifies that the Series FLC Fiberglass Low Velocity, Center-Pivoted Damper air performance and leakage ratings shown herein are reliable and accurate and in accordance with industry standards. Ratings are based on tests and procedures performed in accordance with AMCA Standard 500.

Performance Data

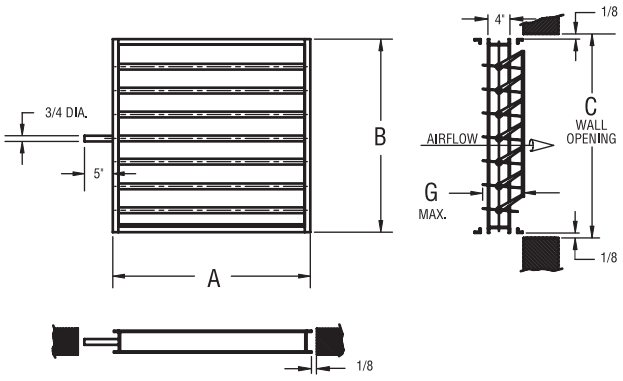


Leakage



Dimensions: Series FLC

Duct Mount

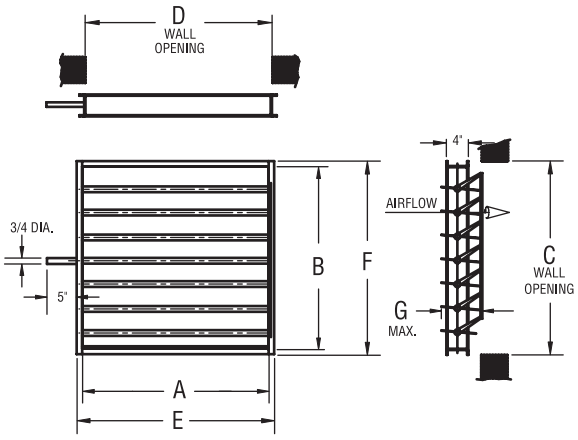


Warning: Allowances must be considered to eliminate side axle interference.

Duct Mount Dimensions (in.) – Series FLC

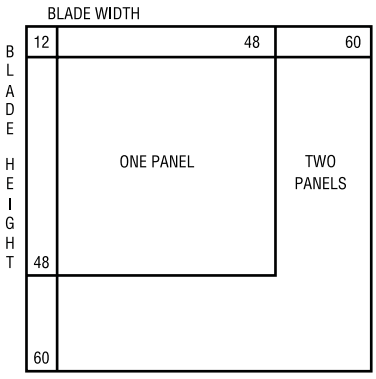
Nominal Damper Size	A	B	C	G
12	12	12	12 1/4	6 1/4
14	14	14	14 1/4	6 1/4
16	16	16	16 1/4	6 1/4
18	18	18	18 1/4	6 1/4
20	20	20	20 1/4	6 1/4
22	22	22	22 1/4	6 1/4
24	24	24	24 1/4	6 1/4
26	26	26	26 1/4	6 1/4
28	28	28	28 1/4	6 1/4
30	30	30	30 1/4	6 1/4
32	32	32	32 1/4	6 1/4
36	36	36	36 1/4	9 5/8
40	40	40	40 1/4	9 5/8
42	42	42	42 1/4	9 5/8
44	44	44	44 1/4	9 5/8
48	48	48	48 1/4	9 5/8
54	54	54	54 1/4	9 5/8
60	60	60	60 1/4	9 5/8

Flange Mount



Flange Mount Dimensions (in.) – Series FLC

Nominal Damper Size	A	B	C	D	E	F	G
12	12	12	12 1/4	12 1/4	14 1/8	14 1/8	6 1/4
14	14	14	14 1/4	14 1/4	16 1/8	16 1/8	6 1/4
16	16	16	16 1/4	16 1/4	18 1/8	18 1/8	6 1/4
18	18	18	18 1/4	18 1/4	20 1/8	20 1/8	6 1/4
20	20	20	20 1/4	20 1/4	22 1/8	22 1/8	6 1/4
22	22	22	22 1/4	22 1/4	24 1/8	24 1/8	6 1/4
24	24	24	24 1/4	24 1/4	26 1/8	26 1/8	6 1/4
26	26	26	26 1/4	26 1/4	28 1/8	28 1/8	6 1/4
28	28	28	28 1/4	28 1/4	30 1/8	30 1/8	6 1/4
30	30	30	30 1/4	30 1/4	32 1/8	32 1/8	6 1/4
32	32	32	32 1/4	32 1/4	34 1/8	34 1/8	6 1/4
36	36	36	36 1/4	36 1/4	38 1/8	38 1/8	9 5/8
40	40	40	40 1/4	40 1/4	42 1/8	42 1/8	9 5/8
42	42	42	42 1/4	42 1/4	44 1/8	44 1/8	9 5/8
44	44	44	44 1/4	44 1/4	46 1/8	46 1/8	9 5/8
48	48	48	48 1/4	48 1/4	50 1/8	50 1/8	9 5/8
54	54	54	54 1/4	54 1/4	56 1/8	56 1/8	9 5/8
60	60	60	60 1/4	60 1/4	62 1/8	62 1/8	9 5/8



Multiple Panel Units

For units larger than the 48” W x 48” H max. panel size

Multiple panels are fastened together with FRP strips adhered to the channel frame. Axles are 3/4” diameter FRP. For units up to 36”, axles are 4” long each end. For units above 36”, axles are full blade length.

