

VCR | Free Standing Centrifugal Fan

MOVING YOUR WAY

CERTIFIED RATINGS



PennBarry certifies that the VCR Backward Inclined and Airfoil Fans shown herein are licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.

FANSIZER®

Product Selection Software

FanSizer software allows you to select the best centrifugal or axial unit for your application. Input CFM and static pressure, and FanSizer will make the optimum selection. It allows you to complete job schedules which you can store, modify and print in seconds. Features include: on-line help, on-screen product drawings and dimensions, and complete text specifications. In addition, you can convert job schedules to ASCII code for use with other programs like word processing.

FANCAD®

Library of CAD Drawings

FanCad is a library of drawings for use with computer-aided design (CAD) systems. FanCad's pre-drawn details can save hours of drafting time. Included are all popular PennBarry fans and related items.

Visit Our Web Site

Point your internet web browser to www.PennBarry.com for up-to-the-minute information including:

- On-line catalog
- List of nearest PennBarry representatives
- What's New
- HVAC "Hot Links"

FanSizer and FanCad are registered trademarks.

Table of Contents

| | |
|---|-----|
| Introduction | 1 |
| General Information | 2 |
| Features and Benefits | 3 |
| Fan Arrangements | 4 |
| Options and Accessories | 6 |
| Dimensional Data | 9 |
| Centrifugal Fan Data | 11 |
| Performance Data | |
| Backward Inclined - Single Width Single Inlet | 20 |
| Backward Inclined - Double Width Double Inlet | 42 |
| Airfoil - Single Width Single Inlet | 63 |
| Airfoil - Double Width Double Inlet | 80 |
| Sound Power Levels | 97 |
| Engineering Notes | 107 |
| Sample Specifications | 113 |
| Limited Warranty | 114 |

©2005 PennBarry™ All rights reserved.

Following publication of this catalog changes may have been made in standard equipment, options and the like that would not be included.

We reserve the right to make changes at any time, without notice, to models, specifications, options, availability, etc.

This bulletin illustrates the appearance of PennBarry products at the time of publication and we reserve the right to make changes in design and construction at anytime without notice. Your local sales representative is the best source for current information.

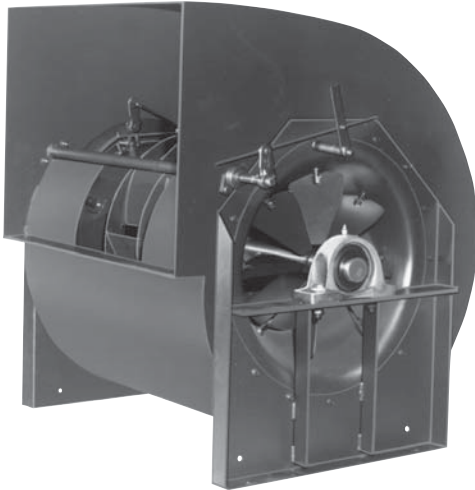
General Information

VCR Fan

PennBarry products are backed by extensive research and testing in an AMCA Accredited Laboratory. These tests assure the customer that PennBarry products are of the highest quality in design, construction and performance. Before leaving the plant, each fan is carefully subjected to a test at the field operating rpm. Dynamic balancing is performed by experienced personnel using electronic equipment to ensure smooth and trouble-free operation.

Commercial

The high volume capacities of the VCR backward inclined and VCR airfoil fans make them excellent for use in hotels, office buildings, manufacturing plants and hospitals. Variable inlet vanes and discharge dampers make it easy to adjust the airflow for the greatest comfort and efficiency.



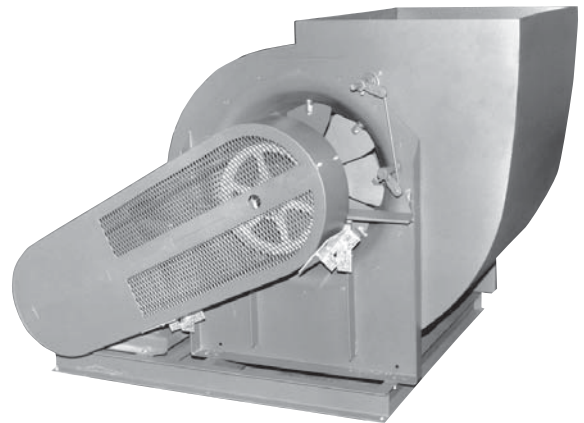
Arrangement 3 DWDI with Vanes

Industrial

PennBarry VCR backward inclined fans are heavy-duty and can handle a variety of atmospheric conditions including fumes, abrasives and high temperatures. Customers from industries as diverse as paper, automotive and textiles have found PennBarry backward inclined fans to be suited for their industrial process applications. Because of their high efficiencies and low sound power levels, these fans are recommended for clean air and lower temperatures only. A wide range of accessories are available to expand the versatility of both fans.

Original Equipment Manufacturers

High quality PennBarry component parts are offered for unitary HVAC and process equipment systems. Available in a variety of materials and wheel diameters, fans and parts can be specially constructed to meet the specifications of HVAC and process equipment. Backward inclined wheels are furnished in diameters from 10.5" to 89" and airfoil wheels are available in 18.25" to 89" diameters.



SWSI on Unitary Base with Variable Inlet Vanes and a Belt Guard

Quality is built into every PennBarry product

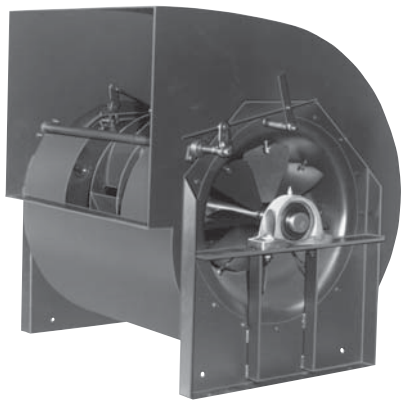
All PennBarry fans are ruggedly built for long, dependable service. VCR fans are no exception. VCR fans offer many construction features not found on other fans.

Housings

VCR housings use heavy-gauge steel, continuously welded to assure no air leakage. They are rigidly braced to prevent vibration and pulsation. Side bracing on most VCR fans is achieved by steel angle which is welded to the fan housing. Class I and II fans, size 660 and larger, and Class III and IV, size 542 and larger, are braced across the scroll with angle or channel. Housings on sizes 105 through 270 are field rotatable.

Bearing Pedestals

Bearing supports are rigid and properly braced to provide a firm foundation for the shaft and bearings. Bearing pedestals for Class I and II VCR fans in Arrangements 1, 9 and 10 through size 600 are the "open" design. The open pedestal weighs less without sacrificing structural integrity. Class I and II fans above size 600 and all Class III and IV fans have the traditional enclosed trapezoidal pedestal constructed of heavy steel plate.

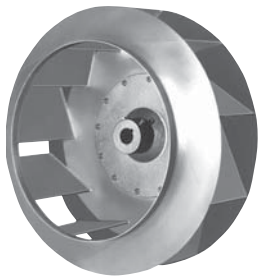


Arrangement 3 DWDI
with "Open" Bearing Pedestal Design

Wheels

VCR fans are available with backward inclined or airfoil wheels on a standard basis. Backward inclined (BI) and Airfoil (AF) type wheels are very efficient and non-overloading.

Backward inclined wheels are designed to provide optimum performance for most operating conditions. The solid, single thickness blades are firmly attached to the backplate using welds. A spun wheel cone is then welded to the blades. The wheel cone is matched to the inlet cone providing the exact overlap to maximize the fan's efficiency. The double width wheel is constructed as one integral assembly.



Single Width
Backward Inclined Wheel

Backward inclined wheels are available in diameters from 10.5" through 89" for air volumes up to

464,000 cfm and static pressure up to 18" W.G. The maximum operating temperature is 1000°F. Standard construction

material is mild steel, but wheels can also be manufactured in aluminum, abrasion resistant steel, stainless steel, Corten and other materials.

Airfoil wheels provide the highest efficiency of all centrifugal fan designs. The blades are die cut and carefully formed to provide aerodynamically efficient airflow into the fan. Double width wheels are constructed as one assembly.

Airfoil wheels can be provided in wheel diameters ranging from 18.25" through 89" for air volumes up to 460,000 cfm and static pressures up to 18" W.G. The maximum operating temperature is 750°F. Mild steel is the standard construction material with aluminum and stainless steel wheels available upon request.

Shafts

Only the finest turned, ground and polished shafting is used in PennBarry VCR fans. First critical shaft speed on Class I and II fans is at least 125% of the fan's maximum operating speed. For all Class III and IV fans the first critical speed is at least 142% of the originally specified operating speed.

Bearings

VCR fans are equipped with heavy-duty, self-aligning pillowblock bearings from the most respected American manufacturers. The most commonly supplied types are single row ball bearings in a one-piece cast iron pillowblock (shown at left), double row spherical roller bearings in a one-piece cast iron pillowblock, and double row spherical roller bearings in a two-piece split pillowblock.



Single Row Ball Bearing

The standard L_{10} bearing life on Class I and II VCR fans is 20,000 hours; optional bearings are available that increase the L_{10} life to 40,000 hours and 80,000 hours. Standard L_{10} bearing life in Class III and IV VCR fans is 40,000 hours, and 80,000 hour bearings are optional.

Balancing

All PennBarry fans are statically and dynamically balanced using precision instruments to guarantee minimum vibration during operation. Each wheel is individually balanced and a final balance test is performed on the completed fan assembly. Before shipment the exact vibration for the entire assembly is recorded on the fan as proof of the final dynamic balance at the factory.

Fan Arrangements

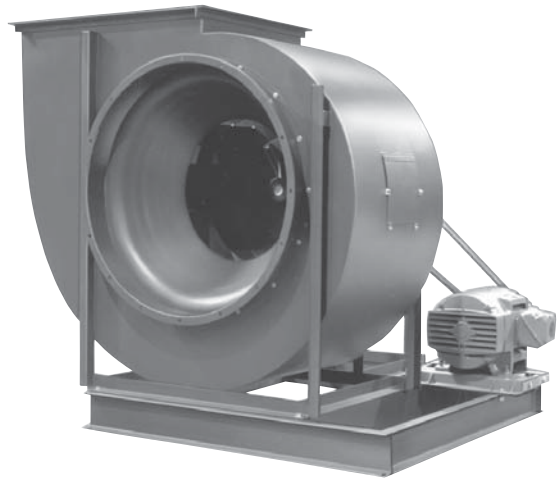
VCR Fan

Arrangement 1

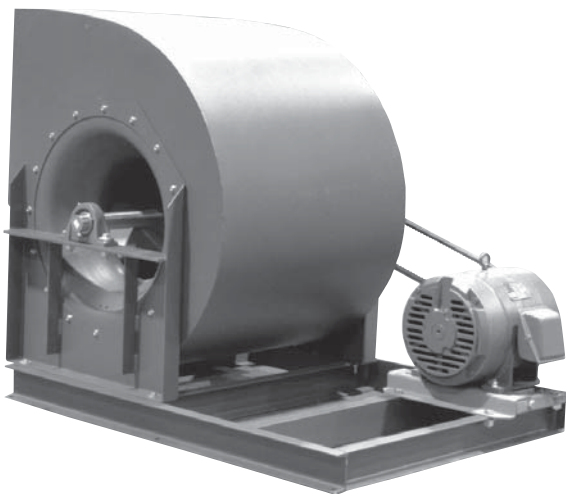
This arrangement is popular for industrial applications and for applications where single width fans are required. Two bearings are mounted on a sturdy pedestal and the fan wheel is overhung into the housing. With appropriate accessories, this fan can handle temperatures up to 1000°F with the backward inclined wheel. Arrangement 1 is suitable for either belt drive or direct drive. It is available for all class VCR fans and all sizes except 105.

Arrangement 3 SWSI

This arrangement is most often used for general air handling and ventilation applications. The fan wheel is suspended between bearings on either side of the fan housing. One bearing is located in the fan inlet and one in the airstream. Arrangement 3 SWSI is suitable for either belt drive or direct drive and is offered for all class VCR fans and all sizes except 105. Maximum operating temperature for Arrangement 3 SWSI fans is limited to 180°F, due to the bearings in the airstream.



Unitary Base Assembly Package
Arrangement 1 Backward Inclined



Arrangement 3 SWSI on Unitary Base

Arrangement 3 DWDI

Double width fans approximately double the air volume capacities of single width fans and allow maximum air handling with minimum unit size. Air enters the fan from both sides, exposing both bearings to the airstream. Arrangement 3 DWDI can be either belt drive or direct drive and is offered on all VCR fans except size 105. Maximum operating temperature is 180°F, due to the bearings in the airstream.

Arrangement 4

On Arrangement 4 fans the fan wheel is mounted directly on the motor shaft. There are no separate fan bearings so the motor bearings carry the full weight of the wheel. Arrangement 4 fans are offered in sizes up to 365 and in Class I, II, or III construction. Maximum operating temperature is 180°F, due to the bearings in the airstream.

Arrangement 7 SWSI & DWDI

These arrangements can be either belt drive or direct drive, but direct drive is more common. Arrangement 7 is very similar to Arrangement 3 except that Arrangement 7 fans have an integral motor mounting pedestal. On single width versions one bearing is in the airstream. On double width fans both bearings are in the airstream. Arrangement 7 is offered for single and double width fans (except size 105) in Class I, II and III. Maximum operating temperature is 180°F, due to the bearings in the airstream.

Arrangement 8

Arrangement 8 is similar to Arrangement 1 with the addition of an integral motor mounting pedestal. Direct drive is the most common version, but belt drive Arrangement 8 VCR fans are also available. This configuration is offered for single width VCR fans (except size 105) in Class I, II and III. With appropriate accessories, this fan can handle temperatures up to 1000°F with the backward inclined wheel.

Arrangement 9

Similar to Arrangement 1, Arrangement 9 is offered for all classes of VCR fans and for all sizes except 105. Arrangement 9 fans are for belt drive only and the motor is mounted on the side of the bearing pedestal. Arrangement 9 is suitable for operating temperatures up to 750°F.

Arrangement 10

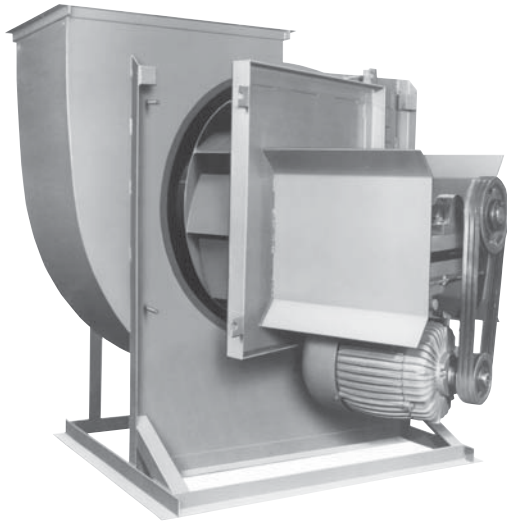
Arrangement 10 is usually used for general ventilation applications. The motor is mounted on the inside of an open type bearing pedestal. This space saving configuration is offered for all Class I, II and III VCR fans. Arrangement 10 can be used for operating temperatures up to 750°F.



Unitary Base Assembly Package
Arrangement 1

Options and Accessories

VCR Fan



SwingOut Fan

SwingOut Fan

PennBarry SwingOut fans offer superior accessibility for air handling systems that must be cleaned or serviced regularly. Ductwork does not need to be disturbed so downtime is minimized.

On a SwingOut fan the entire rotating assembly and power train is mounted on a hinged access door which is reinforced with angle iron framing. Hinges employ ball type thrust bearings to assure proper wheel alignment. Door latches are hand opened without tools. Gaskets on the swing out assembly assure a tight seal.

SwingOut fans are available with backward inclined and airfoil wheels, in wheel diameters from 22 1/4" through 49".

Access Doors



Access doors are designed to provide easy inspection or cleaning of the fan interior and wheel. The standard type door on PennBarry VCR fans is the hinged, quick opening type. Hardware is stainless steel to resist corrosion.

Raised access doors are available for when high operating temperatures require the fan to be insulated. The interior part of the door holds 4" of insulation. To prevent turbulence in the airstream, the inside surface of the raised door is flush with the inside surface of the fan scroll. Like the standard type door, the raised door is hinged and hardware is stainless steel.

Spark Resistant Construction

AMCA Standards define three types of spark resistant construction:

- Type A — All parts of the fan in contact with the airstream must be made of non-ferrous material.
- Type B — The fan shall have a non-ferrous impeller and non-ferrous ring about the opening through which the shaft passes. Ferrous hubs, shafts, and hardware are allowed if construction is such that a shift of impeller or shaft will not permit two ferrous parts of the fan to rub or strike.
- Type C — The fan must be so constructed that a shift of the wheel will not permit two ferrous parts of the fan to rub or strike.

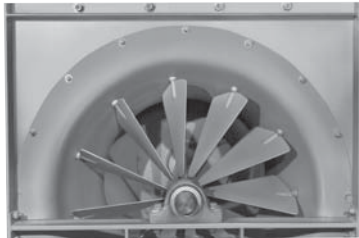
All three types of spark resistant construction are offered on VCR fans. Aluminum and monel are used to manufacture parts that must be non-ferrous. Arrangements 3 and 7 cannot have spark resistant construction because bearings are not allowed in the airstream of spark resistant fans. All airstream accessories must also be non-ferrous on Type A construction.

Drains

Drains are available on all fans except those with bottom horizontal or bottom angular down discharges. Drains are located at the lowest point of the scroll. Standard type is 3/4" NPT external threads.

Variable and Fixed Inlet Vanes

Regulating the airflow at the fan inlet with variable inlet vanes is much more efficient than regulating airflow at the fan discharge with dampers. When inlet vanes are partially closed, incoming air is prespun in the direction of the wheel rotation.



Nestled Inlet Vane

Three types of inlet vanes are offered on VCR fans. Nested variable inlet vanes — mounted within the fan inlet cone—are available on Class I, II, and III fans, size 165 and larger, and on Class IV fans, size 490 and larger.

Externally mounted variable inlet vanes are bolted to the fan's inlet flange. External vanes are available on all class VCR fans and on all sizes except 105.

Fixed inlet vanes—welded to the fan inlet cone—are available on Class 1 and II fans, size 270 through 600.

Standard construction of both nested and external inlet vanes are suitable for operating temperatures to 200°F. Both types feature stainless steel rods and bronze oilite bushings. High temperature inlet vanes, nested and external, can be used up to 600°F. The high temperature design has powdered metal bushings rather than the bronze oilite type. Inlet vanes are suitable for either manual or automatic control.



Fan with Fixed Inlet Vane

Discharge Dampers

Discharge dampers are more heavily constructed than shutters. Dampers can be used to control air in addition to keeping out weather and backdrafts. Both parallel blade and opposed blade types can be supplied. The latter should be specified for most volume control applications, because the opposed blade design distributes airflow more uniformly than the parallel blade design.