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

Series FCO
Opposed Blade

Series FCP
Parallel Blade

Series FCO & FCP

Fiberglass Center-Pivoted Volume Control Dampers

Constructed entirely of fiberglass, the Series FCO & FCP Fiberglass Center-Pivoted Volume Control Dampers are recommended for system balance, back flow prevention and/or fan isolation applications used in conjunction with medium to high pressure process ventilation or fume exhaust systems. Series FCO is opposed blade and Series FCP is parallel blade. Both units can be manually or motor operated and are best suited for applications where corrosive elements exist in fume or vapor form.

Advantages of Fiberglass Construction:

– Superior corrosion resistance
– Excellent dimensional stability – It will not become brittle at low temperatures and at 0°F, laminated fiberglass will be stronger than at room temperature
– Strength-to-weight ratio 43% greater than that of aluminum

Options & Accessories

Refer to pages listed below for details.

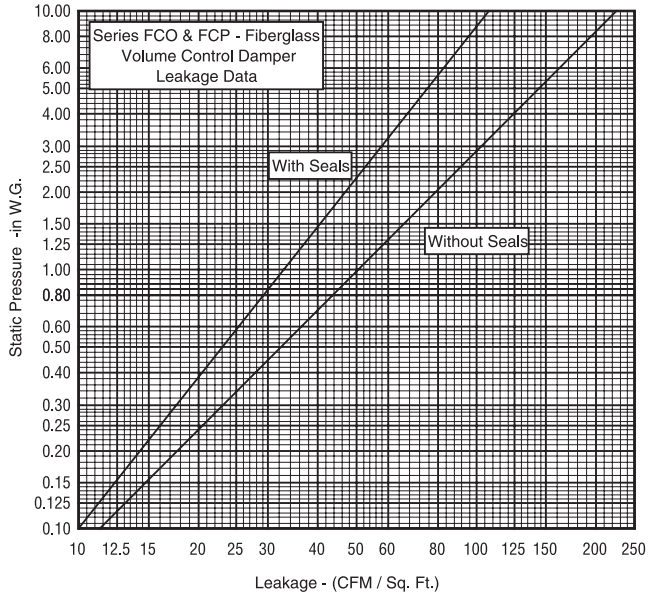
Ratings for Air Performance & Leakage

Hartzell Air Movement certifies that the Series FCO & FCP Fiberglass Volume Control Dampers air performance and leakage ratings shown herein are reliable and accurate and in accordance with industry standards. Ratings are based on tests and procedures performed in accordance with AMCA Standard 500.

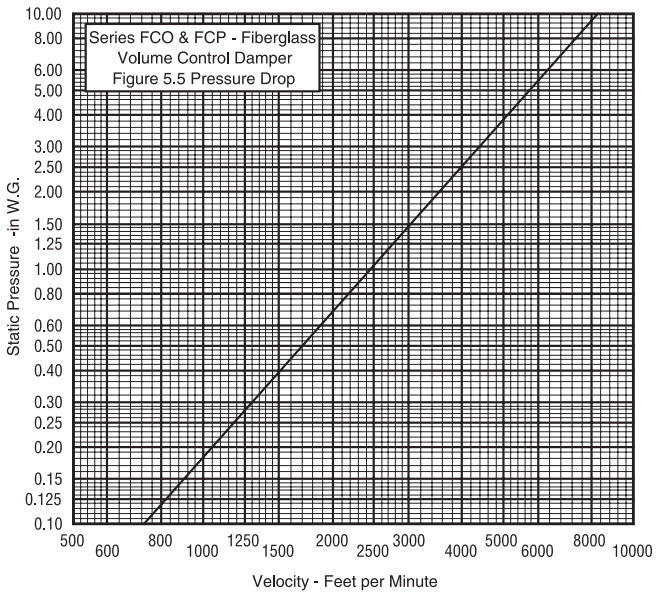
Features:

- **FRP Construction –** All parts are constructed of fiberglass and Isophthalic vinyl resin with a Class I flame spread rate of 25 or less and utilize woven fiberglass mat material for superior strength. All surfaces are protected for ultra-violet resistance. Joints are bonded with an industrial grade epoxy adhesive, having similar corrosion resistant properties as a vinyl resin. Please refer to the Corrosion Resistance Guide on page 79 for topcoat resin applications for additional corrosion resistance.
- **Sizes –** Available in standard and custom sizes
- **Temperature –** Suitable for temperatures up to 200°F
- **Maximum Face Velocity –** 6,000 FPM
- **Maximum Differential Pressure** – 20" W.G.
- **Maximum Panel Size –** Maximum single panel size is determined by the system static pressure. At high pressures, multi-panel may be required. Refer to the "Damper Maximum Blade Length vs. Static Pressure" illustration.
- **Frame –** 8" x $2^{11}/_{16}$" x $^{3}/_{16}$" fiberglass reinforced vinyl
- **Blades –** Minimum $^{3}/_{16}$" thick fiberglass reinforced vinyl
- **Linkage –** Stainless steel enclosed in damper frame, outside of airstream
- **Operation –** Control shaft may be located on either side, with options.
- **Stops –** $^{1}/_{8}$" fiberglass reinforced vinyl angle
- **Axles –** $^{3}/_{4}$" diameter fiberglass reinforced vinyl rod
- **Bearings –** Fiber reinforced thermoplastic
- **Color –** Medium gray is standard. Other colors available upon request.

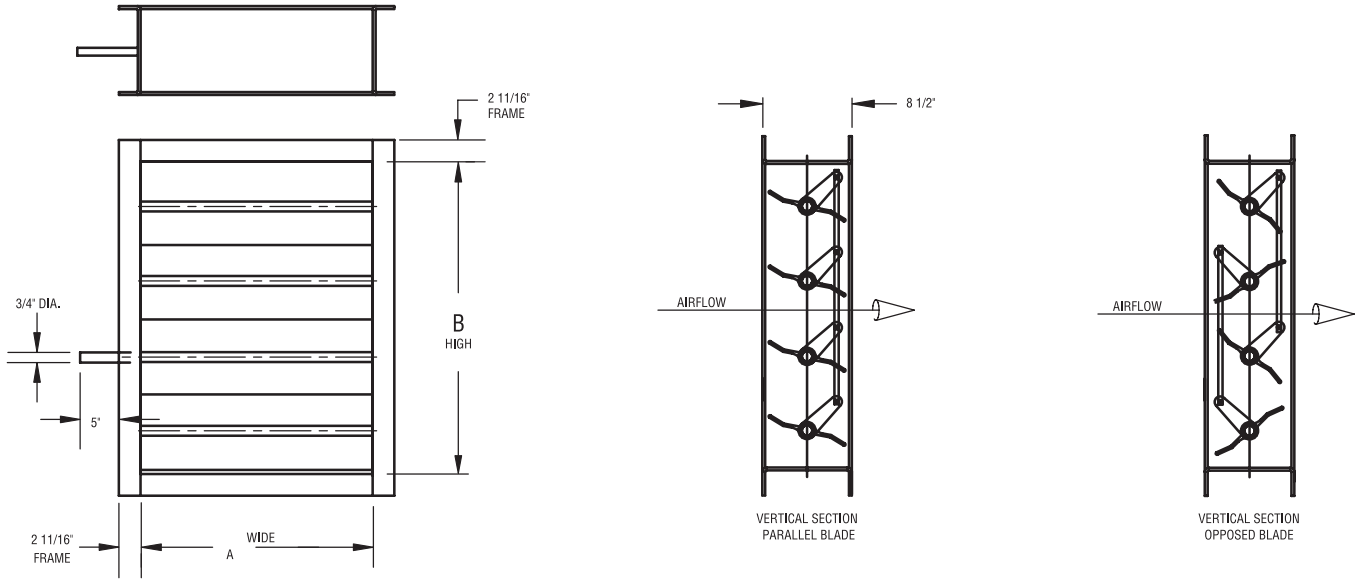
Leakage



Performance Data

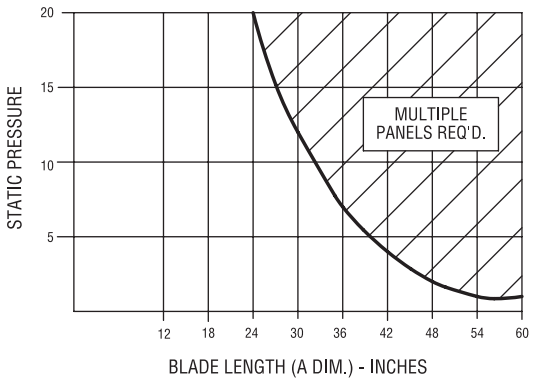


Dimensions: Series FCO & FCP



Dimensions A and B to match customer requirements

Damper Maximum Blade Length Vs. Static Pressure



Maximum panel size is determined by the system static pressure

The chart indicates maximum blade length as a function of system static pressure. When, at a given pressure condition, longer blades are required, jack-shafted, multi-panel construction shall be used. In those cases additional detail will be supplied on special factory drawings.

Damper Operational Torque

in.–lbs.

Size (in.)	12	18	24	30	36	42	48	54	60
12	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0
18	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	12.0
24	3.2	4.8	6.4	8.0	9.6	11.2	12.8	14.4	15.9
30	4.0	6.0	8.0	10.0	12.0	14.0	15.9	17.9	19.9
36	4.8	7.2	9.6	12.0	14.4	16.8	19.1	21.5	23.9
42	5.6	8.4	11.2	14.0	16.8	19.5	22.3	25.1	27.9
48	6.4	9.6	12.8	15.9	19.1	22.3	25.5	28.7	31.9
54	7.2	10.8	14.4	17.9	21.5	25.1	28.7	32.3	35.9
60	8.0	12.0	15.9	19.9	23.9	27.9	31.9	35.9	39.9

Notes:

1. Table equals pressure torque in inch-pounds, at 1" differential static pressure.
2. For torque at different pressures, multiply differential pressure by tabulated values.
3. For torque values with jamb seals, multiply tabulated values by 1.36.

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

Options and Accessories

Abrasive/Erosive Resistant Coating

HartKoate is an abrasive/erosive resistant coating developed by Hartzell Air Movement for application in environments where abrasive/erosive conditions may exist. HartKoate helps prevent premature deterioration of equipment in environments where uncoated fans may fail.

HartKoate is applied to a 50-60 mil thickness suitable for temperatures to 200°F.

HartKoate is particularly appropriate for use when water mist and/or abrasive particles exist in the airstream.

Contact your Hartzell representative for further details concerning the application of HartKoate coating to fiberglass fans in corrosive atmospheres.

Hi-Cor Construction

All airstream surfaces exposed to corrosive environment will be protected with a layer of Synthetic (Nexus) surfacing veil. An additional final coat of resin will be applied for extra corrosion resistance.

When Hi-Cor construction is required, the factory should be consulted concerning the corrosive environment involved.

Electrostatically Grounded

For applications in which fiberglass products are handling gas fumes that are not only corrosive but also potentially explosive, the equipment should be specially constructed to control and remove static electricity. Interior airstream surfaces can be coated with a "carbon rich" resin coat.