Discharge Damper

Discharge dampers are suitable for either manual or automatic control and can be used with all discharge positions. Dampers are flanged on both sides and mount to the discharge flange of the fan. Standard construction can be used when the operating temperature is up to 200°F, but a high temperature design is supplied for temperatures to 600°F.

Belt Guards

The standard, totally enclosed belt guards have a solid sheet metal back and removable front. Belt guards are normally shipped loose with required mounting clips. On Arrangement 9 and 10 fans, when the motor and drive are mounted at the factory, belt guards are shipped mounted on the fan.

Weather Covers

Weather resistant covers enclosing the drive assembly, motor, shaft and bearings are available for Arrangement 10 VCR fans. These covers protect the shaft, bearings and drive from moisture and excessive dirt. Standard weather covers can be used for operating temperatures up to 300°F. Specially vented weather covers are available for temperatures up to 500°F.

Discharge Shutters



Discharge Shutter

Gravity operated discharge shutters open when the fan is running and close when the fan is not running. They shut out weather and backdrafts, but do not control airflow. Motorized shutters are available for tighter shutoff. The gravity shutters are not suitable for downblast or angular down discharge positions. Gravity and motorized shutters are limited to 200°F.

Inlet and Discharge Screens

Screens are recommended whenever there is an unducted inlet or discharge. They protect personnel from injury and guard against foreign objects entering the fan. Inlet screens are heavy-gauge zinc plated steel wire. Discharge screens are heavy-gauge wire.

Options and Accessories

VCR Fan

Inlet Boxes

Inlet boxes are frequently requested for some applications and we offer inlet boxes for both single and double width fans. Inlet boxes are designed to be aerodynamically efficient. On all Arrangement 3 SWSI and Arrangement 3 DWDI fans with inlet boxes, independent bearing pedestals are required because bearings must be mounted outside the inlet box.

Flanges

Discharge flanges, unpunched, are standard equipment on Class I and II VCR fans, size 402 and larger, and on all Class III and IV VCR fans. Discharge flanges are available as options on smaller size Class I and II fans. Inlet flanges are available on all fans, as are companion flanges for inlets and discharges.

Special Coatings

The standard paint on PennBarry VCR fans is a tough, corrosion resistant enamel, but special coatings are often required to protect fans in difficult conditions. Please consult your representative for additional coatings offered.

Bolted Construction

In some cases, especially in retrofit projects, limited space may prevent the installation of a fully assembled fan. For these difficult-to-fit applications, Arrangement 3 fans are offered with totally bolted construction. The housing and frame can be assembled right at the jobsite. Bolted construction is available for all classes in sizes 245 and larger.

Split Housings

To facilitate handling, split housing construction is available on all VCR fans, size 270 and larger. Scroll sections are bolted together and can be easily separated for cleaning or repair. Fans can be split vertically or horizontally. They can have pie splits for wheel removal or they can be split into three sections.

Shaft Seals

Shaft seals are available on all single width VCR fans, and are standard equipment on fans with heat fan packages. The aluminum retainer plate is bolted to the fan housing. A heat resistant material is used for the seal on the standard shaft seal. Neoprene, teflon, and stuffing box shaft seals are also supplied.

Heat Fan Packages

Arrangements 1, 8, 9 and 10 VCR fans in standard construction are suitable for operating temperatures to 300°F. Heat fan packages are available on these arrangements for temperatures of 500°F, 750°F and 1000°F. The 500°F package includes a shaft cooler and guard, a shaft seal, high temperature grease bearings and a motor heat shield on Arrangements 9 and 10. The 750°F package adds high temperature paint. On applications to 1000°F, consult your representative.

Vibration Isolation Equipment

VCR fans can be supplied with vibration rails, unitary bases or inertia frames.

Other Available Extras

Special Bearings - Contact Factory

Scroll Volume Dampers

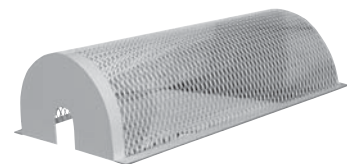
Weep Holes on
Airfoil Blades

Shaft Guards

Narrow Width Fans

Dual Shaft Extensions

Special Nameplates



Shaft Guard

Consult your representative for details.

Dimensional Data for Backward Inclined Fans

VCR Fan

Wheel Weights, WR², Maximum RPM

In selecting small motors for use with relatively large fans, care should be used to ensure sufficient motor torque. The starting torque capability of the motor should be compared to the WR² value for the given fan wheel.

Single Width – Single Inlet

| Size | CLASS I | | | | CLASS II | | | | CLASS III | | | | CLASS IV | | | |
|------|--------------|---|----------------|------------------|--------------|---|----------------|------------------|--------------|---|----------------|------------------|--------------|---|----------------|------------------|
| | Wheel Weight | ① WR ² (lb-ft ²) | ② Max. Fan RPM | ③ Max. Wheel RPM | Wheel Weight | ① WR ² (lb-ft ²) | ② Max. Fan RPM | ③ Max. Wheel RPM | Wheel Weight | ① WR ² (lb-ft ²) | ② Max. Fan RPM | ③ Max. Wheel RPM | Wheel Weight | ① WR ² (lb-ft ²) | ② Max. Fan RPM | ③ Max. Wheel RPM |
| 105 | 11 | 0.80 | 3820 | 3920 | 13 | 1.1 | 4391 | 4417 | – | – | – | – | – | – | – | – |
| 122 | 13 | 1.65 | 3195 | 3663 | 18 | 2.5 | 4168 | 4729 | 22 | 2.8 | 5241 | 5645 | 25 | 3.3 | 5760 | 6435 |
| 135 | 15 | 2.45 | 2895 | 3166 | 21 | 3.7 | 3786 | 4080 | 26 | 4.2 | 4774 | 5562 | 29 | 4.8 | 5222 | 5562 |
| 150 | 19 | 3.95 | 2589 | 2858 | 25 | 5.5 | 3384 | 3871 | 30 | 6.2 | 4288 | 4749 | 33 | 7.0 | 4707 | 4749 |
| 165 | 27 | 6.5 | 2376 | 2797 | 33 | 8.7 | 3100 | 3611 | 36 | 9.1 | 3887 | 4117 | 40 | 10.5 | 4276 | 4796 |
| 182 | 33 | 10.5 | 2084 | 2405 | 40 | 13.0 | 2722 | 3104 | 42 | 13.6 | 3425 | 3539 | 57 | 17.0 | 3763 | 4123 |
| 200 | 39 | 15.0 | 1904 | 2096 | 49 | 19.5 | 2475 | 2706 | 52 | 20.9 | 3121 | 3594 | 65 | 24.0 | 3434 | 3594 |
| 222 | 64 | 27.5 | 1708 | 1786 | 73 | 33.0 | 2228 | 2306 | 82 | 38.0 | 2810 | 3063 | 106 | 46.0 | 3083 | 3943 |
| 245 | 73 | 39.0 | 1551 | 1996 | 83 | 46.0 | 2028 | 2275 | 110 | 57.5 | 2555 | 2650 | 132 | 73.0 | 2801 | 3413 |
| 270 | 84 | 56.0 | 1384 | 1725 | 97 | 68.0 | 1803 | 1967 | 128 | 81.5 | 2276 | 2950 | 158 | 108.0 | 2540 | 2950 |
| 300 | 703 | 89.0 | 1247 | 1473 | 118 | 106.0 | 1622 | 1697 | 149 | 127.0 | 2049 | 2519 | 184 | 160.0 | 2288 | 2519 |
| 330 | 135 | 128.0 | 1131 | 1277 | 150 | 151.0 | 1470 | 1696 | 177 | 188.0 | 1864 | 2183 | 217 | 233.0 | 2078 | 2183 |
| 365 | 169 | 212.0 | 1011 | 1098 | 196 | 238.0 | 1322 | 1458 | 232 | 308.0 | 1669 | 1877 | 292 | 378.0 | 1882 | 2186 |
| 402 | 257 | 353.0 | 914 | 948 | 287 | 414.0 | 1201 | 1259 | 320 | 480.0 | 1512 | 1621 | 394 | 590.0 | 1696 | 1888 |
| 445 | 294 | 505.0 | 832 | 929 | 331 | 590.0 | 1086 | 1083 | 392 | 700.0 | 1368 | 1394 | 457 | 850.0 | 1537 | 1624 |
| 490 | 335 | 722.0 | 752 | 937 | 402 | 860.0 | 985 | 1207 | 453 | 1010.0 | 1240 | 1406 | 530 | 1220.0 | 1397 | 1532 |
| 542 | 530 | 1310.0 | 679 | 804 | 584 | 1510.0 | 889 | 1036 | 679 | 1875.0 | 1122 | 1207 | 705 | 1930.0 | 1257 | 1315 |
| 600 | 644 | 2055.0 | 618 | 754 | 684 | 2220.0 | 802 | 1037 | 790 | 2720.0 | 1015 | 1037 | 858 | 2960.0 | 1125 | 1130 |
| 660 | 743 | 3040.0 | 562 | 653 | 790 | 3190.0 | 729 | 899 | 924 | 3930.0 | 922 | 980 | 1120 | 4370.0 | 974 | 980 |
| 730 | 926 | 4700.0 | 507 | 562 | 996 | 5170.0 | 657 | 773 | 1091 | 5800.0 | 832 | 842 | 1295 | 6400.0 | 937 | 1028 |
| 807 | 1170 | 7500.0 | 453 | 589 | 1256 | 8200.0 | 558 | 664 | 1405 | 8700.0 | 732 | 786 | 1527 | 9450.0 | 848 | 884 |
| 890 | 1385 | 11150.0 | 416 | 509 | 1488 | 12000.0 | 543 | 574 | 1648 | 12750.0 | 625 | 713 | 1788 | 13600.0 | 764 | 764 |

Double Width – Double Inlet

| Size | CLASS I | | | | CLASS II | | | | CLASS III | | | | CLASS IV | | | |
|------|--------------|---|----------------|------------------|--------------|---|----------------|------------------|--------------|---|----------------|------------------|--------------|---|----------------|------------------|
| | Wheel Weight | ① WR ² (lb-ft ²) | ② Max. Fan RPM | ③ Max. Wheel RPM | Wheel Weight | ① WR ² (lb-ft ²) | ② Max. Fan RPM | ③ Max. Wheel RPM | Wheel Weight | ① WR ² (lb-ft ²) | ② Max. Fan RPM | ③ Max. Wheel RPM | Wheel Weight | ① WR ² (lb-ft ²) | ② Max. Fan RPM | ③ Max. Wheel RPM |
| 122 | 20 | 2.7 | 3495 | 3663 | 27 | 4.0 | 4730 | 4729 | 35 | 4.6 | 5753 | 5645 | 40 | 5.5 | - | 6435 |
| 135 | 23 | 4.0 | 3167 | 3166 | 37 | 6.1 | 4294 | 4080 | 40 | 7.0 | 5238 | 5562 | 44 | 8.1 | - | 5562 |
| 150 | 28 | 6.3 | 2830 | 2858 | 42 | 9.0 | 3871 | 3871 | 52 | 10.5 | 4687 | 4749 | 58 | 12.1 | - | 4749 |
| 165 | 44 | 10.5 | 2590 | 2797 | 58 | 14.3 | 3518 | 3611 | 73 | 16.0 | 4278 | 4117 | 80 | 18.7 | - | 4796 |
| 182 | 56 | 17.5 | 2100 | 2405 | 68 | 20.3 | 2731 | 3104 | 84 | 23.7 | 3465 | 3539 | 95 | 28.5 | 3746 | 4123 |
| 200 | 63 | 24.8 | 1923 | 2096 | 95 | 33.5 | 2504 | 2706 | 100 | 36.3 | 3114 | 3594 | 110 | 40.5 | 3746 | 3594 |
| 222 | 114 | 43.0 | 1725 | 1786 | 131 | 54.0 | 2252 | 2306 | 143 | 61.0 | 2821 | 3063 | 170 | 77.0 | 2884 | 3943 |
| 245 | 127 | 61.0 | 1563 | 1996 | 146 | 75.0 | 2030 | 2275 | 177 | 94.0 | 2565 | 2650 | 207 | 118.0 | 2803 | 3413 |
| 270 | 144 | 88.0 | 1180 | 1725 | 170 | 112.0 | 1844 | 1967 | 207 | 133.0 | 2303 | 2950 | 242 | 176.0 | 2529 | 2950 |
| 300 | 174 | 143.0 | 1264 | 1473 | 212 | 178.0 | 1660 | 1697 | 239 | 210.0 | 2091 | 2519 | 313 | 268.0 | 2267 | 2519 |
| 330 | 210 | 211.0 | 1151 | 1277 | 250 | 259.0 | 1506 | 1696 | 315 | 318.0 | 1893 | 2183 | 400 | 410.0 | 2078 | 2183 |
| 365 | 270 | 388.0 | 1056 | 1098 | 312 | 385.0 | 1391 | 1458 | 380 | 490.0 | 1735 | 1877 | 476 | 630.0 | 1880 | 2186 |
| 402 | 393 | 570.0 | 948 | 948 | 435 | 650.0 | 1247 | 1259 | 483 | 755.0 | 1575 | 1621 | 555 | 915.0 | 1698 | 1888 |
| 445 | 449 | 820.0 | 866 | 929 | 503 | 945.0 | 1130 | 1083 | 562 | 1100.0 | 1414 | 1394 | 650 | 1330.0 | 1545 | 1624 |
| 490 | 515 | 1180.0 | 784 | 937 | 583 | 1380.0 | 1026 | 1207 | 656 | 1600.0 | 1294 | 1406 | 768 | 1940.0 | 1386 | 1532 |
| 542 | 806 | 2050.0 | 706 | 804 | 885 | 2340.0 | 926 | 1036 | 1072 | 2980.0 | 1166 | 1207 | 1100 | 3070.0 | 1258 | 1315 |
| 600 | 998 | 3310.0 | 643 | 754 | 1036 | 3470.0 | 835 | 1037 | 1240 | 4300.0 | 1056 | 1037 | 1300 | 4600.0 | 1128 | 1130 |
| 660 | 1151 | 5050.0 | 585 | 653 | 1225 | 5000.0 | 761 | 899 | 1445 | 6300.0 | 961 | 980 | 1520 | 6650.0 | 977 | 980 |
| 730 | 2135 | 8950.0 | 528 | 562 | 2270 | 9900.0 | 688 | 773 | 2500 | 10800.0 | 868 | 842 | 2560 | 11300.0 | 933 | 1028 |
| 807 | 2450 | 13000.0 | 477 | 589 | 2620 | 14500.0 | 618 | 664 | 2800 | 15400.0 | 782 | 786 | 2900 | 16000.0 | 849 | 884 |
| 890 | 2750 | 18400.0 | 432 | 509 | 3000 | 20500.0 | 564 | 574 | 3170 | 22000.0 | 713 | 713 | 3300 | 23000.0 | 750 | 764 |

① WR² is for complete rotating assembly. See Engineering Data 16000.

② Maximum fan RPM is based on AMCA Fan Class Operating Limits (see page 107) – See Catalog Tabular Data.

③ Maximum wheel RPM to be used for high temperature/material derate – see page 111.

NOTES: On Class I, II and III fans, shaft and bearing sizes are based on the fan's maximum cataloged operating speed. Since "Class IV" is not defined by AMCA, shaft and bearing sizes on "Class IV" fans are designed to meet or exceed specified conditions.

Dimensional Data for Airfoil Fans

VCR Fan

Wheel Weights, WR², Maximum RPM

In selecting small motors for use with relatively large fans, care should be used to ensure sufficient motor torque. The starting torque capability of the motor should be compared to the WR² value for the given fan wheel.

Single Width – Single Inlet

| Size | CLASS I | | | | CLASS II | | | | CLASS III | | | | CLASS IV | | | |
|------|--------------|--|--------------|----------------|--------------|--|--------------|----------------|--------------|--|--------------|----------------|--------------|--|--------------|----------------|
| | Wheel Weight | WR ² (lb-ft ²) ^① | Max. Fan RPM | Max. Wheel RPM | Wheel Weight | WR ² (lb-ft ²) ^① | Max. Fan RPM | Max. Wheel RPM | Wheel Weight | WR ² (lb-ft ²) ^① | Max. Fan RPM | Max. Wheel RPM | Wheel Weight | WR ² (lb-ft ²) ^① | Max. Fan RPM | Max. Wheel RPM |
| 182 | 38 | 11.3 | 2256 | 2339 | 39 | 11.3 | 2959 | 3039 | 54 | 16.7 | 3735 | 3818 | 74 | 22.7 | 4071 | 4079 |
| 200 | 46 | 16.2 | 2077 | 2135 | 46 | 16.2 | 2703 | 2773 | 64 | 25.7 | 3409 | 3483 | 85 | 32.0 | 3714 | 3728 |
| 222 | 69 | 27.3 | 1875 | 1919 | 69 | 27.4 | 2413 | 2493 | 96 | 43.8 | 3065 | 3131 | 118 | 48.8 | 3341 | 3344 |
| 245 | 78 | 38.3 | 1691 | 1742 | 79 | 38.5 | 2199 | 2264 | 123 | 62.7 | 2780 | 2844 | 148 | 78.5 | 3038 | 3042 |
| 270 | 101 | 63.0 | 1479 | 1545 | 102 | 63.5 | 1928 | 2007 | 144 | 87.0 | 2423 | 2524 | 178 | 110.0 | 2748 | 2756 |
| 300 | 124 | 100.0 | 1328 | 1390 | 125 | 101.0 | 1730 | 1806 | 169 | 139.0 | 2182 | 2271 | 210 | 175.0 | 2479 | 2480 |
| 330 | 158 | 144.0 | 1209 | 1264 | 159 | 145.0 | 1579 | 1642 | 193 | 201.0 | 1984 | 2065 | 247 | 254.0 | 2250 | 2254 |
| 365 | 184 | 211.0 | 1073 | 1124 | 185 | 212.0 | 1401 | 1458 | 255 | 319.0 | 1759 | 1833 | 322 | 390.0 | 2038 | 2039 |
| 402 | 297 | 387.0 | 972 | 1119 | 298 | 388.0 | 1264 | 1322 | 372 | 536.0 | 1598 | 1662 | 431 | 602.0 | 1847 | 1848 |
| 445 | 343 | 558.0 | 882 | 922 | 345 | 562.0 | 1150 | 1196 | 453 | 784.0 | 1447 | 1503 | 502 | 873.0 | 1667 | 1673 |
| 490 | 397 | 808.0 | 799 | 837 | 419 | 816.0 | 1043 | 1086 | 525 | 1110.0 | 1314 | 1365 | 578 | 1248.0 | 1516 | 1517 |
| 542 | 575 | 1319.0 | 719 | 756 | 606 | 1422.0 | 940 | 981 | 730 | 1889.0 | 1186 | 1233 | 786 | 2038.0 | 1361 | 1364 |
| 600 | 657 | 1891.0 | 651 | 683 | 697 | 2048.0 | 847 | 887 | 851 | 2740.0 | 1071 | 1115 | 954 | 3150.0 | 1237 | 1241 |
| 660 | 753 | 2793.0 | 594 | 621 | 805 | 3030.0 | 769 | 806 | 991 | 3940.0 | 972 | 1013 | 1233 | 4548.0 | 1124 | 1127 |
| 730 | 939 | 4280.0 | 537 | 562 | 943 | 4300.0 | 700 | 729 | 1173 | 5827.0 | 879 | 916 | 1473 | 6888.0 | 1012 | 1018 |
| 807 | 1277 | 7562.0 | 484 | 508 | 1283 | 7598.0 | 631 | 659 | 1506 | 8733.0 | 796 | 828 | 1728 | 10154.0 | 920 | 922 |
| 890 | 1514 | 11088.0 | 440 | 461 | 1521 | 11141.0 | 575 | 598 | 1683 | 12765.0 | 723 | 751 | 2031 | 14826.0 | 834 | 836 |