Grounding straps are secured from the side of the frame. All that remains to effectively ground the part is to ground the frame at the time of installation.

Insect Screen

Stainless steel screen.

Fiberglass Bird Screen

Fiberglass screen with larger openings than insect screen.

Fiberglass Mounting Angle

Facilitates mounting in the wall.

Blade Seals

Minimizes leakage at the blade overlaps.

Jamb Seals

Minimizes leakage at the blade ends.

Inlet and Outlet Guards

Inlet and outlet guards are available for fiberglass dampers and louvers. OSHA approved. Available in stainless steel, epoxy coated steel or fiberglass construction.

Manual Operators and Locking Quadrants

Available mounted to control dampers.

Motor Operators and Actuators

Available in electric or pneumatic with options per customer specifications.

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

Series FFL Fiberglass Louver at a Wastewater Treatment Plant

Corrosion Resistance Guide

Temperature values shown are for immersion or condensate contact applications. Where temperature values are shown, resin is suitable for hood and duct type applications for the full operating temperature range of the product. See product specifications for materials of construction and maximum operating temperature limits.

							FIBERGLASS***			COATINGS			
	Aluminum	Stainless 304	Stainless 316	Carbon Steel	Monel	Neoprene	Interplastics 8441	Hetron FR992	Derakane 510A / 510B	Epoxy (250°F)	Inorganic Zinc (150°F)	Coal Tar Epoxy (300°F)	Plasite 7122L (HAR, TFE)
Acetic Acid, to 10% (Fumes Only)	G	G	G	F	F	G	210	210	210	G	NR	G	F
Acetone (Fumes Only)	G	G	G	G	G	F	NR	180	180	G	G	-	F
Alcohol - Ethyl (15%)	G	G	G	G	F	G	150	150	80	G	G	-	F
Aluminum Acetate	F	G	G	-	F	F	-	-	-	G	NR	-	F
Aluminum Hydroxide	G	G	G	G	NR	G	180	180	180	G	NR	-	F
Aluminum Sulphate	G	F	G	G	F	G	210	210	210	G	NR	-	G
Ammonia (Dry - 1%)	G	G	G	G	NR	G	100	100	100	G	NR	G	G
Ammonia (Moist - 1%)	F	G	G	G	NR	G	150	100	NR	G	NR	-	F
Ammonium Chloride	NR	F	F	NR	F	G	*210	*210	*210	G	NR	G	G
Ammonium Hydroxide to 5%	F	G	G	F	NR	G	180S	180S	180S	G	NR	G(10)	F
Ammonium Nitrate	G	G	G	NR	NR	F	210	210	220	G	NR	G(30)	G
Ammonium Perchlorate	G	G	G	-	-	-	-	-	-	NR	-	-	G
Ammonium Persulfate (Saturated)	F	G	G	G	NR	G	180	180	180	NR	-	-	G
Ammonium Phosphate	G	G	G	NR	F	G	210	210	210	G	-	-	G
Ammonium Sulphate	NR	G	G	F	F	G	100	210	220	F	-	G(10)	G
Ammonium Sulphite	NR	G	G	-	NR	-	100	100	150	G	-	-	G
Barium Chloride	NR	G	G	F	F	G	210	210	210	G	-	-	G
Barium Hydroxide	NR	-	G	F	-	G	150	150	150	G	NR	-	G
Barium Nitrate	G	G	G	G	NR	G	-	-	-	F	-	-	G
Barium Sulphate	G	G	G	G	F	G	210	210	210	F	-	-	G
Benzene	G	G	G	F	G	NR	90	NR	NR	G	-	-	G