Double Width – Double Inlet

| Size | CLASS I | | | | CLASS II | | | | CLASS III | | | | CLASS IV | | | |
|------|--------------|--|--------------|----------------|--------------|--|--------------|----------------|--------------|--|--------------|----------------|--------------|--|--------------|----------------|
| | Wheel Weight | WR ² (lb-ft ²) ^① | Max. Fan RPM | Max. Wheel RPM | Wheel Weight | WR ² (lb-ft ²) ^① | Max. Fan RPM | Max. Wheel RPM | Wheel Weight | WR ² (lb-ft ²) ^① | Max. Fan RPM | Max. Wheel RPM | Wheel Weight | WR ² (lb-ft ²) ^① | Max. Fan RPM | Max. Wheel RPM |
| 182 | 62 | 18.3 | 2285 | 2339 | 66 | 18.4 | 2949 | 3039 | 108 | 31.8 | 3720 | 3818 | 128 | 39.8 | 4067 | 4079 |
| 200 | 72 | 26.1 | 2086 | 2135 | 89 | 27.1 | 2694 | 2773 | 126 | 46.2 | 3401 | 3483 | 147 | 56.0 | 3712 | 3728 |
| 222 | 122 | 43.0 | 1872 | 1919 | 122 | 43.4 | 2416 | 2493 | 171 | 73.4 | 3049 | 3131 | 191 | 83.2 | 3313 | 3344 |
| 245 | 137 | 60.0 | 1691 | 1742 | 137 | 61.2 | 2197 | 2264 | 202 | 105.0 | 2776 | 2844 | 237 | 131.0 | 3025 | 3042 |
| 270 | 167 | 97.0 | 1473 | 1545 | 168 | 97.5 | 1911 | 2007 | 235 | 146.0 | 2409 | 2524 | 278 | 182.0 | 2747 | 2756 |
| 300 | 203 | 157.0 | 1330 | 1390 | 211 | 159.0 | 1719 | 1806 | 276 | 236.0 | 2164 | 2271 | 360 | 299.0 | 2474 | 2480 |
| 330 | 242 | 230.0 | 1202 | 1264 | 250 | 232.0 | 1564 | 1642 | 353 | 346.0 | 1972 | 2065 | 455 | 456.0 | 2352 | 2254 |
| 365 | 279 | 333.0 | 1080 | 1124 | 287 | 337.0 | 1406 | 1458 | 421 | 522.0 | 1758 | 1833 | 529 | 662.0 | 1960 | 2039 |
| 402 | 417 | 608.0 | 980 | 1119 | 419 | 611.0 | 1263 | 1322 | 577 | 879.0 | 1586 | 1662 | 615 | 958.0 | 1781 | 1848 |
| 445 | 516 | 887.0 | 884 | 922 | 519 | 891.0 | 1146 | 1196 | 667 | 1283.0 | 1421 | 1503 | 721 | 1358.0 | 1670 | 1673 |
| 490 | 600 | 1291.0 | 805 | 837 | 603 | 1298.0 | 1040 | 1086 | 788 | 1857.0 | 1308 | 1365 | 846 | 2020.0 | 1495 | 1517 |
| 542 | 883 | 2084.0 | 725 | 756 | 915 | 2191.0 | 938 | 981 | 1160 | 3042.0 | 1178 | 1233 | 1222 | 3303.0 | 1340 | 1364 |
| 600 | 1008 | 3009.0 | 657 | 683 | 1050 | 3172.0 | 850 | 887 | 1346 | 4417.0 | 1071 | 1115 | 1463 | 4938.0 | 1273 | 1241 |
| 660 | 1155 | 4504.0 | 596 | 621 | 1235 | 4762.0 | 772 | 806 | 1560 | 6364.0 | 974 | 1013 | 1702 | 7105.0 | 1110 | 1127 |
| 730 | 2222 | 8274.0 | 520 | 562 | 2232 | 8313.0 | 699 | 729 | 2665 | 10904.0 | 879 | 916 | 2892 | 12399.0 | 1007 | 1018 |
| 807 | 2732 | 13335.0 | 486 | 508 | 2744 | 13398.0 | 631 | 659 | 3000 | 15652.0 | 794 | 828 | 3282 | 17683.0 | 921 | 922 |
| 890 | 3070 | 18776.0 | 441 | 461 | 3085 | 18865.0 | 571 | 598 | 3413 | 21972.0 | 717 | 751 | 3742 | 25215.0 | 834 | 836 |

① WR² is for complete rotating assembly. See Engineering Data 16000.

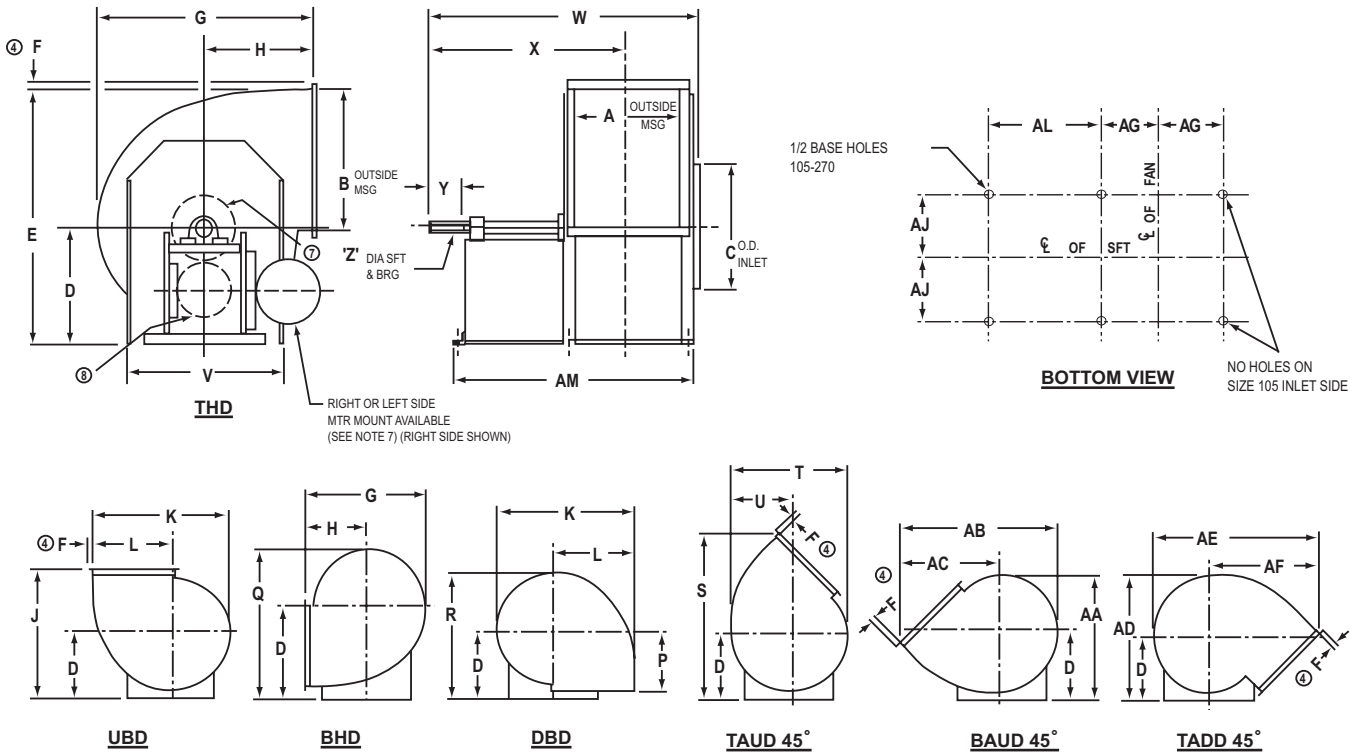
② Maximum fan RPM is based on AMCA Fan Class Operating Limits (see page 107) – See Catalog Tabular Data.

③ Maximum wheel RPM to be used for high temperature/material derate – see page 111.

NOTES: On Class I, II and III fans, shaft and bearing sizes are based on the fan's maximum cataloged operating speed. Since "Class IV" is not defined by AMCA, shaft and bearing sizes on "Class IV" fans are designed to meet or exceed specified conditions.

VCR Dimensional Data

BI & AF – Arrangement 1, 4, 9 & 10, SWSI, Class I & II



Notes

- CW rotation shown; CCW rotation similar but opposite.
- AF available in sizes 182 through 270.
- BI available in sizes 105 through 270.
- Discharge angles optional on all sizes. (Hole punching optional on all sizes.)
- On specific sales orders, see Fan Data Schedule for performance and accessory information.
- On Arrangement 9, the standing motor position is left side for CW units and right side for CCW units.
- Dimensions for Arrangement 4 are the same as shown except motor is mounted on pedestal in lieu of shaft and bearings.
- On Arrangement 10, the motor is located within the pedestal.
- Housing is field rotatable to the discharges shown.
- Unit size 105 has no inlet stand.

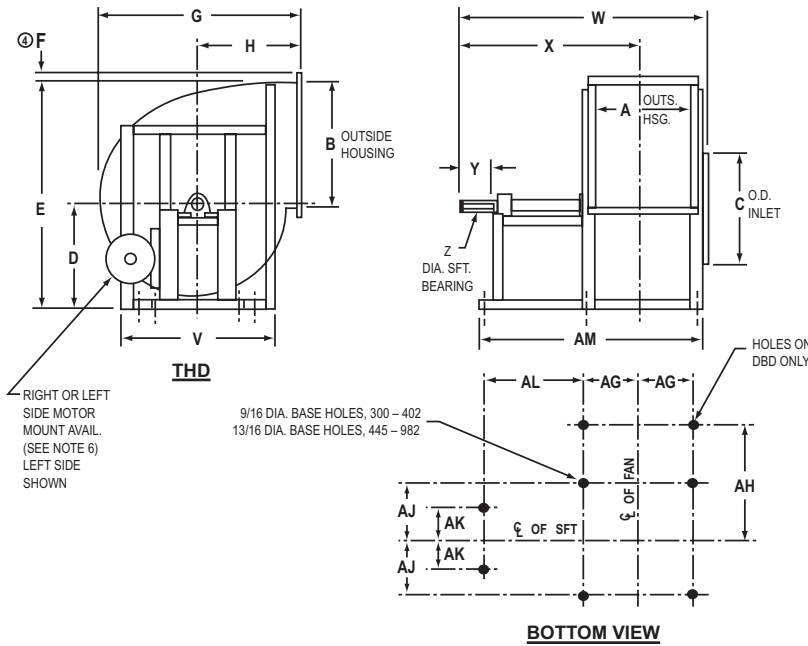
| Size | A | B | C | "D" Centerline of Fan | | | | | | E | ④ F | G | H | J | K | L | P | Q | R | S | T |
|------|----------|----------|---------|-----------------------|-----|-----|-----|------|------|----------|-------|----------|--------|--------|---------|----------|--------|----------|----------|----------|---------|
| | | | | THD | UBD | BHD | DBD | TAUD | BAUD | | | | | | | | | | | | |
| 105 | 8 3/8 | 11 3/16 | 11 1/8 | 18 | 18 | 18 | 18 | 18 | 18 | 29 1/8 | 1 1/4 | 17 11/16 | 8 5/8 | 26 5/8 | 19 1/8 | 11 1/8 | 8 5/8 | 26 | 27 1/16 | 32 | 17 |
| 122 | 9 3/4 | 13 | 13 1/4 | 20 | 20 | 20 | 20 | 20 | 20 | 32 15/16 | 1 1/4 | 20 13/16 | 10 1/4 | 30 1/4 | 22 1/4 | 12 15/16 | 10 1/4 | 29 5/16 | 30 9/16 | 36 7/16 | 19 7/8 |
| 135 | 10 13/16 | 14 5/16 | 14 9/16 | 20 | 20 | 20 | 20 | 20 | 20 | 34 1/4 | 1 1/4 | 22 7/8 | 11 1/4 | 31 1/4 | 24 1/2 | 14 1/4 | 11 1/4 | 30 1/4 | 31 5/8 | 38 | 21 7/8 |
| 150 | 11 15/16 | 15 7/8 | 16 3/16 | 22 | 22 | 22 | 22 | 22 | 22 | 37 13/16 | 1 1/4 | 25 7/16 | 12 1/2 | 34 1/2 | 27 1/4 | 15 13/16 | 12 1/2 | 33 7/16 | 34 15/16 | 42 | 24 5/16 |
| 165 | 13 3/16 | 17 3/8 | 17 3/4 | 23 | 23 | 23 | 23 | 23 | 23 | 40 5/16 | 1 1/4 | 28 | 13 3/4 | 36 3/4 | 29 7/8 | 17 5/16 | 13 3/4 | 35 9/16 | 37 1/4 | 45 | 26 3/4 |
| 182 | 14 3/8 | 19 3/8 | 19 1/2 | 23 | 23 | 23 | 23 | 23 | 23 | 42 5/16 | 1 1/4 | 30 3/16 | 14 1/2 | 37 1/2 | 33 1/8 | 19 5/16 | 14 1/2 | 36 13/16 | 38 11/16 | 46 15/16 | 29 5/8 |
| 200 | 16 | 21 1/4 | 21 3/8 | 26 | 26 | 26 | 26 | 26 | 26 | 47 3/16 | 1 1/4 | 32 7/8 | 15 5/8 | 41 5/8 | 36 3/8 | 21 3/16 | 15 5/8 | 41 3/16 | 43 1/4 | 52 1/16 | 32 1/2 |
| 222 | 17 1/2 | 23 5/8 | 23 3/4 | 26 | 26 | 26 | 26 | 26 | 26 | 49 9/16 | 1 1/4 | 36 5/8 | 17 1/2 | 43 1/2 | 40 7/16 | 23 9/16 | 17 1/2 | 42 7/8 | 45 1/8 | 55 | 36 |
| 245 | 19 1/2 | 25 15/16 | 26 1/16 | 28 | 28 | 28 | 28 | 28 | 28 | 53 7/8 | 1 1/4 | 40 5/16 | 19 1/4 | 47 1/4 | 44 7/16 | 25 7/8 | 19 1/4 | 46 9/16 | 49 1/16 | 60 | 39 3/4 |
| 270 | 21 9/16 | 28 5/8 | 28 1/2 | 31 | 31 | 31 | 31 | 31 | 31 | 59 9/16 | 1 1/4 | 44 5/16 | 21 1/8 | 52 1/8 | 49 | 28 9/16 | 21 1/8 | 51 7/16 | 54 3/16 | 67 | 43 3/4 |

| Size | U | V | W | X | Y | Z - CLASS I | | Z - CLASS II | | AA | AB | AC | AD | AE | AF | AG | AJ | AL | AM | Max Mtr. Frame ARR. 9 & 10 |
|------|----------|----------|---------|---------|-------|-------------|------------|--------------|------------|----------|----------|----------|----------|----------|---------|---------|--------|--------|--------|-------------------------------|
| | | | | | | SFT | KWY | SFT | KWY | | | | | | | | | | | |
| | | | | | | ODP & TEFC | | | | | | | | | | | | | | |
| 105 | 9 9/16 | 13 7/16 | 25 9/16 | 20 1/16 | 2 | 1 | 1/4 x 1/8 | - | - | 25 7/16 | 22 1/2 | 14 | 27 9/16 | 24 3/8 | 15 7/8 | 5 1/16 | 6 1/8 | 13 1/2 | 24 5/8 | 145T |
| 122 | 11 3/16 | 17 3/16 | 32 | 23 7/8 | 2 1/2 | 1 | 1/4 x 1/8 | 1 3/16 | 1/4 x 1/8 | 28 11/16 | 26 3/8 | 16 7/16 | 31 3/16 | 31 11/16 | 21 3/4 | 5 7/8 | 7 3/4 | 16 | 29 | 184T |
| 135 | 12 5/16 | 17 11/16 | 33 1/8 | 24 7/16 | 2 1/2 | 1 | 1/4 x 1/8 | 1 3/16 | 1/4 x 1/8 | 29 9/16 | 28 15/16 | 18 | 32 5/16 | 34 5/16 | 23 3/8 | 6 7/16 | 7 3/4 | 16 | 30 1/8 | 184T |
| 150 | 13 11/16 | 19 11/16 | 37 3/4 | 28 1/2 | 3 | 1 | 1/4 x 1/8 | 1 3/16 | 1/4 x 1/8 | 32 5/8 | 32 3/16 | 20 | 35 11/16 | 37 7/16 | 25 1/4 | 6 15/16 | 8 3/4 | 19 | 34 1/8 | 213T |
| 165 | 15 1/16 | 20 11/16 | 39 | 29 1/8 | 3 | 1 3/16 | 1/4 x 1/8 | 1 7/16 | 3/8 x 3/16 | 34 11/16 | 35 3/8 | 22 | 38 11/16 | 40 3/8 | 27 | 7 9/16 | 9 1/4 | 19 | 35 3/8 | 215T |
| 182 | 16 5/8 | 22 11/16 | 41 1/8 | 30 3/16 | 3 1/2 | 1 3/16 | 1/4 x 1/8 | 1 7/16 | 3/8 x 3/16 | 36 | 38 11/16 | 23 15/16 | 39 5/8 | 44 1/8 | 29 3/8 | 8 3/16 | 9 1/4 | 19 | 36 5/8 | 215T |
| 200 | 18 1/4 | 25 3/16 | 47 3/4 | 36 | 3 1/2 | 1 3/16 | 1/4 x 1/8 | 1 7/16 | 3/8 x 3/16 | 40 1/4 | 42 1/4 | 26 1/16 | 44 1/4 | 47 5/8 | 31 7/16 | 9 1/4 | 11 | 24 | 44 1/4 | 254T |
| 222 | 20 3/8 | 27 3/16 | 49 1/2 | 37 | 4 | 1 7/16 | 3/8 x 3/16 | 1 11/16 | 3/8 x 3/16 | 41 5/8 | 47 | 29 | 46 3/8 | 52 1/2 | 34 1/2 | 10 | 11 | 24 | 45 3/4 | 254T |
| 245 | 22 3/8 | 29 15/16 | 53 | 39 1/2 | 4 1/2 | 1 7/16 | 3/8 x 3/16 | 1 11/16 | 3/8 x 3/16 | 45 3/8 | 51 3/4 | 32 | 50 3/8 | 57 7/16 | 37 5/8 | 11 | 12 | 25 | 48 3/4 | 256T |
| 270 | 24 3/4 | 33 3/16 | 55 1/8 | 40 9/16 | 4 1/2 | 1 7/16 | 3/8 x 3/16 | 1 11/16 | 3/8 x 3/16 | 50 | 56 15/16 | 35 1/8 | 55 3/4 | 62 7/16 | 40 5/8 | 12 | 12 1/2 | 25 | 50 3/4 | 256T |

TOLERANCE ± 1/8 Not to be used for construction. Certified drawings available upon request.