Benzoic Acid	G	G	G	-	F	NR	210	210	210	G	G	-	G
Boric Acid (5%)	G	G	G	F	F	G	-	210	210	G	NR	-	G
Bromine, Wet Gas	NR	NR	NR	NR	NR	F	-	*90	NR	G	NR	G	F
Butyric Acid, to 50%	G	G	G	-	F	NR	210	160	210	NR	-	-	G
Calcium Carbonate	F	G	G	G	F	G	180S	180S	180S	G	-	-	G
Calcium Chlorate	-	G	G	-	F	G	210	210	220	G	-	-	F
Calcium Chloride	F	F	F	F	F	G	210	210	220	G	NR	-	G
Calcium Hydroxide	F	G	G	F	F	G	180S	-	180S	G	NR	-	F
Carbolic Acid	G	G	G	NR	F	NR	NR	-	NR	NR	-	G(5)	NR
Carbon Monoxide Gas	G	G	G	-	NR	G	200	210	250	G	-	-	G
Carbon Tetrachloride	G	G	G	NR	G	NR	100	150	150	G	F	G	G
Chlorine Gas (Dry)	F	F	F	NR	G	F	*210S	*180S	*220S	F	NR	-	F
Chlorine Gas (Moist)	NR	NR	NR	NR	NR	NR	180S	180S	*220S	F	NR	-	NR
Chlorine Water	NR	-	-	NR	NR	NR	*180	*180	*200	G	NR	G	F
Chlorobenzene	G	G	G	F	G	NR	NR	NR	NR	F	F	-	F
Chromic Acid, to 5%	F	F	G	NR	NR	NR	150	100	150	G(20)	NR	NR	F
Citric Acid	F	G	G	NR	F	G	*210	*210	*210	G	NR	G	F
Copper Acetate	NR	G	G	NR	NR	F	-	160	-	G	-	-	F
Copper Chloride	NR	NR	NR	NR	NR	G	*210	*210	*220	G	-	-	G
Copper Cyanide	NR	G	G	NR	NR	G	210	210	210	G	-	-	F
Copper Nitrate	NR	G	G	NR	NR	G	210	210	210	F	-	-	F
Copper Sulphate	NR	G	G	NR	NR	G	210	210	210	F	-	-	G
Detergents	G	F	F	G	-	F	210	100	150	G	-	G	G
Ethyl Chloride	F	G	G	NR	F	NR	NR	NR	NR	G	F	-	NR
Ethylene Chloride	F	G	G	NR	-	NR	NR	NR	NR	G	F	-	NR
Ferric Nitrate	NR	G	G	-	NR	G	210	210	210	F	-	-	-
Ferric Sulphate	NR	F	F	NR	F	G	210	210	210	F	-	-	-
Ferrous Sulphate	G	F	G	NR	F	G	210	210	210	F	-	-	G
Fluoboric Acid	NR	NR	F	NR	-	G	-	180S	210S	NR	-	-	F
Formalin Formaldehyde	G	G	G	G	G	NR	-	-	150	G(20)	NR	G	F
Formic Acid, to 10%	F	G	G	NR	F	G	180	180	180	NR	NR	-	F
Furfural, to 10%	G	G	G	G	F	F	-	120	NR	F	NR	-	F
Gallic Acid	G	G	G	NR	F	F	-	-	-	F	-	-	-
Gasoline	G	G	G	G	G	F	180	-	120	G	G	G	G
Hydrobromic Acid, to 25%	NR	NR	NR	NR	NR	NR	*180	*200	*180	NR	NR	-	-
Hydrochloric Acid, to 15%	NR	NR	NR	NR	F	G	*180S	*210S	*210S	NR	NR	G	F
Hypochlorous Acid	NR	NR	NR	NR	-	-	180	90	100	NR	-	-	-
Hydrocyanic Acid, to 10%	G	G	G	F	-	G	180	150	210	NR	-	-	F
Hydrofluosilicic Acid, to 10%	NR	NR	NR	-	F	F	*150S	*150S	*180S	NR	-	-	G
Hydrofluoric Acid, to 10%	NR	NR	NR	NR	G	G	*130S	*100S	*150S	NR	NR	-	NR
Hydrogen Peroxide, to 30%	G	G	G	NR	F	F	150	100	150	G	NR	G	F
Hydrogen Sulfide, to 5%	NR	F	G	G	NR	G	180	210	180	F	NR	G	F
Lactic Acid	F	F	G	NR	NR	G	*210	*210	*210	NR	NR	-	G
Magnesium Carbonate	F	G	G	-	F	G	180	180	180	G	-	-	-
Magnesium Chloride	NR	F	G	F	G	G	210	210	210	G	NR	-	G
Magnesium Nitrate	G	G	G	-	F	G	-	160	210	F	-	-	-
Magnesium Oxychloride	NR	NR	NR	-	-	-	-	-	-	NR	-	-	-
Maleic Acid	G	G	G	G	F	NR	210	180	210	NR	-	-	G
Manganese Carbonate	F	G	G	-	F	-	180	-	-	G	-	-	-
Mercurous Nitrate	NR	G	G	-	NR	-	-	-	-	F	-	-	F
							FIBERGLASS***			COATINGS			

	Aluminum	Stainless 304	Stainless 316	Carbon Steel	Monel	Neoprene	Interplastics 8441	Hetron FR992	Derakane 510A / 510B	Epoxy (250°F)	Inorganic Zinc (150°F)	Coal Tar Epoxy (300°F)	Plasite 7122L (HAR, TFE)
Methyl Ethyl Ketone, to 10%	NR	G	G	G	F	NR	NR	NR	NR	NR	F	-	F
Methylene Chloride	G	G	G	G	F	NR	180	180	180	G	G	G	G
Naphtha	NR	NR	NR	-	-	NR	-	-	-	NR	-	-	G
Napthalensulfonic Acid	NR	F	F	NR	F	F	180	210	210	G	-	-	G
Nickel Chloride	NR	G	G	NR	NR	-	180	210	210	F	-	-	-
Nickel Nitrate	NR	F	F	NR	F	G	180	210	210	F	-	-	-
Nickel Sulphate	NR	G	G	NR	NR	F	150	160	150	NR	NR	F	F
Nitric Acid, to 5%	F	G	G	-	NR	NR	-	-	-	NR	-	-	F
Nitrous Acid	G	G	G	F	G	F	210	200	210	G	NR	-	G
Oleic Acid	NR	G	G	NR	F	F	*210	*220	*120	G	NR	G(20)	G
Oxalic Acid, to 10%							NR	NR	NR				
Ozone	NR	NR	NR	NR	G	F	150	150	150	NR	NR	-	F
Perchloric Acid, to 10%**	G	G	G	NR	F	-	NR	-	NR	G(10)	F	-	NR
Phenol, to 10%	NR	G	G	NR	F	F	*210S	*210S	*210S	NR	NR	NR	F
Phosphoric Acid, to 10%	G	G	G	-	-	F	-	-	-	F	-	-	-
Phosphoric Anhydride	G	G	G	NR	NR	G	100	-	NR	NR	-	-	F
Picric Acid, to 10%	F	G	G	NR	F	G	160	160	-	G	-	-	G
Potassium Bromide	G	G	G	G	F	G	210	210	210	G	-	-	G
Potassium Chloride	F	G	G	G	F	G	NR	-	-	F	-	-	G
Potassium Cyanide	NR	G	G	G	F	G	-	-	-	F	NR	-	-
Potassium Dichromate	G	G	G	F	F	G	210	210	210	F	-	-	-
Potassium Ferricyanide	G	G	G	-	F	G	210	210	210	G	-	-	G
Potassium Ferrocyanide	G	G	G	F	F	G	210	210	210	G	-	-	-
Potassium Hydroxide, to 25%	NR	G	G	G	G	G	-	150S	150S	G	NR	G	G
Potassium Hypochlorite	NR	NR	NR	-	NR	-	-	-	-	G	-	-	-
Potassium Nitrate	G	G	G	G	F	G	210	210	210	G	-	-	G
Potassium Permanganate	G	G	G	G	F	-	210	210	210	F	-	G(5)	-
Potassium Sulphate	F	G	G	G	G	G	210	210	210	G	-	-	F
Pyrogallic Acid	G	G	G	G	F	-	-	-	-	F	-	-	-
Salt Spray	F	G	G	NR	G	G	200	-	210	G	G	G	G
Silver Bromide	NR	F	G	-	F	-	-	-	-	G	-	-	-
Silver Nitrate	NR	G	G	NR	NR	G	210	210	210	G	-	-	F
Sodium Acetate	G	G	G	F	G	F	210	210	210	G	NR	-	-
Sodium Bisulfate	F	G	G	NR	F	F	210	210	210	G	-	-	G
Sodium Borate	F	G	G	F	F	F	160	210	210	G	NR	-	-
Sodium Carbonate, to 35%	NR	G	G	G	G	G	160S	160S	180S	G	NR	-	G
Sodium Chlorate	F	G	G	F	G	G	210	210	210	NR	NR	-	G
Sodium Chloride	F	F	G	F	G	G	210	210	180	G(30)	NR	G	G
Sodium Citrate	NR	G	G	-	-	-	210	-	-	F	-	-	G
Sodium Dichromate	G	-	-	G	-	F	210	210	210	F	NR	-	-
Sodium Ferricyanide	G	G	G	-	F	-	210	210	210	G	-	-	-
Sodium Fluoride	F	G	G	NR	G	NR	180S	180S	180S	F	-	-	-
Sodium HyDroxide, to 10%	NR	G	G	G	G	G	150S	160S	180S	G	NR	G	F
Sodium Hypochlorite, to 15%	NR	F	F	NR	NR	G	180S	150S	180S	F	NR	G(5)	F
Sodium Hyposulfite	NR	G	G	-	F	-	-	-	-	F	-	-	-
Sodium Nitrate	G	G	G	G	F	F	210	210	210	F	-	-	G
Sodium Nitrite	G	G	G	-	F	-	210	210	-	F	-	-	G
Sodium Perchlorate, to 10%	G	G	G	-	-	-	-	-	-	NR	-	-	-
Sodium Peroxide	F	G	G	F	F	G	-	-	-	F	-	-	-
Sodium Phosphate	NR	G	G	-	G	F	180	-	210	G	-	G(10)	F
Sodium Salicylate	NR	-	G	-	-	-	210	-	-	G	-	-	F
Sodium Silicate	F	G	G	G	F	G	210S	210	-	G	NR	-	G
Sodium Sulfate	F	G	G	G	G	G	210	210	210	F	NR	-	F
Sodium Sulfite	F	G	G	-	F	G	210	210	210	F	NR	-	G
Sodium Sulfide	NR	G	G	G	F	G	210S	210S	210S	G	NR	-	G
Stannic Chloride	NR	NR	NR	NR	NR	F	*210	*180	*210	NR	-	-	-
Stannous Chloride	NR	F	F	NR	F	G	*210	*210	*210	F	-	-	G
Steam Vapor	G	G	G	G	G	G	200	200	180	F	-	-	NR
Stearic Acid	G	G	G	F	F	F	210	210	210	G	NR	-	G
Strontium Hydroxide	NR	G	G	-	-	-	-	-	-	G	-	-	-
Strontium Nitrate	NR	G	G	-	G	-	-	-	-	F	-	-	-
Sulfur Dioxide Gas	G	G	G	G	NR	G	210	250	210	NR	NR	-	G
Sulfuric Acid, to 25%	NR	NR	NR	NR	F	G	*200	*150	*210	NR	NR	G	F
Sulfurous Acid, to 10%	F	F	F	NR	NR	NR	100	100	120	NR	NR	-	F
Tannic Acid	F	G	G	F	F	G	210	210	210	G(50)	NR	G	G
Tartaric Acid	F	G	G	NR	F	G	210	210	210	G	NR	-	F
Trichlorethylene	F	G	G	G	G	NR	NR	NR	NR	NR	F	-	F
Water (Moisture)	G	G	G	NR	G	G	180	180	200	G	G	G	G
Xylol-Toluol	G	G	G	G	-	NR	-	-	80	G	G	G	G
Zinc Chloride	NR	G	G	NR	F	G	-	*210	*210	G	-	-	G
Zinc Cyanide (Moist)	NR	G	G	-	-	-	160	160	-	G	-	-	-
Zinc Nitrate	F	G	G	-	-	-	210	210	210	F	-	-	-
Zinc Sulfate	F	G	G	NR	F	G	210	210	210	F	-	-	-