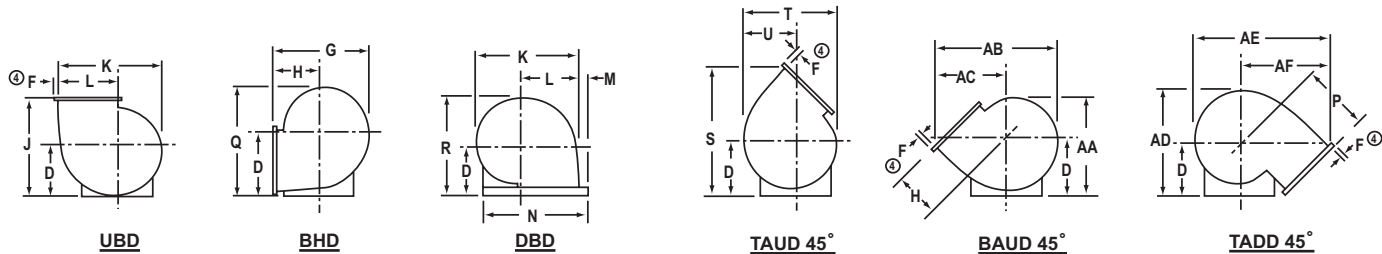
VCR Dimensional Data

BI & AF – Arrangement 1, 4, & 9, SWSI, Class I & II



Notes

1. CW rotation shown; CCW rotation similar but opposite.
2. AF available in sizes 300 through 890.
3. BI available in sizes 300 through 890.
4. Discharge angles standard on sizes 402 thru 890 only. (Hole punching optional on all sizes.)
5. On specific sales orders, see Fan Data Schedule for performance and accessory information.
6. On Arrangement 9, the standing motor position is left side for CW units and right side for CCW units.
7. Dimensions for Arrangement 4 through size 365 are the same as shown except motor is mounted on pedestal in lieu of shaft and bearings.
8. On DBD sizes 300 through 890, discharge is extended to base.



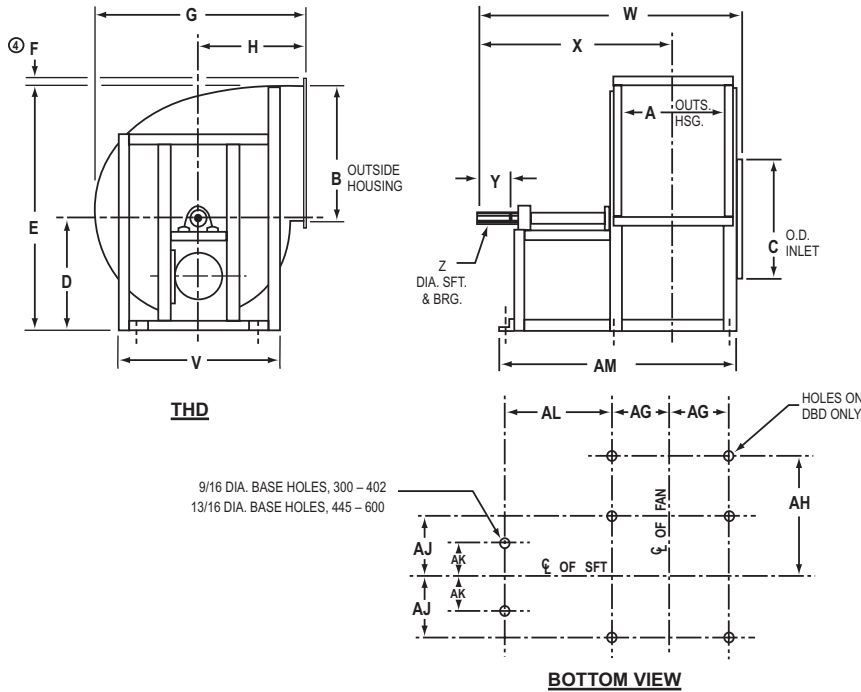
| Size | "D" Centerline of Fan | | | E | F | G | H | J | K | L | M | N | P | Q | R | S | | | | | | | |
|------|-----------------------|----------|---------|--------|--------|--------|--------|--------|--------|--------|----------|-------|----------|----------|----------|----------|---------|-------|---------|---------|----------|----------|---------|
| | THD | UBD | BHD | | | | | | | | | | | | | | DBD | TAUD | BAUD | TADD | | | |
| 300 | 23 11/16 | 31 13/16 | 31 5/8 | 27 | 27 | 35 | 27 | 27 | 35 | 27 | 58 3/4 | 1 1/2 | 49 1/4 | 23 7/16 | 50 7/16 | 54 1/2 | 31 3/4 | 2 1/2 | 54 3/4 | 32 7/16 | 57 3/4 | 52 13/16 | 66 1/8 |
| 330 | 26 1/4 | 34 15/16 | 34 3/4 | 27 | 35 | 38 | 27 | 35 | 38 | 35 | 61 7/8 | 1 1/2 | 54 3/16 | 25 13/16 | 60 13/16 | 59 7/8 | 34 7/8 | 2 1/2 | 59 7/8 | 34 9/16 | 63 | 55 3/8 | 77 7/8 |
| 365 | 28 7/8 | 38 11/16 | 38 1/2 | 35 | 35 | 41 | 35 | 35 | 41 | 35 | 73 5/8 | 1 1/2 | 60 1/8 | 28 5/8 | 63 5/8 | 66 5/16 | 38 5/8 | 2 1/2 | 65 1/8 | 37 1/8 | 68 11/16 | 66 1/2 | 82 5/8 |
| 402 | 32 1/16 | 42 9/16 | 42 7/16 | 37 | 37 | 45 1/2 | 37 | 37 | 45 1/2 | 37 | 79 1/2 | 2 | 66 11/16 | 32 | 69 | 73 1/16 | 42 1/2 | 2 1/2 | 71 | 41 | 76 1/16 | 71 11/16 | 89 3/8 |
| 445 | 35 1/4 | 47 3/16 | 46 7/8 | 37 | 41 | 50 | 37 | 41 | 50 | 37 | 84 1/16 | 2 | 72 1/8 | 33 3/4 | 74 3/4 | 80 7/8 | 47 1/16 | 3 | 78 7/8 | 44 | 83 13/16 | 75 3/8 | 98 1/4 |
| 490 | 39 | 51 13/16 | 51 5/8 | 39 | 44 | 55 | 39 | 44 | 55 | 39 | 90 3/4 | 2 | 79 11/16 | 37 1/2 | 81 1/2 | 88 7/8 | 51 3/4 | 3 | 85 3/4 | 47 3/4 | 92 1/8 | 81 3/16 | 107 1/8 |
| 542 | 42 3/4 | 57 7/16 | 57 1/8 | 44 | 49 | 60 | 44 | 49 | 60 | 44 | 101 3/8 | 2 | 87 1/4 | 40 1/2 | 89 1/2 | 98 9/16 | 57 3/8 | 4 | 95 7/8 | 51 3/4 | 101 3/16 | 90 3/4 | 118 1/4 |
| 600 | 47 3/8 | 63 7/16 | 63 1/8 | 48 | 54 | 66 1/2 | 48 | 54 | 66 1/2 | 48 | 111 3/8 | 2 | 96 3/16 | 44 1/2 | 98 1/2 | 108 7/8 | 63 3/8 | 4 | 104 7/8 | 56 | 112 | 99 11/16 | 130 3/8 |
| 660 | 52 1/2 | 69 13/16 | 69 3/8 | 52 1/2 | 59 | 73 1/4 | 49 | 55 3/4 | 63 | 49 1/2 | 122 1/4 | 2 1/2 | 105 3/4 | 49 | 108 | 119 5/8 | 69 3/4 | 5 | 114 3/4 | 61 1/2 | 123 1/8 | 105 3/4 | 139 3/4 |
| 730 | 57 7/8 | 77 1/4 | 76 3/4 | 57 | 64 1/2 | 80 3/4 | 57 3/4 | 61 3/4 | 69 1/2 | 54 1/4 | 134 1/8 | 2 1/2 | 120 5/8 | 57 3/4 | 122 1/4 | 132 1/2 | 77 1/8 | 5 | 126 1/8 | 67 | 136 1/8 | 120 5/8 | 157 1/8 |
| 807 | 63 13/16 | 85 7/16 | 84 7/8 | 63 | 72 | 89 | 63 3/4 | 67 1/2 | 76 1/2 | 59 1/2 | 148 5/16 | 2 1/2 | 133 5/16 | 63 3/4 | 135 3/4 | 146 9/16 | 85 5/16 | 5 | 138 1/8 | 72 3/4 | 150 1/4 | 133 5/16 | 172 7/8 |
| 890 | 70 1/8 | 94 1/4 | 93 3/8 | 69 1/4 | 78 1/4 | 97 3/4 | 70 1/2 | 73 3/4 | 85 | 65 1/2 | 163 3/8 | 2 1/2 | 147 1/8 | 70 1/2 | 148 3/4 | 161 5/8 | 94 1/8 | 5 | 152 3/8 | 85 | 165 1/4 | 147 1/8 | 190 1/4 |

| Size | T | U | V | W | X | Y | Z - CLASS I | | | | Z - CLASS II | | | | AA | AB | AC | AD | AE | AF | AG | AH | AJ | AK | AL | AM | Max. Mtr. Frame ARR. 9 & 10 |
|------|---------|--------|---------|---------|----------|-------|-------------|------------|---------|------------|--------------|---------|---------|---------|---------|---------|----------|----------|--------|--------|----|---------|------|----|----|----|-----------------------------|
| | | | | | | | SFT | | KWY | | SFT | | KWY | | | | | | | | | | | | | | |
| | | | | | | | ODP & TEFC | | | | | | | | | | | | | | | | | | | | |
| 300 | 48 3/4 | 27 1/2 | 41 | 63 3/8 | 45 7/8 | 5 1/2 | 1 11/16 | 3/8 x 3/16 | 1 15/16 | 1/2 x 1/4 | 56 1/4 | 63 5/16 | 39 | 54 1/2 | 69 5/8 | 45 1/4 | 13 1/4 | 33 1/8 | 16 3/8 | 13 3/8 | 28 | 56 3/4 | 284T | | | | |
| 330 | 53 1/2 | 30 1/4 | 45 | 64 7/8 | 47 1/8 | 5 1/2 | 1 11/16 | 3/8 x 3/16 | 1 15/16 | 1/2 x 1/4 | 61 1/4 | 69 9/16 | 42 7/8 | 65 1/4 | 75 5/8 | 49 | 14 1/2 | 36 1/4 | 18 3/8 | 13 3/8 | 28 | 59 1/4 | 286T | | | | |
| 365 | 59 1/2 | 33 1/2 | 48 | 68 | 48 7/16 | 5 1/2 | 1 11/16 | 3/8 x 3/16 | 1 15/16 | 1/2 x 1/4 | 67 | 77 1/8 | 47 1/2 | 68 1/2 | 83 1/8 | 53 1/2 | 15 13/16 | 40 | 19 7/8 | 13 3/8 | 28 | 61 7/8 | 286T | | | | |
| 402 | 65 1/2 | 37 | 52 | 73 3/4 | 53 1/16 | 5 1/2 | 1 15/16 | 1/2 x 1/4 | 2 3/16 | 1/2 x 1/4 | 74 | 85 1/4 | 52 5/8 | 74 | 91 5/8 | 59 | 17 7/16 | 43 7/8 | 21 7/8 | 14 3/8 | 31 | 68 1/8 | 326T | | | | |
| 445 | 72 3/8 | 40 7/8 | 57 1/2 | 77 3/8 | 54 5/8 | 5 1/2 | 2 3/16 | 1/2 x 1/4 | 2 7/16 | 5/8 x 5/16 | 81 1/2 | 93 1/4 | 57 1/8 | 77 7/8 | 100 3/4 | 64 5/8 | 19 1/4 | 48 3/4 | 23 7/8 | 15 5/8 | 31 | 72 1/4 | 326T | | | | |
| 490 | 79 5/8 | 44 7/8 | 62 | 85 5/8 | 60 | 6 | 2 3/16 | 1/2 x 1/4 | 2 7/16 | 5/8 x 5/16 | 89 3/4 | 102 7/8 | 63 1/8 | 83 7/8 | 110 3/8 | 70 5/8 | 21 1/8 | 53 3/8 | 26 1/8 | 16 5/8 | 34 | 79 | 364T | | | | |
| 542 | 88 1/4 | 49 3/4 | 69 | 92 3/8 | 64 7/8 | 6 | 2 7/16 | 5/8 x 5/16 | 2 11/16 | 5/8 x 5/16 | 98 1/2 | 113 1/4 | 69 1/4 | 93 3/4 | 121 | 77 | 23 1/2 | 59 1/2 | 28 5/8 | 18 1/8 | 37 | 87 3/4 | 365T | | | | |
| 600 | 97 1/2 | 55 | 75 | 98 1/4 | 68 7/16 | 7 | 2 7/16 | 5/8 x 5/16 | 2 11/16 | 5/8 x 5/16 | 109 | 124 7/8 | 76 1/4 | 103 | 133 | 84 3/8 | 25 13/16 | 65 1/2 | 31 5/8 | 18 1/8 | 37 | 92 3/8 | 404T | | | | |
| 660 | 107 | 60 1/2 | 80 | 104 3/4 | 72 1/2 | 7 | 2 7/16 | 5/8 x 5/16 | 2 15/16 | 3/4 x 3/8 | 109 1/2 | 137 3/8 | 84 | 110 | 146 1/8 | 92 3/4 | 28 7/8 | 72 3/8 | 33 1/8 | 33 1/8 | 39 | 10 11/2 | 444T | | | | |
| 730 | 118 5/8 | 67 | 88 | 113 3/4 | 78 13/16 | 7 1/2 | 2 11/16 | 5/8 x 5/16 | 3 7/16 | 7/8 x 7/16 | 121 1/8 | 154 1/2 | 95 3/8 | 121 1/4 | 161 1/8 | 102 | 31 9/16 | 79 3/4 | 37 1/8 | 37 1/8 | 42 | 109 7/8 | 445T | | | | |
| 807 | 130 7/8 | 73 3/4 | 95 1/2 | 123 1/4 | 85 5/16 | 8 | 2 15/16 | 3/4 x 3/8 | 3 7/16 | 7/8 x 7/16 | 133 5/8 | 170 5/8 | 105 3/8 | 133 1/4 | 176 7/8 | 111 5/8 | 34 9/16 | 87 15/16 | 40 7/8 | 40 7/8 | 45 | 118 7/8 | 445T | | | | |
| 890 | 144 5/8 | 81 5/8 | 106 1/2 | 132 1/2 | 91 7/16 | 8 | 3 7/16 | 7/8 x 7/16 | 3 7/16 | 7/8 x 7/16 | 148 | 188 1/2 | 116 1/2 | 147 1/8 | 198 7/8 | 126 7/8 | 37 11/16 | 96 3/8 | 46 3/8 | 46 3/8 | 48 | 128 1/8 | 445T | | | | |

TOLERANCE ± 1/8 Not to be used for construction. Certified drawings available upon request.

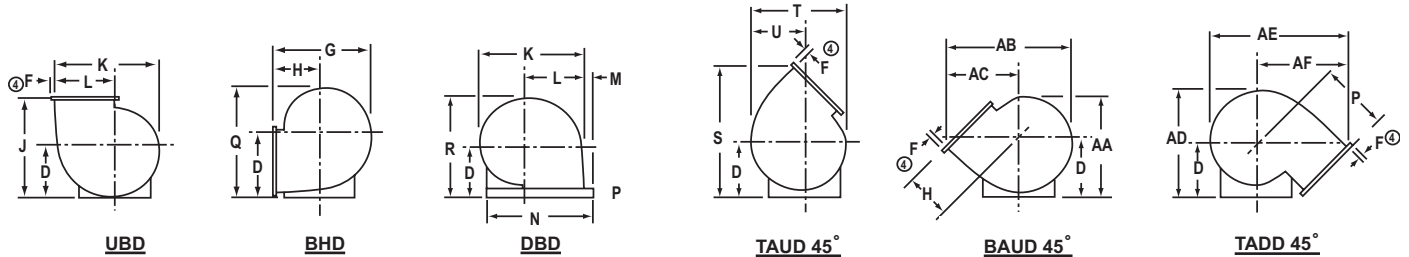
VCR Dimensional Data

BI & AF – Arrangement 10, SWSI, Class I & II



Notes

1. CW rotation shown; CCW rotation similar but opposite.
2. AF available in sizes 300 through 600.
3. BI available in sizes 300 through 600.
4. Discharge angles standard on sizes 402 through 600 only. (Hole punching optional on all sizes.)
5. On specific sales orders, see Fan Data Schedule for performance and accessory information.
6. On DBD sizes 300 through 600, discharge is extended to base.



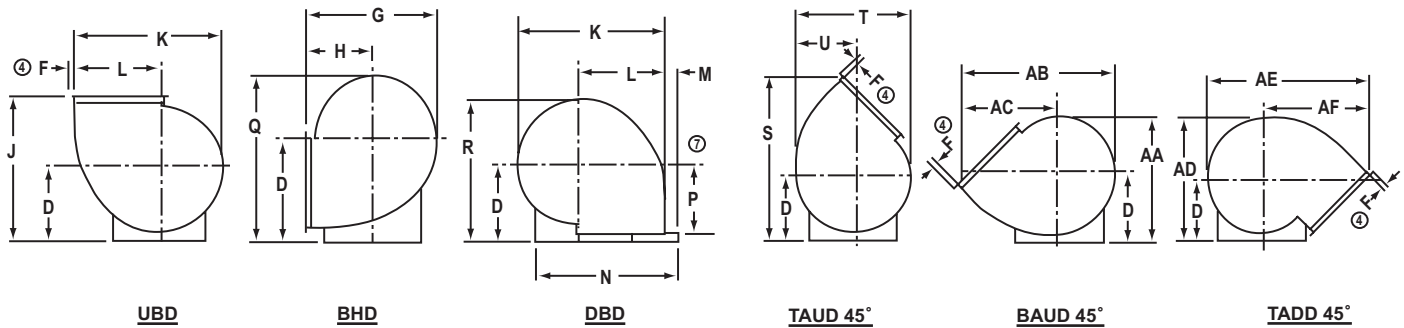
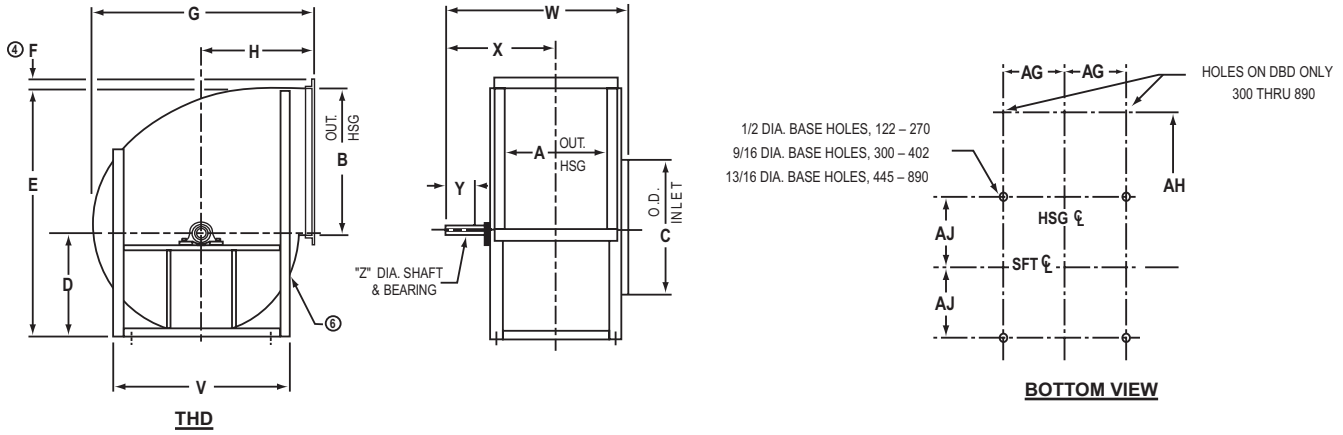
| Size | A | B | C | "D" Centerline of Fan | | | | | | | | E | F | G | H | J | K | L | M | N | P | Q | R | S |
|------|----------|----------|---------|-----------------------|-----|--------|-----|------|--------|------|---------|-------|----------|----------|----------|----------|---------|-------|---------|---------|----------|----------|---------|---|
| | | | | THD | UBD | BHD | DBD | TAUD | BAUD | TADD | | | | | | | | | | | | | | |
| 300 | 23 11/16 | 31 13/16 | 31 5/8 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 66 3/4 | 1 1/2 | 49 1/4 | 23 7/16 | 58 7/16 | 54 1/2 | 31 3/4 | 2 1/2 | 54 3/4 | 32 7/8 | 57 3/4 | 60 13/16 | 74 1/8 | |
| 330 | 26 1/4 | 34 15/16 | 34 3/4 | 35 | 35 | 38 | 35 | 35 | 38 | 35 | 69 7/8 | 1 1/2 | 54 3/16 | 25 13/16 | 60 13/16 | 59 7/8 | 34 7/8 | 2 1/2 | 59 7/8 | 34 9/16 | 63 | 63 3/8 | 77 7/8 | |
| 365 | 28 7/8 | 38 11/16 | 38 1/2 | 35 | 35 | 41 | 35 | 35 | 41 | 35 | 73 5/8 | 1 1/2 | 60 1/8 | 28 5/8 | 63 5/8 | 66 5/16 | 38 5/8 | 2 1/2 | 65 1/8 | 37 1/8 | 68 11/16 | 66 1/2 | 82 5/8 | |
| 402 | 32 1/16 | 42 9/16 | 42 7/16 | 37 | 37 | 45 1/2 | 37 | 37 | 45 1/2 | 37 | 79 1/2 | 2 | 66 11/16 | 32 | 69 | 73 1/16 | 42 1/2 | 2 1/2 | 71 | 41 | 76 1/16 | 71 11/16 | 89 3/8 | |
| 445 | 35 1/4 | 47 3/16 | 46 7/8 | 41 | 41 | 50 | 41 | 41 | 50 | 41 | 88 1/16 | 2 | 72 1/8 | 33 3/4 | 74 3/4 | 80 7/8 | 47 1/16 | 3 | 78 7/8 | 44 | 83 13/16 | 79 3/8 | 98 1/4 | |
| 490 | 39 | 51 13/16 | 51 5/8 | 44 | 44 | 55 | 44 | 44 | 55 | 44 | 95 3/4 | 2 | 79 11/16 | 37 1/2 | 81 1/2 | 88 7/8 | 51 3/4 | 3 | 85 3/4 | 47 3/4 | 92 1/8 | 86 3/16 | 107 1/8 | |
| 542 | 42 3/4 | 57 7/16 | 57 1/8 | 44 | 49 | 60 | 44 | 49 | 60 | 44 | 101 3/8 | 2 | 87 1/4 | 40 1/2 | 89 1/2 | 98 9/16 | 57 3/8 | 4 | 95 7/8 | 51 3/4 | 101 3/16 | 90 3/4 | 118 1/4 | |
| 600 | 47 3/8 | 63 7/16 | 63 1/8 | 48 | 54 | 66 1/2 | 48 | 54 | 66 1/2 | 48 | 111 3/8 | 2 | 96 3/16 | 44 1/2 | 98 1/2 | 108 7/16 | 63 3/8 | 4 | 104 7/8 | 56 | 112 | 99 11/16 | 130 3/8 | |

| Size | T | U | V | W | X | Y | Z - CLASS I | | Z - CLASS II | | AA | AB | AC | AD | AE | AF | AG | AH | AJ | AK | AL | AM | Max Mtr. Frame ARR. 9 & 10 ODP & TEFC |
|------|--------|--------|--------|--------|---------|-------|-------------|------------|--------------|------------|--------|---------|--------|--------|---------|--------|----------|--------|--------|--------|----|--------|---|
| | | | | | | | SFT | KWY | SFT | KWY | | | | | | | | | | | | | |
| 300 | 48 3/4 | 27 1/2 | 41 | 63 3/8 | 45 7/8 | 5 1/2 | 1 11/16 | 3/8 x 3/16 | 1 15/16 | 1/2 x 1/4 | 56 1/4 | 63 5/16 | 39 | 54 1/2 | 69 5/8 | 45 1/4 | 13 1/4 | 33 1/8 | 16 3/8 | 13 3/8 | 28 | 56 3/4 | 284T |
| 330 | 53 1/2 | 30 1/4 | 45 | 64 7/8 | 47 1/8 | 5 1/2 | 1 11/16 | 3/8 x 3/16 | 1 15/16 | 1/2 x 1/4 | 61 1/4 | 69 9/16 | 42 7/8 | 65 1/4 | 75 5/8 | 49 | 14 1/2 | 36 1/4 | 18 3/8 | 13 3/8 | 28 | 59 1/4 | 286T |
| 365 | 59 1/2 | 33 1/2 | 48 | 68 | 48 7/16 | 5 1/2 | 1 11/16 | 3/8 x 3/16 | 1 15/16 | 1/2 x 1/4 | 67 | 77 1/8 | 47 1/2 | 68 1/2 | 83 1/8 | 53 1/2 | 15 13/16 | 40 | 19 7/8 | 13 3/8 | 28 | 61 7/8 | 286T |
| 402 | 65 1/2 | 37 | 52 | 73 3/4 | 53 1/16 | 5 1/2 | 1 15/16 | 1/2 x 1/4 | 2 3/16 | 1/2 x 1/4 | 74 | 85 1/4 | 52 5/8 | 74 | 91 5/8 | 59 | 17 7/16 | 43 7/8 | 21 7/8 | 14 3/8 | 31 | 68 1/8 | 326T |
| 445 | 72 3/8 | 40 7/8 | 57 1/2 | 77 3/8 | 54 5/8 | 5 1/2 | 2 3/16 | 1/2 x 1/4 | 2 7/16 | 5/8 x 5/16 | 81 1/2 | 93 1/4 | 57 1/8 | 77 7/8 | 100 3/4 | 64 5/8 | 19 1/4 | 48 3/4 | 23 7/8 | 15 5/8 | 31 | 72 1/4 | 326T |
| 490 | 79 5/8 | 44 7/8 | 62 | 85 5/8 | 60 | 6 | 2 3/16 | 1/2 x 1/4 | 2 7/16 | 5/8 x 5/16 | 89 3/4 | 102 7/8 | 63 1/8 | 83 7/8 | 110 3/8 | 70 5/8 | 21 1/8 | 53 3/8 | 26 1/8 | 16 5/8 | 34 | 79 | 364T |
| 542 | 88 1/4 | 49 1/4 | 69 | 92 3/8 | 64 7/8 | 6 | 2 7/16 | 5/8 x 5/16 | 2 11/16 | 5/8 x 5/16 | 98 1/2 | 113 1/4 | 69 1/4 | 93 3/4 | 121 | 77 | 23 1/2 | 59 1/2 | 28 5/8 | 18 1/8 | 37 | 87 3/4 | 365T |
| 600 | 97 1/2 | 55 | 75 | 98 1/4 | 68 7/16 | 7 | 2 7/16 | 5/8 x 5/16 | 2 11/16 | 5/8 x 5/16 | 109 | 124 7/8 | 76 1/4 | 103 | 133 | 84 3/8 | 25 13/16 | 65 1/2 | 31 5/8 | 18 1/8 | 37 | 92 3/8 | 404T |

Tolerance ± 1/8 Not to be used for construction. Certified drawings available upon request.

VCR Dimensional Data

BI & AF – Arrangement 3, SWSI, Class I & II



Notes

1. CW rotation shown; CCW rotation similar but opposite.
2. AF available in sizes 182 through 890.
3. BI available in sizes 122 through 890.
4. Discharge angles standard on sizes 402 thru 890 only. (Hole punching optional on all sizes.)
5. On specific sales orders, see Fan Data Schedule for performance and accessory information.
6. On sizes 300 through 890, side bracing is steel angle as shown.
 On sizes 122 through 270, side bracing is formed by 90 breaks in drive side plates and inlet side plates.
7. On DBD sizes 300 thru 890, discharge is extended to base.

VCR Dimensional Data

BI & AF – Arrangement 3, SWSI, Class I & II / Cont.

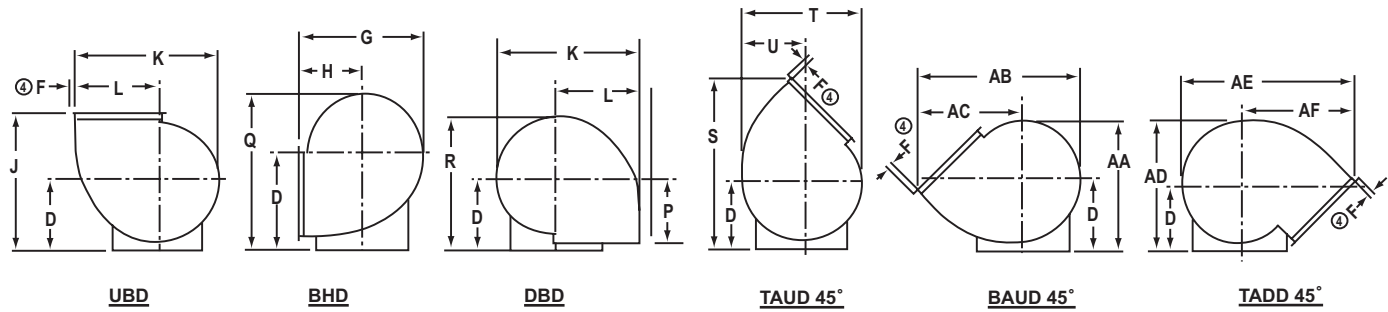
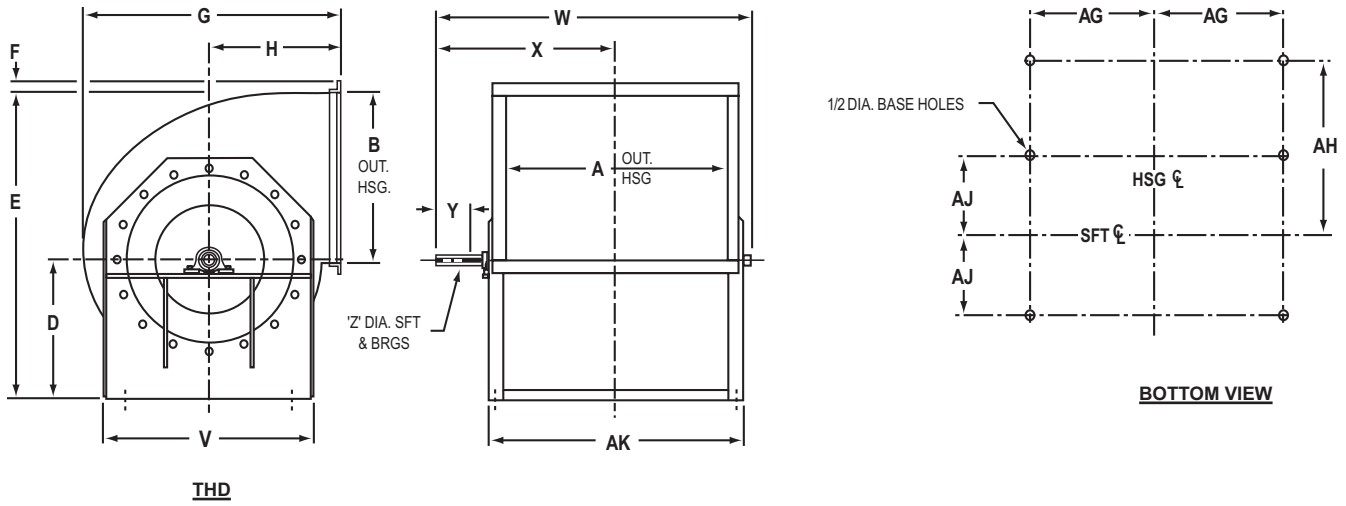
| Size | A | B | C | "D" Centerline of Fan | | | | | | | E | ④ F | G | H | J | K | L | M | N | Ⓐ P | Q | R |
|------|----------|----------|---------|-----------------------|--------|--------|--------|--------|--------|--------|----------|-------|----------|----------|----------|----------|----------|-------|---------|--------|----------|----------|
| | | | | THD | UBD | BHD | DBD | TAUD | BAUD | TADD | | | | | | | | | | | | |
| 122 | 9 3/4 | 13 | 13 1/4 | 11 1/2 | 11 1/2 | 15 | 11 1/2 | 11 1/2 | 15 | 15 | 24 7/16 | 1 1/4 | 20 13/16 | 10 1/4 | 21 3/4 | 22 1/4 | 12 15/16 | - | - | 10 1/4 | 24 5/16 | 22 1/16 |
| 135 | 10 13/16 | 14 5/16 | 14 9/16 | 12 3/4 | 12 3/4 | 16 1/4 | 12 3/4 | 12 3/4 | 16 1/4 | 16 1/4 | 27 | 1 1/4 | 22 7/8 | 11 1/4 | 24 | 24 1/2 | 14 1/4 | - | - | 11 1/4 | 26 1/2 | 24 3/8 |
| 150 | 11 15/16 | 15 7/8 | 16 3/16 | 12 3/4 | 14 | 18 | 12 3/4 | 14 | 18 | 18 | 28 9/16 | 1 1/4 | 25 7/16 | 12 1/2 | 26 1/2 | 27 1/4 | 15 13/16 | - | - | 12 1/2 | 29 7/16 | 25 11/16 |
| 165 | 13 3/16 | 17 3/8 | 17 3/4 | 14 | 15 1/4 | 19 1/2 | 14 | 15 1/4 | 19 1/2 | 19 1/2 | 31 5/16 | 1 1/4 | 28 | 13 3/4 | 29 | 29 7/8 | 17 5/16 | - | - | 13 3/4 | 32 1/16 | 28 1/4 |
| 182 | 14 3/8 | 19 3/8 | 19 1/2 | 15 | 17 | 21 1/2 | 15 | 17 | 21 1/2 | 21 1/2 | 34 5/16 | 1 1/4 | 30 3/16 | 14 1/2 | 31 1/2 | 33 1/8 | 19 5/16 | - | - | 14 1/2 | 35 5/16 | 30 11/16 |
| 200 | 16 | 21 1/4 | 21 3/8 | 16 1/4 | 20 | 23 1/2 | 16 1/4 | 20 | 20 | 20 | 37 7/16 | 1 1/4 | 32 7/8 | 15 5/8 | 35 5/8 | 36 3/8 | 21 3/16 | - | - | 15 5/8 | 38 11/16 | 33 1/2 |
| 222 | 17 1/2 | 23 5/8 | 23 3/4 | 18 | 20 1/2 | 26 | 18 | 20 1/2 | 26 | 20 1/2 | 41 9/16 | 1 1/4 | 36 5/8 | 17 1/2 | 38 | 40 7/16 | 23 9/16 | - | - | 17 1/2 | 42 7/8 | 37 1/8 |
| 245 | 19 1/2 | 25 15/16 | 26 1/16 | 20 | 22 1/2 | 28 | 20 | 22 1/2 | 28 | 22 1/2 | 45 7/8 | 1 1/4 | 40 5/16 | 19 1/4 | 41 3/4 | 44 7/16 | 25 7/8 | - | - | 19 1/4 | 46 9/16 | 41 1/16 |
| 270 | 21 9/16 | 28 5/8 | 28 1/2 | 22 | 24 3/4 | 31 | 22 | 24 3/4 | 31 | 24 3/4 | 50 9/16 | 1 1/4 | 44 5/16 | 21 1/8 | 45 7/8 | 49 | 28 9/16 | - | - | 21 1/8 | 51 7/16 | 45 3/16 |
| 300 | 23 11/16 | 31 13/16 | 31 5/8 | 24 | 27 | 35 | 24 | 26 | 29 1/2 | 26 | 55 3/4 | 1 1/2 | 49 1/4 | 23 7/16 | 50 7/16 | 54 1/2 | 31 3/4 | 2 1/2 | 54 1/4 | 24 | 57 3/4 | 49 13/16 |
| 330 | 26 1/4 | 34 15/16 | 34 3/4 | 27 | 30 | 38 | 26 1/2 | 28 1/2 | 32 1/2 | 28 | 61 7/8 | 1 1/2 | 54 3/16 | 25 13/16 | 55 13/16 | 59 7/8 | 34 7/8 | 2 1/2 | 59 3/8 | 26 1/2 | 63 | 54 7/8 |
| 365 | 28 7/8 | 38 11/16 | 38 1/2 | 29 1/2 | 33 1/2 | 41 | 29 | 31 1/2 | 35 1/2 | 29 1/2 | 68 1/8 | 1 1/2 | 60 1/8 | 28 5/8 | 62 1/8 | 66 5/16 | 38 5/8 | 2 1/2 | 64 5/8 | 29 | 68 11/16 | 60 1/2 |
| 402 | 32 1/16 | 42 9/16 | 42 7/16 | 32 1/2 | 36 1/2 | 45 1/2 | 32 | 35 | 39 1/2 | 32 | 75 | 2 | 66 11/16 | 32 | 68 1/2 | 73 1/16 | 42 1/2 | 2 1/2 | 70 1/2 | 32 | 76 1/16 | 66 11/16 |
| 445 | 35 1/4 | 47 3/16 | 46 7/8 | 35 1/2 | 40 | 50 | 34 | 38 | 43 | 36 | 82 9/16 | 2 | 72 1/8 | 33 3/4 | 73 3/4 | 80 7/8 | 47 1/16 | 3 1/2 | 79 5/16 | 34 | 83 13/16 | 72 3/8 |
| 490 | 39 | 51 13/16 | 51 5/8 | 39 | 44 | 55 | 37 1/2 | 42 | 47 | 38 | 90 3/4 | 2 | 79 11/16 | 37 1/2 | 81 1/2 | 88 7/8 | 51 3/4 | 3 1/2 | 86 1/4 | 37 1/2 | 92 1/8 | 79 11/16 |
| 542 | 42 3/4 | 57 7/16 | 57 1/8 | 43 1/2 | 49 | 60 | 40 1/2 | 46 | 52 | 42 | 100 7/8 | 2 | 87 1/4 | 40 1/2 | 89 1/2 | 98 9/16 | 57 3/8 | 3 1/2 | 94 7/8 | 40 1/2 | 10 13/16 | 87 1/4 |
| 600 | 47 3/8 | 63 7/16 | 63 1/8 | 48 | 54 | 66 1/2 | 44 1/2 | 51 | 57 | 45 | 111 3/8 | 2 | 96 3/16 | 44 1/2 | 98 1/2 | 108 7/8 | 63 3/8 | 3 1/2 | 103 7/8 | 44 1/2 | 112 | 96 3/16 |
| 660 | 52 1/2 | 69 13/16 | 69 3/8 | 52 1/2 | 59 | 73 1/4 | 49 | 55 3/4 | 63 | 49 1/2 | 122 1/4 | 2 1/2 | 105 3/4 | 49 | 108 | 119 5/8 | 69 3/4 | 5 | 114 3/4 | 49 | 123 1/8 | 105 3/4 |
| 730 | 57 7/8 | 77 1/4 | 76 3/4 | 57 | 64 1/4 | 80 3/4 | 57 3/4 | 61 3/4 | 69 1/2 | 54 1/4 | 134 1/8 | 2 1/2 | 120 5/8 | 57 3/4 | 122 1/4 | 132 1/2 | 77 1/8 | 5 | 126 1/8 | 57 3/4 | 136 1/8 | 120 5/8 |
| 807 | 63 13/16 | 85 7/16 | 84 7/8 | 63 | 72 | 89 | 63 3/4 | 67 1/2 | 76 1/2 | 59 1/2 | 148 5/16 | 2 1/2 | 133 5/16 | 63 3/4 | 135 3/4 | 146 9/16 | 85 5/16 | 5 | 138 1/8 | 63 3/4 | 150 1/4 | 133 5/16 |
| 890 | 70 1/8 | 94 1/4 | 93 3/8 | 69 1/4 | 78 1/4 | 97 3/4 | 70 1/2 | 73 3/4 | 85 | 65 1/2 | 163 3/8 | 2 1/2 | 147 1/8 | 70 1/2 | 148 3/4 | 161 5/8 | 94 1/8 | 5 | 152 3/8 | 70 1/2 | 165 1/4 | 147 1/8 |