NOTES: * Special shaft and hardware required, contact factory.
** Special design considerations required (explosive environment), contact factory.
*** Temperature values shown for fiberglass resins are for immersion or condensate contact applications.

KEY: G = GOOD F = FAIR NR = NOT RECOMMENDED
H&D = SUITABILITY FOR HOOD & DUCT APPLICATIONS AT AMBIENT CONDITIONS ONLY

Temperature/Altitude Correction

Performance tables are based on standard air conditions (sea level, 70°F, and 29.92 inches barometric pressure) giving an air density of .075 lbs. per cubic foot. The specific gravity of air equals 1.00 at these conditions. For an application where the fan operates at other than standard conditions (temperature, altitude, or both), correction factors must be applied to the selection of the fan. In addition, the standard construction of the fan must be modified.

Table 1 shows temperature and altitude correction factors. When a fan operates at other than standard conditions, correction factors are required to correct static pressure and horsepower.

Table 2 shows the maximum safe operating speeds for each size propeller. At high temperatures, these maximum safe operating speeds should be derated.

Table 3 shows maximum safe speed correction factors by temperature and material construction.

Table 1: Combined Altitude/Temperature Correction Factors

°F. TEMP \ ALT. FT.	0	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000
-50	0.77	0.80	0.83	0.86	0.89	0.92	0.96	1.00	1.04	1.08	1.12	1.16	1.21
-25	0.82	0.85	0.89	0.92	0.95	0.98	1.03	1.07	1.11	1.15	1.20	1.24	1.29
0	0.87	0.90	0.94	0.97	1.01	1.04	1.09	1.13	1.17	1.22	1.27	1.31	1.37
25	0.91	0.95	0.98	1.02	1.06	1.09	1.14	1.18	1.23	1.27	1.33	1.37	1.43
50	0.96	1.00	1.04	1.08	1.11	1.15	1.20	1.25	1.30	1.34	1.40	1.45	1.51
70	1.00	1.04	1.08	1.12	1.16	1.20	1.25	1.30	1.35	1.40	1.46	1.51	1.57
100	1.06	1.10	1.14	1.19	1.23	1.27	1.33	1.38	1.43	1.48	1.55	1.60	1.66
125	1.10	1.14	1.19	1.23	1.28	1.32	1.38	1.43	1.49	1.54	1.61	1.66	1.73
150	1.15	1.20	1.24	1.29	1.33	1.38	1.44	1.50	1.55	1.61	1.68	1.74	1.81
175	1.20	1.25	1.30	1.34	1.39	1.44	1.50	1.56	1.62	1.68	1.75	1.81	1.88
200	1.25	1.30	1.35	1.40	1.45	1.50	1.56	1.63	1.69	1.75	1.83	1.89	1.96

Note: Table 1 has inverted values. Actual density ratio is the reciprocal of the above values.

Reading the Chart

Temperatures above or below 70°F at seal level (0 ft.) are read vertically between the double lines giving the proper correction factors. Altitudes above sea level at a constant 70°F temperature are read horizontally between the double lines giving those factors. Any other factors are obtained by reading down to the desired temperature, then across to the desired altitude.

Table 2: Maximum Safe Speeds @ 70°F

Series 34	
Fan Size	Max. Speed (RPM)
12	4,275
16	3,240
18	2,890
20	2,605
24	2,185
28	1,875
32	1,645
36	1,465
40	1,320
44	1,200
48	1,100
54	835
60	755

Series 35	
Fan Size	Max. Speed (RPM)
12	4,215
16	3,205
18	3,270
24	2,475
28	2,130
32	1,870
36	1,665
44	1,365
48	1,255
54	1,115
60	1,000

Series 40		
Fan Size	100% Width	66% Width
12	4,520	5,320
15	3,600	4,340
22	2,440	2,950
27	2,000	2,410
33	1,670	2,020
40	1,370	1,660
49	1,130	1,360
60	920	1,110
Tip Speed	14,500 FPM	17,500 FPM

Series 41, 41P, 41U			
Fan Size	100% Width	66% Width	33% Width
12	4,520	5,320	
15	3,600	4,570	
18	2,990	3,790	
22	2,440	3,100	3,765
24	2,240	2,850	3,605
27	2,000	2,540	3,300
30	1,840	2,340	3,050
33	1,670	2,120	2,755
36	1,530	1,950	2,725
40	1,370	1,740	2,250
44	1,240	1,570	2,055
49	1,130	1,430	1,865
54	1,020	1,290	1,685
60	920	1,170	1,520

Maximum operating temperature: 200°F

Series 42	
Fan Size	Max. Speed
10	4,000
12	4,000
14	3,600

Max. Operating Temperature:
200°F (Arrangement 4)
250°F (Arrangement 10)

Series 43	
Fan Size	Max. Speed
16	3,667
19	2,995
23	2,532
26	2,193
30	1,934
33	1,736

Table 3: Max. Safe Speed Correction Factors*

Temp. (°F)	0	70	100	150	175	200	225	250
FRP	1.00	1.00	1.00	0.98	0.95	0.91	0.82	0.70

* To correct maximum safe operating speeds (Table 2) for high temperatures, multiply those speeds by correction factors from Table 3.

Use of Correction Factors and Tables

EXAMPLE: Assume the required performance to be 16,500 CFM, .75" SP, 175°F, and 3000 ft. altitude.

1. Table 1 gives us an altitude/temperature correction factor of 1.34.
2. .75" S.P. x 1.34 = 1.00 S.P. for 70°F at sea level.
3. A 36" Series 29 Direct Drive Duct Axial® Fan selected from the performance tables (see www.hartzellflow.com) for the new conditions shows 16,511 CFM, 1.00 S.P. at 1160 RPM with 4.36 BHP.
4. Correct the horsepower and pressure in Step 3 to non-standard performance by dividing by the correction factor:

   1.00" SP ÷ 1.34 = .75" S.P.
   4.36 BHP ÷ 1.34 = 3.25 BHP
5. Final performance of the direct drive Duct Axial® fan at the assumed conditions: 16,500 CFM, .75" SP, 1160 RPM, 3.25 BHP, 175°F, and 3000 ft. altitude.