| Size | S | T | U | V | CLASS I | | CLASS II | | Y | "Z" - CLASS I | | "Z" - CLASS II | | AA | AB | AC | AD | AE | AF | AG | AH | AJ |
|------|----------|---------|----------|---------|---------|----------|----------|---------|-------|---------------|------------|----------------|------------|----------|----------|----------|----------|---------|---------|----------|----------|--------|
| | | | | | W | X | W | X | | SFT | KWY | SFT | KWY | | | | | | | | | |
| | | | | | 122 | 27 15/16 | 19 7/8 | 11 3/16 | | 16 | 19 1/2 | 101 5/16 | 21 7/8 | | | | | | | | | |
| 135 | 30 3/4 | 21 7/8 | 12 5/16 | 17 1/2 | 20 1/2 | 11 7/16 | 22 7/8 | 12 5/8 | 2 1/2 | 1 | 1/4 x 1/8 | 1 3/16 | 1/4 x 1/8 | 25 13/16 | 28 15/16 | 18 | 28 9/16 | 34 5/16 | 23 3/8 | 6 11/16 | - | 7 1/4 |
| 150 | 34 | 24 5/16 | 13 11/16 | 19 | 22 1/8 | 12 1/2 | 24 1/2 | 13 3/4 | 3 | 1 | 1/4 x 1/8 | 13/16 | 1/4 x 1/8 | 28 5/8 | 32 3/16 | 20 | 31 11/16 | 37 7/16 | 25 1/4 | 7 1/4 | - | 8 |
| 165 | 37 1/4 | 26 3/4 | 15 1/16 | 20 1/2 | 23 7/8 | 13 3/8 | 26 7/8 | 15 | 3 | 1 | 1/4 x 1/8 | 1 7/16 | 3/8 x 3/16 | 31 3/16 | 35 3/8 | 22 | 34 1/16 | 40 3/8 | 27 | 7 7/8 | - | 8 5/8 |
| 182 | 40 15/16 | 29 5/8 | 16 5/8 | 22 1/2 | 28 | 15 3/4 | 28 1/2 | 16 1/16 | 3 1/2 | 1 3/16 | 1/4 x 1/8 | 11 1/16 | 3/8 x 3/16 | 34 1/2 | 38 11/16 | 23 15/16 | 38 1/8 | 44 1/8 | 29 3/8 | 8 11/16 | - | 9 5/8 |
| 200 | 46 1/16 | 32 1/2 | 18 1/4 | 25 | 29 5/8 | 16 1/2 | 30 1/8 | 16 7/8 | 3 1/2 | 1 3/16 | 1/4 x 1/8 | 11 1/16 | 3/8 x 3/16 | 34 1/4 | 42 1/4 | 26 1/16 | 38 1/4 | 47 5/8 | 31 7/16 | 9 1/2 | - | 10 7/8 |
| 222 | 49 1/2 | 36 | 20 3/8 | 27 1/4 | 31 5/8 | 17 3/4 | 32 1/8 | 18 1/8 | 4 | 1 3/16 | 1/4 x 1/8 | 11 1/16 | 3/8 x 3/16 | 41 5/8 | 47 | 29 | 40 7/8 | 52 1/2 | 34 1/2 | 10 1/4 | - | 11 1/8 |
| 245 | 54 1/2 | 39 3/4 | 22 3/8 | 29 3/4 | 34 1/4 | 19 1/8 | 34 1/8 | 19 1/8 | 4 | 1 7/16 | 3/8 x 3/16 | 11 1/16 | 3/8 x 3/16 | 45 3/8 | 51 3/4 | 32 | 44 7/8 | 57 7/16 | 37 5/8 | 11 1/4 | - | 11 1/8 |
| 270 | 60 3/4 | 43 3/4 | 24 3/4 | 33 | 36 1/4 | 20 3/16 | 36 1/4 | 20 3/16 | 4 | 11 1/16 | 3/8 x 3/16 | 11 1/16 | 3/8 x 3/16 | 50 | 56 15/16 | 35 1/8 | 49 1/2 | 62 7/16 | 40 5/8 | 12 5/16 | - | 13 1/8 |
| 300 | 65 1/8 | 48 3/4 | 27 1/2 | 40 | 38 1/4 | 21 1/8 | 38 5/8 | 21 3/8 | 4 | 11 1/16 | 3/8 x 3/16 | 11 5/16 | 1/2 x 1/4 | 50 3/4 | 63 5/16 | 39 | 53 1/2 | 69 5/8 | 45 1/4 | 13 1/4 | 33 1/8 | 16 7/8 |
| 330 | 71 3/8 | 53 1/2 | 30 1/4 | 44 | 40 7/8 | 22 3/8 | 41 1/4 | 22 5/8 | 4 | 11 1/16 | 3/8 x 3/16 | 11 5/16 | 1/2 x 1/4 | 55 3/4 | 69 9/16 | 42 7/8 | 58 1/4 | 75 5/8 | 49 | 141 1/2 | 36 1/4 | 18 7/8 |
| 365 | 79 1/8 | 59 1/2 | 33 1/2 | 47 | 44 1/2 | 24 3/4 | 44 7/8 | 25 | 5 | 11 1/16 | 3/8 x 3/16 | 11 5/16 | 1/2 x 1/4 | 61 1/2 | 77 1/4 | 47 5/8 | 63 | 83 1/8 | 53 1/2 | 15 13/16 | 40 | 20 3/8 |
| 402 | 87 3/8 | 65 1/2 | 37 | 51 | 49 | 27 | 49 5/8 | 27 3/8 | 5 | 11 5/16 | 1/2 x 1/4 | 2 3/16 | 1/2 x 1/4 | 68 | 85 3/8 | 52 3/4 | 69 | 92 1/4 | 59 5/8 | 17 7/16 | 43 7/8 | 22 3/8 |
| 445 | 95 1/4 | 72 3/8 | 40 7/8 | 57 1/2 | 52 3/4 | 29 1/8 | 53 3/8 | 29 1/2 | 5 1/2 | 11 5/16 | 1/2 x 1/4 | 2 3/16 | 1/2 x 1/4 | 74 1/2 | 93 3/8 | 57 1/4 | 76 7/8 | 100 3/4 | 64 5/8 | 19 1/2 | 48 15/16 | 23 5/8 |
| 490 | 105 1/8 | 79 5/8 | 44 7/8 | 62 | 57 | 31 3/8 | 57 3/4 | 31 7/8 | 5 1/2 | 2 3/16 | 1/2 x 1/4 | 2 7/16 | 5/8 x 5/16 | 81 3/4 | 102 7/8 | 63 1/8 | 82 7/8 | 110 3/8 | 70 5/8 | 21 3/8 | 53 5/8 | 25 7/8 |
| 542 | 115 1/4 | 88 1/4 | 49 3/4 | 68 | 62 | 34 3/16 | 62 1/8 | 34 1/4 | 6 | 2 7/16 | 5/8 x 5/16 | 2 11/16 | 5/8 x 5/16 | 90 1/2 | 113 1/4 | 69 1/4 | 91 3/4 | 121 | 77 | 23 1/4 | 59 1/4 | 28 7/8 |
| 600 | 127 3/8 | 97 1/2 | 55 | 74 | 67 5/8 | 37 | 67 7/8 | 37 1/4 | 6 | 2 7/16 | 5/8 x 5/16 | 2 15/16 | 3/4 x 3/8 | 99 1/2 | 125 | 76 3/8 | 100 | 133 1/8 | 84 1/2 | 25 9/16 | 65 1/4 | 31 7/8 |
| 660 | 139 3/4 | 107 | 60 1/2 | 80 | 75 7/8 | 41 5/8 | 77 5/8 | 42 3/4 | 7 | 2 11/16 | 5/8 x 5/16 | 3 7/16 | 7/8 x 7/16 | 109 1/2 | 137 3/8 | 84 | 110 | 146 1/8 | 92 3/4 | 28 7/8 | 72 3/8 | 33 1/8 |
| 730 | 157 1/8 | 118 5/8 | 67 | 88 | 81 7/8 | 45 | 83 1/2 | 46 | 7 1/2 | 2 15/16 | 3/4 x 3/8 | 3 7/16 | 7/8 x 7/16 | 121 1/8 | 154 1/2 | 95 3/8 | 121 1/4 | 161 1/8 | 102 | 31 9/16 | 79 3/4 | 37 1/8 |
| 807 | 172 7/8 | 130 7/8 | 73 3/4 | 95 1/2 | 88 3/8 | 48 1/2 | 89 7/8 | 49 1/2 | 8 | 2 15/16 | 3/4 x 3/8 | 3 7/16 | 7/8 x 7/16 | 133 5/8 | 170 5/8 | 105 3/8 | 133 1/4 | 176 7/8 | 111 5/8 | 34 9/16 | 87 15/16 | 40 7/8 |
| 890 | 190 1/4 | 144 5/8 | 81 5/8 | 106 1/2 | 96 1/4 | 52 5/8 | 96 5/8 | 52 3/4 | 8 | 3 7/16 | 7/8 x 7/16 | 3 15/16 | 1 x 1/2 | 148 | 188 3/8 | 116 1/2 | 147 1/8 | 198 7/8 | 126 7/8 | 37 11/16 | 96 3/4 | 46 3/8 |

TOLERANCE ± 1/8 Not to be used for construction. Certified drawings available upon request.

VCR Dimensional Data

BI & AF – Arrangement 3, DWDI, Class I & II



Notes

1. CW rotation shown; CCW rotation similar but opposite.
2. AF available in sizes 182 through 270.
3. BI available in sizes 122 through 170.
4. Discharge angles standard on sizes 122 thru 270 only. (Hole punching optional on all sizes.)
5. On specific sales orders, see Fan Data Schedule for performance and accessory information.

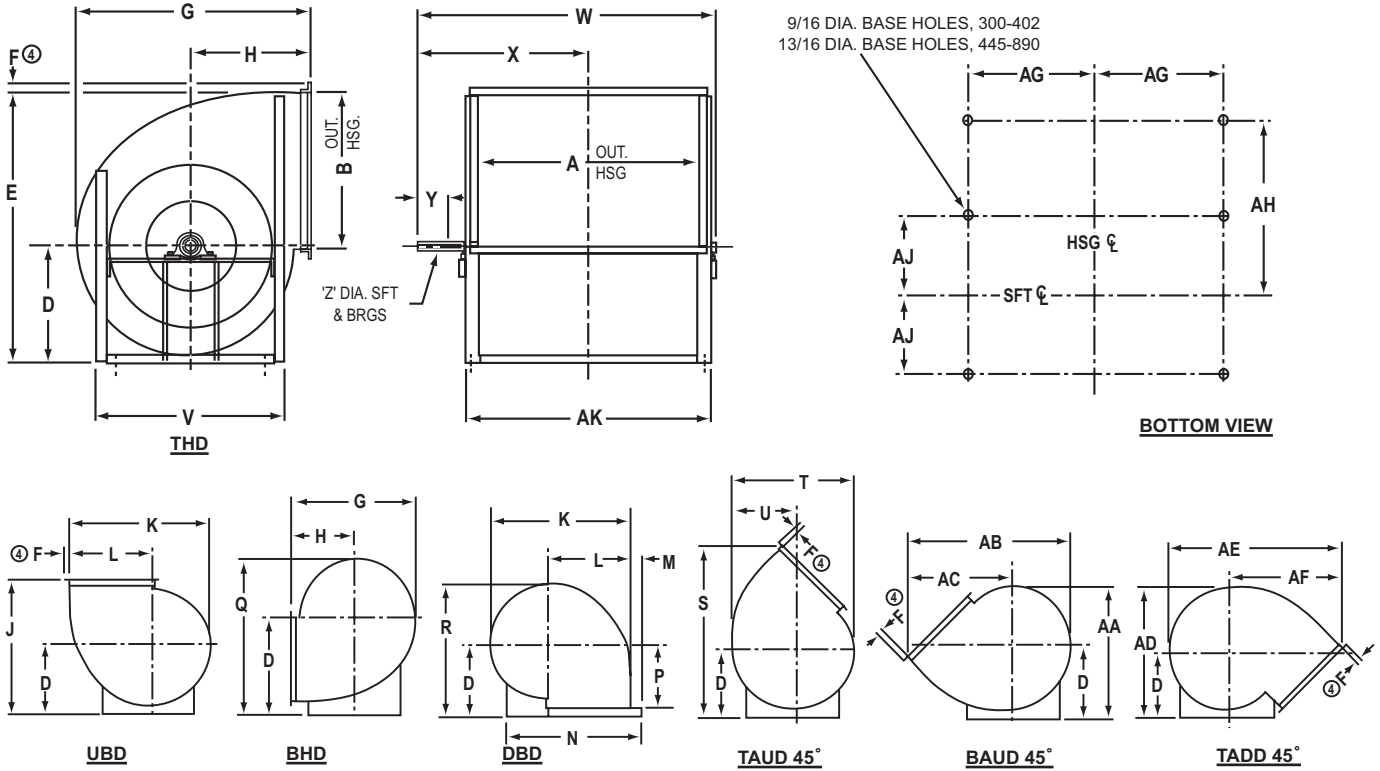
| Size | A | B | "D" CENTERLINE OF FAN | | | | | | | E | F | G | H | J | K | L | M | N | P | Q | R | S | T |
|------|----------|----------|-----------------------|--------|--------|--------|--------|--------|--------|---------|-------|----------|--------|--------|---------|----------|---|---|--------|----------|----------|----------|---------|
| | | | THD | UBD | BHD | DBD | TAUD | BAUD | TADD | | | | | | | | | | | | | | |
| 122 | 17 1/2 | 13 | 11 1/2 | 11 1/2 | 15 | 11 1/2 | 11 1/2 | 15 | 15 | 24 7/16 | 1 1/4 | 20 13/16 | 10 1/4 | 21 3/4 | 22 1/4 | 12 15/16 | — | — | 10 1/4 | 24 5/16 | 22 1/16 | 27 15/16 | 19 7/8 |
| 135 | 19 3/8 | 14 5/16 | 12 3/4 | 12 3/4 | 16 1/4 | 12 3/4 | 12 3/4 | 16 1/4 | 16 1/4 | 27 | 1 1/4 | 22 7/8 | 11 1/4 | 24 | 24 1/2 | 14 1/4 | — | — | 11 1/4 | 26 1/2 | 24 3/8 | 30 3/4 | 21 7/8 |
| 150 | 21 1/4 | 15 7/8 | 12 3/4 | 14 | 18 | 12 3/4 | 14 | 18 | 18 | 28 9/16 | 1 1/4 | 25 7/16 | 12 1/2 | 26 1/2 | 27 1/4 | 15 13/16 | — | — | 12 1/2 | 29 7/16 | 25 11/16 | 34 | 24 5/16 |
| 165 | 23 5/8 | 17 3/8 | 14 | 15 1/4 | 19 1/2 | 14 | 15 1/4 | 19 1/2 | 19 1/2 | 31 5/16 | 1 1/4 | 28 | 13 3/4 | 29 | 29 7/8 | 17 5/16 | — | — | 13 3/4 | 32 1/16 | 28 1/4 | 37 1/4 | 26 3/4 |
| 182 | 25 13/16 | 19 3/8 | 15 | 17 | 21 1/2 | 15 | 17 | 21 1/2 | 21 1/2 | 34 5/16 | 1 1/4 | 30 3/16 | 14 1/2 | 31 1/2 | 33 1/8 | 19 5/16 | — | — | 14 1/2 | 35 5/16 | 30 11/16 | 40 15/16 | 29 5/8 |
| 200 | 28 11/16 | 21 1/4 | 16 1/4 | 20 | 23 1/2 | 16 1/4 | 20 | 20 | 20 | 37 7/16 | 1 1/4 | 32 7/8 | 15 5/8 | 35 5/8 | 36 3/8 | 21 3/16 | — | — | 15 5/8 | 38 11/16 | 33 1/2 | 46 1/16 | 32 1/2 |
| 222 | 31 3/8 | 23 5/8 | 18 | 20 1/2 | 26 | 18 | 20 1/2 | 26 | 20 1/2 | 41 9/16 | 1 1/4 | 36 5/8 | 17 1/2 | 38 | 40 7/16 | 23 9/16 | — | — | 17 1/2 | 42 7/8 | 37 1/8 | 49 1/2 | 36 |
| 245 | 34 7/8 | 25 15/16 | 20 | 22 1/2 | 28 | 20 | 22 1/2 | 28 | 22 1/2 | 45 7/8 | 1 1/4 | 40 5/16 | 19 1/4 | 41 3/4 | 44 7/16 | 25 7/8 | — | — | 19 1/4 | 46 9/16 | 41 1/16 | 54 1/2 | 39 3/4 |
| 270 | 38 5/16 | 28 5/8 | 22 | 24 3/4 | 31 | 22 | 24 3/4 | 31 | 24 3/4 | 50 9/16 | 1 1/4 | 44 5/16 | 21 1/8 | 45 7/8 | 49 | 28 9/16 | — | — | 21 1/8 | 51 7/16 | 45 3/16 | 60 3/4 | 43 3/4 |