Hartzell Model Code/Ordering Information

For all products, excluding Air Control Products

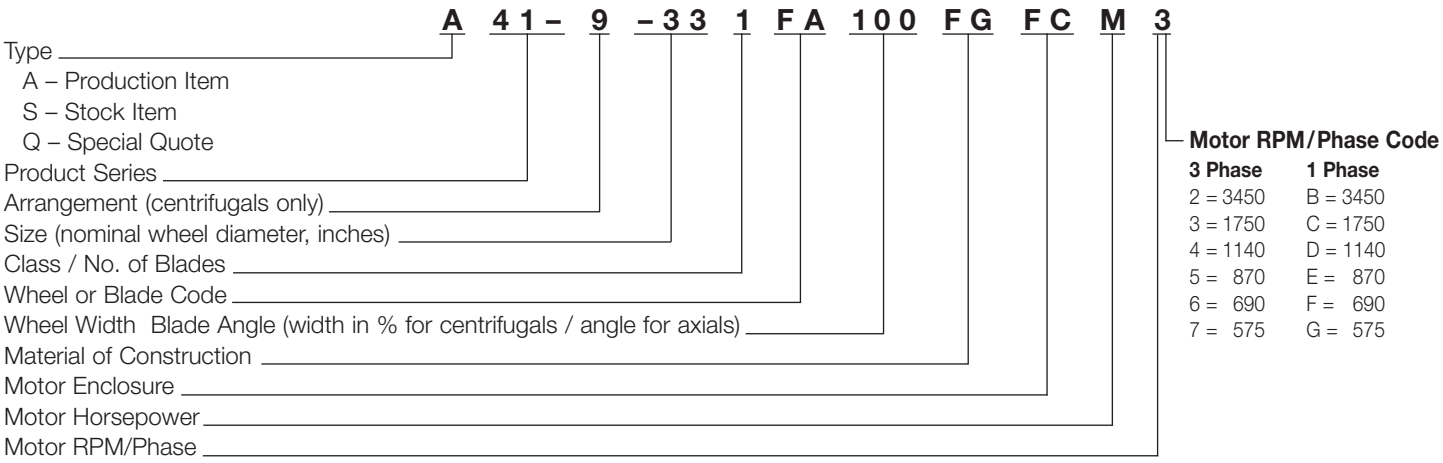
The Hartzell model code system is designed to aid customers in completely identifying the selected unit. Be sure to include all applicable information to ensure proper order placement. Informational fields that do not apply must be filled in with hyphens or dashes. Also include a list of any options and/or accessories.

The following model code demonstrates our coding system using the example at the bottom of the page.

Contact your local Hartzell Sales Representative for selection or ordering assistance – 800.336.3267.

Sample Model Code

Use this model code for all products in this catalog, with the exception of Fiberglass Air Control Products (Series FFL, FEP, FLC, FCO and FCP). A separate model code for those products can be found on the following page.



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

Example:

Assume a needed Fiberglass Backward Curved Centrifugal Fan with a performance of 12,000 CFM at 5" S.P., standard air.

Looking at the performance tables, we find that the 33" rating table for 100% width gives us a fan RPM of 1,168, a brake horsepower (BHP) of 12.3 and a required motor horsepower of 15.

The model code can be constructed as follows: Type will be a production item (code A), product series for the Fiberglass Backward Curved Centrifugal Fan is 41, arrangement is 9 (code 9), size of the wheel is 33", class of construction is I (code 1), wheel code for this item is FA, wheel width is 100% (code 100), material of construction is fiberglass (code FG), motor enclosure is totally enclosed fan cooled (code FC), motor horsepower is 15 (code O), and motor RPM/phase is 1750 (code 3).

Note: All other informational fields must be filled with hyphens or dashes (–) if they are not applicable to the fan being considered.

Hartzell Model Code/Ordering Information

For Fiberglass Air Control Products ONLY

The Hartzell model code system is designed to aid customers in completely identifying the selected unit. Be sure to include all applicable information to ensure proper order placement. Informational fields that do not apply must be filled in with hyphens or dashes. Also include a list of any options and/or accessories.

The following model code demonstrates our coding system using the example at the bottom of the page.

Contact your local Hartzell Sales Representative for selection or ordering assistance – 800.336.3267.

Sample Model Code

Use this model code for Fiberglass Air Control Products ONLY. (Series FFL, FEP, FLC, FCO and FCP).

A	FEP	D	-24	-	WX	-36	FG	--	-	-

- Type
  - A – Production Item
  - S – Stock Item
  - Q – Special Quote
- Product Series
- Mounting (D-Duct, F-Flange, A-Angle)
- Width in inches (Parallel to blades)
- Not Assigned
- WX (width by)
- Height in inches (Perpendicular to blades)
- Material of Construction
- Not Assigned
- Not Assigned
- Not Assigned

Example:

Assume a needed Fiberglass Automatic Shutter for 6,000 CFM for a duct size of 24" wide x 36" high. The shutter area will be 6 sq. ft. and the face velocity will be 1,000 FPM. Reading the performance curve for a Fiberglass End-Pivoted Automatic Shutter, Series FEP, we find the pressure loss through the shutter at 0.27" static pressure.

The model code can be constructed as follows: Type will be a production item (code A), product series for the Fiberglass End-Pivoted Automatic Shutter is FEP, duct mounting will be used (code D), Width is 24, Height is 36, material of construction is fiberglass (Code FG).

Note: All other informational fields must be filled with hyphens or dashes (–) if they are not applicable.

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Notes:

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