| Size | U | V | CLASS I | | CLASS II | | Y | "Z" CLASS I | | | "Z" CLASS II | | | AA | AB | AC | AD | AE | AF | AG | AH | AJ | AK |
|------|----------|--------|---------|--------|----------|--------|-------|-------------|----------|------------|--------------|----------|------------|----------|----------|----------|----------|----------|---------|----------|----|--------|--------|
| | | | W | X | W | X | | SFT | DR. EXT. | KWY | SFT | DR. EXT. | KWY | | | | | | | | | | |
| | | | W | X | W | X | | SFT | DR. EXT. | KWY | SFT | DR. EXT. | KWY | | | | | | | | | | |
| 122 | 11 3/16 | 16 | 26 1/2 | 15 3/8 | 28 5/8 | 16 5/8 | 3 | 1 3/16 | 1 3/16 | 1/4 x 1/8 | 1 7/16 | 1 7/16 | 3/8 x 3/16 | 23 11/16 | 26 3/8 | 16 7/16 | 26 3/16 | 31 11/16 | 21 3/4 | 10 | — | 6 5/8 | 21 3/4 |
| 135 | 12 5/16 | 17 1/2 | 28 1/4 | 16 1/4 | 30 1/2 | 17 1/2 | 3 | 1 3/16 | 1 3/16 | 1/4 x 1/8 | 1 11/16 | 1 11/16 | 3/8 x 3/16 | 25 13/16 | 28 15/16 | 18 | 28 9/16 | 34 5/16 | 23 3/8 | 11 | — | 7 1/4 | 23 3/4 |
| 150 | 13 11/16 | 19 | 33 3/8 | 19 1/4 | 33 3/8 | 19 1/4 | 3 1/2 | 1 7/16 | 1 7/16 | 3/8 x 3/16 | 1 11/16 | 1 11/16 | 3/8 x 3/16 | 28 5/8 | 32 3/16 | 20 | 31 11/16 | 37 7/16 | 25 1/4 | 11 15/16 | — | 8 | 25 5/8 |
| 165 | 15 1/16 | 20 1/2 | 35 3/4 | 20 3/8 | 36 1/8 | 20 5/8 | 3 1/2 | 1 7/16 | 1 7/16 | 3/8 x 3/16 | 1 15/16 | 1 15/16 | 1/2 x 1/4 | 31 3/16 | 35 3/8 | 22 | 34 9/16 | 40 3/8 | 27 | 13 1/8 | — | 8 5/8 | 28 |
| 182 | 16 5/8 | 22 1/2 | 39 | 22 1/4 | 42 7/8 | 22 7/8 | 4 | 1 11/16 | 1 11/16 | 3/8 x 3/16 | 2 3/16 | 2 3/16 | 1/2 x 1/4 | 34 1/2 | 38 11/16 | 23 15/16 | 38 1/8 | 44 1/8 | 29 3/8 | 14 1/2 | — | 9 5/8 | 31 1/4 |
| 200 | 18 1/4 | 25 | 41 7/8 | 23 3/4 | 42 7/8 | 24 1/4 | 4 | 1 11/16 | 1 11/16 | 3/8 x 3/16 | 2 3/16 | 2 3/16 | 1/2 x 1/4 | 34 1/4 | 42 1/4 | 26 1/16 | 38 1/4 | 47 5/8 | 31 7/16 | 15 15/16 | — | 10 7/8 | 34 1/8 |
| 222 | 20 3/8 | 27 1/4 | 45 3/8 | 25 3/4 | 46 5/8 | 26 5/8 | 4 1/2 | 1 15/16 | 1 15/16 | 1/2 x 1/4 | 2 7/16 | 2 7/16 | 5/8 x 5/16 | 41 5/8 | 47 | 29 | 40 7/8 | 52 1/2 | 34 1/2 | 17 1/4 | — | 11 1/8 | 36 3/4 |
| 245 | 22 3/8 | 29 3/4 | 50 1/2 | 28 5/8 | 51 1/8 | 29 1/8 | 5 | 2 3/16 | 2 3/16 | 1/2 x 1/4 | 2 7/16 | 2 7/16 | 5/8 x 5/16 | 45 3/8 | 51 3/4 | 32 | 44 7/8 | 57 7/16 | 37 5/8 | 19 | — | 11 1/8 | 40 1/4 |
| 270 | 24 3/4 | 33 | 54 | 30 3/8 | 54 5/8 | 30 7/8 | 5 | 2 3/16 | 2 3/16 | 1/2 x 1/4 | 2 11/16 | 2 11/16 | 5/8 x 5/16 | 50 | 56 15/16 | 35 1/8 | 49 1/2 | 62 7/16 | 40 5/8 | 20 3/4 | — | 13 1/8 | 43 3/4 |

Tolerance ± 1/8 Not to be used for construction. Certified drawings available upon request.

VCR Dimensional Data

BI & AF – Arrangement 3, DWDI Class I & II



Notes

1. CW rotation shown; CCW rotation similar but opposite.
2. AF available in sizes 182 through 890.
3. BI available in sizes 122 through 890.
4. Discharge angles standard on sizes 402 thru 890 only. (Hole punching optional on all sizes.)
5. On specific sales orders, see Fan Data Schedule for performance and accessory information.
6. On DBD, discharge is extended to base.
7. *Shaft smaller on BI.

| Size | A | B | "D" CENTERLINE OF FAN | | | | | | | E | F | G | H | J | K | L | M | N | P | Q | R | S | T |
|------|-----------|----------|-----------------------|--------|--------|--------|--------|--------|--------|----------|-------|----------|----------|----------|----------|---------|-------|---------|--------|----------|----------|---------|---------|
| | | | THD | UBD | BHD | DBD | TAUD | BAUD | TADD | | | | | | | | | | | | | | |
| 300 | 42 7/16 | 31 13/16 | 24 | 27 | 35 | 24 | 26 | 29 1/2 | 26 | 55 3/4 | 1 1/2 | 49 1/4 | 23 7/16 | 50 7/16 | 54 1/2 | 31 3/4 | 2 1/2 | 54 1/4 | 24 | 57 3/4 | 49 13/16 | 65 1/8 | 48 3/4 |
| 330 | 47 3/16 | 34 15/16 | 27 | 30 | 38 | 26 1/2 | 28 1/2 | 32 1/2 | 28 | 61 7/8 | 1 1/2 | 54 3/16 | 25 13/16 | 55 13/16 | 59 7/8 | 34 7/8 | 2 1/2 | 59 3/8 | 26 1/2 | 63 | 54 7/8 | 71 3/8 | 53 1/2 |
| 365 | 51 3/4 | 38 11/16 | 29 1/2 | 33 1/2 | 41 | 29 | 31 1/2 | 35 1/2 | 29 1/2 | 68 1/8 | 1 1/2 | 60 1/8 | 28 5/8 | 62 1/8 | 66 5/16 | 38 5/8 | 2 1/2 | 64 5/8 | 29 | 68 11/16 | 60 1/2 | 79 1/8 | 59 1/2 |
| 402 | 57 1/2 | 42 9/16 | 32 1/2 | 36 1/2 | 45 1/2 | 32 | 35 | 39 1/2 | 32 | 75 | 2 | 66 11/16 | 32 | 68 1/2 | 73 1/16 | 42 1/2 | 2 1/2 | 70 1/2 | 32 | 76 1/16 | 66 11/16 | 87 3/8 | 65 1/2 |
| 445 | 63 1/4 | 47 3/16 | 35 1/2 | 40 | 50 | 34 | 38 | 43 | 36 | 82 9/16 | 2 | 72 1/8 | 33 3/4 | 73 3/4 | 80 7/8 | 47 1/16 | 3 1/2 | 79 5/16 | 34 | 83 13/16 | 72 3/8 | 95 1/4 | 72 3/8 |
| 490 | 70 | 51 13/16 | 39 | 44 | 55 | 37 1/2 | 42 | 47 | 38 | 90 3/4 | 2 | 79 11/16 | 37 1/2 | 81 1/2 | 88 7/8 | 51 3/4 | 3 1/2 | 86 1/4 | 37 1/2 | 92 1/8 | 79 11/16 | 105 1/8 | 79 5/8 |
| 542 | 77 | 57 7/16 | 43 1/2 | 49 | 60 | 40 1/2 | 46 | 52 | 42 | 100 7/8 | 2 | 87 1/4 | 40 1/2 | 89 1/2 | 98 9/16 | 57 3/8 | 3 1/2 | 94 7/8 | 40 1/2 | 101 3/16 | 87 1/4 | 115 1/4 | 88 1/4 |
| 600 | 85 1/8 | 63 7/16 | 48 | 54 | 66 1/2 | 44 1/2 | 51 | 57 | 45 | 111 3/8 | 2 | 96 3/16 | 44 1/2 | 98 1/2 | 108 7/8 | 63 3/8 | 3 1/2 | 103 7/8 | 44 1/2 | 112 | 96 3/16 | 127 3/8 | 97 1/2 |
| 660 | 94 1/4 | 69 13/16 | 52 1/2 | 59 | 73 1/4 | 49 | 55 3/4 | 63 | 49 1/2 | 122 1/4 | 2 1/2 | 105 3/4 | 49 | 108 | 119 5/8 | 69 3/4 | 5 | 114 3/4 | 49 | 123 1/8 | 105 3/4 | 139 3/4 | 107 |
| 730 | 104 | 77 1/4 | 57 | 64 1/4 | 80 3/4 | 57 3/4 | 61 3/4 | 69 1/2 | 54 1/4 | 134 1/8 | 2 1/2 | 120 5/8 | 57 3/4 | 122 1/4 | 132 1/2 | 77 1/8 | 5 | 126 1/8 | 57 3/4 | 136 1/8 | 120 5/8 | 157 1/8 | 118 5/8 |
| 807 | 114 11/16 | 85 7/16 | 63 | 72 | 89 | 63 3/4 | 67 1/2 | 76 1/2 | 59 1/2 | 148 5/16 | 2 1/2 | 133 5/16 | 63 3/4 | 135 3/4 | 146 9/16 | 85 5/16 | 5 | 138 1/8 | 63 3/4 | 150 1/4 | 133 5/16 | 172 7/8 | 130 7/8 |
| 890 | 126 3/8 | 94 1/4 | 69 1/4 | 78 1/4 | 97 3/4 | 70 1/2 | 73 3/4 | 85 | 65 1/2 | 163 3/8 | 2 1/2 | 147 1/8 | 70 1/2 | 148 3/4 | 161 5/8 | 94 1/8 | 5 | 152 3/8 | 70 1/2 | 165 1/4 | 147 1/8 | 190 1/4 | 144 5/8 |

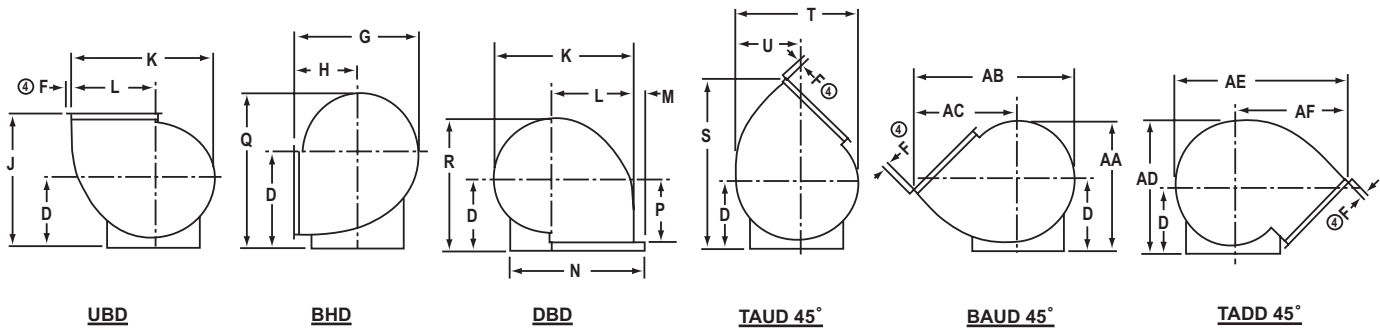
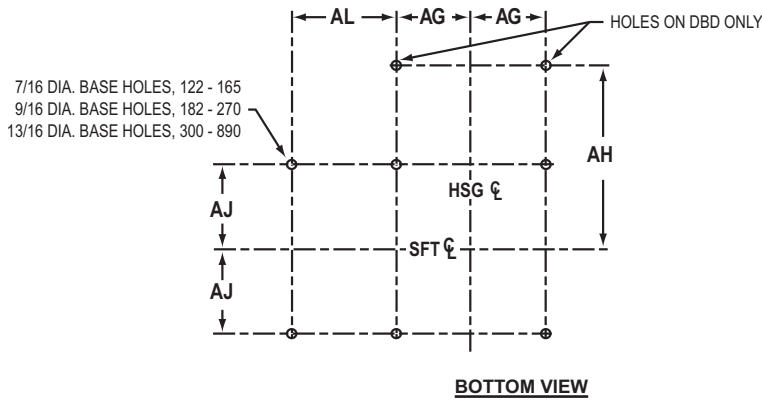
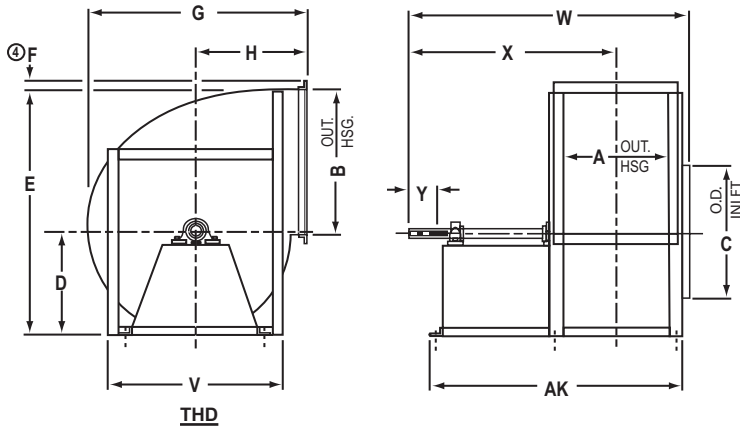
| Size | U | V | CLASS I | | CLASS II | | Y | "Z" CLASS I | | | "Z" CLASS II | | | AA | AB | AC | AD | AE | AF | AG | AH | AJ | AK |
|------|--------|---------|---------|--------|----------|--------|-------|-------------|----------|------------|--------------|----------|------------|---------|---------|---------|---------|---------|---------|----------|----------|--------|-----------|
| | | | W | X | W | X | | SFT | DR. EXT. | KWY | SFT | DR. EXT. | KWY | | | | | | | | | | |
| 300 | 27 1/2 | 40 | 59 7/8 | 33 3/4 | 60 | 33 3/4 | 5 1/2 | 2 7/16 | 2 7/16 | 5/8 x 5/16 | 2 11/16 | 2 11/16 | 5/8 x 5/16 | 50 3/4 | 63 5/16 | 39 | 53 1/2 | 69 5/8 | 45 1/4 | 22 5/8 | 33 1/8 | 16 7/8 | 47 7/16 |
| 330 | 30 1/4 | 44 | 63 5/8 | 35 5/8 | 63 5/8 | 35 5/8 | 5 1/2 | 2 7/16 | 2 7/16 | 5/8 x 5/16 | 2 15/16 | 2 7/16 | 5/8 x 5/16 | 55 3/4 | 69 9/16 | 42 7/8 | 58 1/4 | 75 5/8 | 49 | 25 | 36 1/4 | 18 7/8 | 52 3/16 |
| 365 | 33 1/2 | 47 | 68 5/8 | 38 1/8 | 68 5/8 | 38 1/8 | 5 1/2 | 2 11/16 | 2 11/16 | 5/8 x 5/16 | 3 7/16 | 2 7/16 | 5/8 x 5/16 | 61 1/2 | 77 1/4 | 47 5/8 | 63 | 83 1/8 | 53 1/2 | 27 1/4 | 40 | 20 3/8 | 56 3/4 |
| 402 | 37 | 51 | 74 7/8 | 41 5/8 | 74 3/8 | 41 1/4 | 6 | 2 15/16 | 2 15/16 | 3/4 x 3/8 | 3 7/16 | 2 7/16 | 5/8 x 5/16 | 68 | 85 3/8 | 52 3/4 | 69 | 92 1/4 | 59 5/8 | 30 1/8 | 43 7/8 | 22 3/8 | 62 1/2 |
| 445 | 40 7/8 | 57 1/2 | 80 | 43 7/8 | 80 3/4 | 44 3/8 | 6 | 3 3/16 | 2 3/16 | 1/2 x 1/4 | 3 15/16 | 2 11/16 | 5/8 x 5/16 | 74 1/2 | 93 3/8 | 57 1/4 | 76 7/8 | 100 3/4 | 64 5/8 | 33 1/2 | 48 15/16 | 23 5/8 | 70 1/4 |
| 490 | 44 7/8 | 62 | 88 3/8 | 48 3/4 | 91 1/2 | 50 5/8 | 7 | 3 7/16 | 2 7/16 | 5/8 x 5/16 | 3 15/16 | 3 7/16 | 7/8 x 7/16 | 81 3/4 | 102 7/8 | 63 1/8 | 82 7/8 | 110 3/8 | 70 5/8 | 36 7/8 | 53 5/8 | 25 7/8 | 77 |
| 542 | 49 3/4 | 68 | 96 1/2 | 52 3/4 | 98 1/2 | 54 1/8 | 7 | 3 15/16 | 2 11/16 | 5/8 x 5/16 | 4 7/16 | 3 7/16 | 7/8 x 7/16 | 90 1/2 | 113 1/4 | 69 1/4 | 91 3/4 | 121 | 77 | 40 3/8 | 59 1/4 | 28 7/8 | 84 |
| 600 | 55 | 74 | 105 5/8 | 57 7/8 | 107 5/8 | 59 1/4 | 8 | 3 15/16 | 2 11/16 | 5/8 x 5/16 | 4 15/16 | 3 7/16 | 7/8 x 7/16 | 99 1/2 | 125 | 76 3/8 | 100 | 133 1/8 | 84 1/2 | 44 1/2 | 65 1/4 | 31 7/8 | 92 1/8 |
| 660 | 60 1/2 | 80 | 115 1/8 | 62 3/4 | 116 3/4 | 63 3/4 | 8 | 4 7/16 | 2 15/16 | 3/4 x 3/8 | 4 15/16 | 3 7/16 | 7/8 x 7/16 | 109 1/2 | 137 3/8 | 84 | 110 | 146 1/8 | 92 3/4 | 49 3/4 | 72 3/8 | 33 1/8 | 104 1/4 |
| 730 | 67 | 88 | 127 1/2 | 69 5/8 | 127 1/2 | 69 5/8 | 9 | 4 15/16 | 3 7/16 | 7/8 x 7/16 | 5 15/16 | 3 15/16 | 1 x 1/2 | 121 1/8 | 154 1/2 | 95 3/8 | 121 1/4 | 161 1/8 | 102 | 54 5/8 | 79 3/4 | 37 1/8 | 114 |
| 807 | 73 3/4 | 95 1/2 | 138 1/4 | 75 | 139 7/8 | 75 5/8 | 9 | 5 15/16 | 3 15/16 | 1 x 1/2 | 6 7/16 | 4 7/16 | 1 x 1/2 | 133 5/8 | 170 5/8 | 105 3/8 | 133 1/4 | 176 7/8 | 111 5/8 | 60 | 87 15/16 | 40 7/8 | 124 11/16 |
| 890 | 81 5/8 | 106 1/2 | 153 | 82 1/2 | 153 | 82 1/2 | 9 | 6 7/16 | 4 7/16 | 1 x 1/2 | *6 11/16 | 4 7/16 | 1 x 1/2 | 148 | 188 3/8 | 116 1/2 | 147 1/8 | 198 7/8 | 126 7/8 | 65 13/16 | 96 3/4 | 46 3/8 | 136 3/8 |

Tolerance ± 1/8

Not to be used for construction. Certified drawings available upon request.

VCR Dimensional Data

BI & AF – Arrangement 1, SWSI, Class III



Notes

1. CW rotation shown; CCW rotation similar but opposite.
2. AF available in sizes 182 through 890.
3. BI available in sizes 182 through 890.
4. Discharge angles standard on all sizes. (Hole punching optional on all sizes.)
5. On specific sales orders, see Fan Data Schedule for performance and accessory information.

VCR Dimensional Data

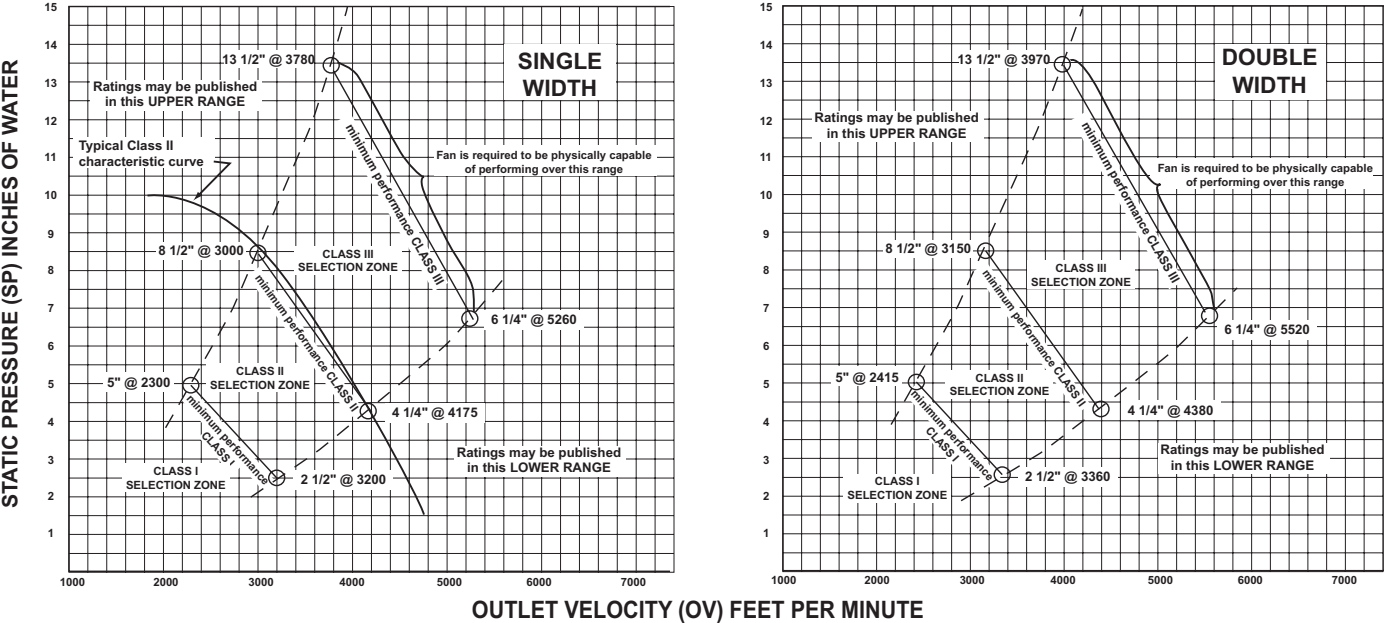
BI & AF – Arrangement 1, SWSI Class III / Cont.

| Size | A | B | C | "D" Centerline of Fan | | | | | | | E | F | G | H | J | K | L | M | N | P | Q | R | S |
|------|----------|---------|---------|-----------------------|--------|--------|--------|--------|--------|--------|-----------|-------|-----------|--------|---------|-----------|----------|-------|-----------|--------|-----------|-----------|-----------|
| | | | | THD | UBD | BHD | DBD | TAUD | BAUD | TADD | | | | | | | | | | | | | |
| 122 | 9 13/16 | 13 1/8 | 13 1/4 | 10 1/4 | 11 1/2 | 15 | 10 1/4 | 11 | 12 1/4 | 15 1/4 | 23 1/4 | 1 1/4 | 21 | 10 3/8 | 21 7/8 | 22 3/8 | 13 | 2 | 24 7/8 | 10 1/4 | 24 3/8 | 20 7/8 | 28 1/2 |
| 135 | 10 7/8 | 14 7/16 | 14 9/16 | 11 1/4 | 12 3/4 | 16 1/4 | 11 1/4 | 12 | 13 1/4 | 16 | 25 9/16 | 1 1/4 | 23 1/16 | 11 3/8 | 24 1/8 | 24 5/8 | 14 5/16 | 2 | 26 13/16 | 11 1/4 | 26 9/16 | 22 15/16 | 31 1/8 |
| 150 | 12 | 16 | 16 3/16 | 12 1/4 | 14 | 18 | 12 1/2 | 13 1/4 | 14 3/4 | 16 3/4 | 28 1/8 | 1 1/4 | 25 5/8 | 12 5/8 | 26 5/8 | 27 3/8 | 15 7/8 | 2 | 29 1/4 | 12 1/2 | 29 1/2 | 25 1/2 | 34 5/16 |
| 165 | 13 1/4 | 17 1/2 | 17 3/4 | 13 1/2 | 15 1/4 | 19 1/2 | 13 3/4 | 14 1/2 | 16 1/4 | 17 1/2 | 30 7/8 | 1 1/2 | 28 3/16 | 13 7/8 | 29 1/8 | 30 | 17 3/8 | 2 | 31 1/2 | 13 3/4 | 32 1/8 | 28 1/16 | 37 11/16 |
| 182 | 14 7/16 | 19 1/2 | 19 1/2 | 14 3/4 | 16 3/4 | 22 | 14 1/2 | 15 3/4 | 17 3/4 | 18 1/2 | 34 1/8 | 1 1/2 | 30 3/8 | 14 5/8 | 31 3/8 | 33 1/4 | 19 3/8 | 2 | 34 7/8 | 14 1/2 | 35 7/8 | 30 1/4 | 41 1/16 |
| 200 | 16 1/16 | 21 1/2 | 21 3/8 | 16 1/4 | 18 1/4 | 24 | 16 | 17 1/4 | 19 1/4 | 19 1/2 | 37 9/16 | 1 1/2 | 33 3/8 | 16 | 34 1/4 | 36 5/8 | 21 5/16 | 2 | 37 13/16 | 16 | 39 5/16 | 33 3/8 | 45 7/16 |
| 222 | 17 9/16 | 23 7/8 | 23 3/4 | 18 | 20 1/2 | 26 1/2 | 18 | 19 1/4 | 22 | 21 | 41 11/16 | 2 | 37 5/16 | 18 | 38 1/2 | 40 11/16 | 23 11/16 | 2 1/2 | 42 5/16 | 18 | 43 1/2 | 37 5/16 | 50 3/8 |
| 245 | 19 11/16 | 26 3/16 | 26 1/16 | 20 | 22 1/2 | 28 3/4 | 19 1/2 | 21 1/4 | 24 | 22 | 46 | 2 | 40 11/16 | 19 1/2 | 42 | 44 11/16 | 26 | 2 1/2 | 45 3/4 | 19 1/2 | 47 7/16 | 40 11/16 | 55 |
| 270 | 21 3/4 | 28 7/8 | 28 1/2 | 22 | 24 3/4 | 31 1/2 | 21 1/2 | 23 1/2 | 26 1/4 | 23 1/2 | 50 11/16 | 2 | 44 13/16 | 21 1/2 | 46 1/4 | 49 1/4 | 28 11/16 | 2 1/2 | 49 11/16 | 21 1/2 | 52 1/16 | 44 13/16 | 60 11/16 |
| 300 | 23 13/16 | 32 | 31 5/8 | 24 1/2 | 27 1/2 | 34 3/4 | 24 | 26 | 29 1/2 | 26 | 56 5/16 | 2 | 49 15/16 | 24 | 51 1/2 | 54 11/16 | 31 13/16 | 3 | 55 13/16 | 24 | 57 5/8 | 49 15/16 | 67 5/16 |
| 330 | 26 3/8 | 35 1/8 | 34 3/4 | 27 | 30 | 37 3/4 | 26 1/2 | 28 1/2 | 32 1/4 | 27 3/4 | 61 15/16 | 2 | 55 | 26 1/2 | 56 1/2 | 60 1/16 | 34 15/16 | 3 | 60 7/16 | 26 1/2 | 62 7/8 | 55 | 73 13/16 |
| 365 | 29 | 38 7/8 | 38 1/2 | 29 1/2 | 33 1/2 | 41 1/2 | 29 | 31 1/2 | 35 1/2 | 29 1/4 | 68 3/16 | 2 | 60 9/16 | 29 | 62 1/2 | 66 1/2 | 38 11/16 | 3 | 65 11/16 | 29 | 69 5/16 | 60 9/16 | 81 1/16 |
| 402 | 32 3/16 | 42 3/4 | 42 7/16 | 33 | 37 | 45 1/2 | 32 | 35 1/4 | 39 1/2 | 31 3/4 | 75 9/16 | 2 | 66 13/16 | 32 | 69 | 73 1/4 | 42 9/16 | 4 | 72 13/16 | 32 | 76 3/16 | 66 13/16 | 89 5/8 |
| 445 | 35 3/8 | 47 3/8 | 46 7/8 | 35 1/2 | 40 | 50 | 33 3/4 | 38 1/2 | 43 1/4 | 36 1/4 | 82 11/16 | 2 | 72 3/16 | 33 3/4 | 73 3/4 | 81 1/16 | 47 3/16 | 4 | 79 7/16 | 33 3/4 | 83 7/8 | 72 3/16 | 97 5/8 |
| 490 | 39 1/8 | 52 | 51 5/8 | 39 | 44 | 54 3/4 | 37 1/2 | 42 1/4 | 47 1/2 | 38 3/4 | 90 13/16 | 2 | 79 3/4 | 37 1/2 | 81 1/2 | 89 1/16 | 51 13/16 | 4 | 86 9/16 | 37 1/2 | 92 | 79 3/4 | 107 7/16 |
| 542 | 42 7/8 | 57 5/8 | 57 1/8 | 43 1/2 | 49 | 60 3/4 | 40 1/2 | 46 1/2 | 52 1/4 | 42 1/4 | 101 15/16 | 2 1/2 | 87 3/8 | 40 1/2 | 89 1/2 | 98 3/4 | 57 7/16 | 5 | 96 7/16 | 40 1/2 | 102 1/16 | 87 3/8 | 118 1/16 |
| 600 | 47 1/2 | 63 5/8 | 63 1/8 | 48 | 54 | 66 3/4 | 44 1/2 | 51 1/4 | 57 1/2 | 45 | 111 1/2 | 2 1/2 | 96 1/4 | 44 1/2 | 98 1/2 | 109 1/16 | 63 7/16 | 5 | 105 7/16 | 44 1/2 | 112 3/8 | 96 1/4 | 129 11/16 |
| 660 | 52 5/8 | 70 | 69 3/8 | 52 1/2 | 59 | 73 3/4 | 49 | 55 3/4 | 63 | 49 1/2 | 123 5/16 | 3 | 105 13/16 | 49 | 108 | 119 13/16 | 69 13/16 | 6 | 116 5/16 | 49 | 123 3/4 | 105 13/16 | 142 3/4 |
| 730 | 58 | 77 3/4 | 76 3/4 | 57 | 64 1/2 | 81 1/4 | 57 3/4 | 61 3/4 | 69 1/2 | 54 1/4 | 135 3/16 | 3 | 120 11/16 | 57 3/4 | 122 1/4 | 132 5/8 | 77 3/16 | 6 | 127 11/16 | 57 3/4 | 136 11/16 | 120 11/16 | 159 5/8 |
| 807 | 63 15/16 | 85 9/16 | 84 7/8 | 63 | 72 | 89 1/2 | 63 3/4 | 67 1/2 | 76 1/2 | 59 1/2 | 149 3/8 | 3 | 133 3/8 | 63 3/4 | 135 3/4 | 146 11/16 | 85 3/8 | 6 | 139 5/8 | 63 3/4 | 150 13/16 | 133 3/8 | 175 9/16 |
| 890 | 70 1/8 | 94 3/8 | 93 3/8 | 69 1/4 | 78 1/4 | 98 1/4 | 70 1/2 | 73 3/4 | 85 | 65 1/2 | 164 7/16 | 3 | 174 3/16 | 70 1/2 | 148 3/4 | 161 3/4 | 94 3/16 | 6 | 153 15/16 | 70 1/2 | 165 13/16 | 147 3/16 | 192 1/2 |

| Size | T | U | V | W | X | Y | "Z" - BI | | "Z" - AF | | AA | AB | AC | AD | AE | AF | AG | AH | AJ | AL | AM |
|------|-----------|----------|---------|---------|----------|--------|----------|-------------|----------|-------------|-----------|-----------|----------|-----------|----------|-----------|----------|----------|--------|--------|---------|
| | | | | | | | SFT | KWY | SFT | KWY | | | | | | | | | | | |
| 122 | 20 | 11 1/4 | 19 3/4 | 26 3/4 | 18 13/16 | 3 | 1 11/16 | 3/8 x 3/16 | -- | -- | 21 | 27 1/2 | 17 1/2 | 26 1/2 | 32 3/4 | 22 3/4 | 6 1/16 | 14 1/8 | 6 1/2 | 10 1/2 | 24 3/8 |
| 135 | 22 | 12 3/8 | 21 | 28 1/4 | 19 13/16 | 3 | 1 11/16 | 3/8 x 3/16 | -- | -- | 22 7/8 | 30 1/8 | 19 1/8 | 28 3/8 | 35 7/16 | 24 7/16 | 6 9/16 | 15 7/16 | 7 1/8 | 11 | 25 7/8 |
| 150 | 24 7/16 | 13 3/4 | 22 3/4 | 31 3/8 | 22 3/8 | 3 1/2 | 1 11/16 | 3/8 x 3/16 | -- | -- | 25 7/16 | 33 5/16 | 21 1/16 | 30 1/2 | 38 5/8 | 26 3/8 | 7 1/8 | 17 | 8 | 12 1/2 | 28 1/2 |
| 165 | 26 7/8 | 15 1/8 | 24 1/4 | 33 1/8 | 23 1/2 | 3 1/2 | 1 11/16 | 3/8 x 3/16 | -- | -- | 28 | 36 5/8 | 23 3/16 | 32 5/8 | 41 3/4 | 28 5/16 | 7 3/4 | 18 1/2 | 8 3/4 | 13 | 30 1/4 |
| 182 | 29 11/16 | 16 3/4 | 27 | 36 3/8 | 26 1/8 | 4 1/2 | 1 11/16 | 3/8 x 3/16 | 1 11/16 | 3/8 x 3/16 | 30 11/16 | 40 1/8 | 25 5/16 | 35 1/4 | 45 1/2 | 30 11/16 | 8 3/8 | 20 1/2 | 9 5/8 | 14 | 32 1/2 |
| 200 | 32 11/16 | 18 7/16 | 29 | 39 | 27 15/16 | 4 1/2 | 1 11/16 | 3/8 x 3/16 | 1 11/16 | 3/8 x 3/16 | 33 1/2 | 44 1/16 | 28 3/16 | 37 15/16 | 49 1/2 | 33 3/16 | 9 3/16 | 22 7/16 | 10 5/8 | 15 | 35 1/8 |
| 222 | 36 5/16 | 20 1/2 | 32 1/4 | 43 1/2 | 31 3/16 | 5 | 1 15/16 | 1/2 x 1/4 | 1 15/16 | 1/2 x 1/4 | 37 13/16 | 49 1/4 | 31 1/8 | 41 1/2 | 55 1/16 | 36 15/16 | 10 3/16 | 25 1/16 | 11 1/2 | 17 | 39 5/8 |
| 245 | 40 | 22 9/16 | 34 1/2 | 48 | 34 5/8 | 6 | 2 3/16 | 1/2 x 1/4 | 2 3/16 | 1/2 x 1/4 | 41 7/16 | 53 11/16 | 33 3/4 | 44 9/16 | 59 3/8 | 39 7/16 | 11 1/4 | 27 3/8 | 12 5/8 | 18 1/2 | 43 1/4 |
| 270 | 44 | 24 13/16 | 37 | 52 | 37 5/8 | 6 | 2 3/16 | 1/2 x 1/4 | 2 3/16 | 1/2 x 1/4 | 45 7/16 | 59 1/8 | 37 3/16 | 48 5/16 | 64 9/16 | 42 5/8 | 12 1/4 | 30 1/16 | 13 7/8 | 20 1/2 | 47 1/4 |
| 300 | 48 15/16 | 27 9/16 | 42 | 58 1/8 | 42 3/16 | 7 | 2 7/16 | 5/8 x 5/16 | 2 7/16 | 5/8 x 5/16 | 50 7/8 | 65 3/4 | 41 5/16 | 53 9/16 | 72 | 47 9/16 | 13 9/16 | 33 7/16 | 15 5/8 | 22 1/2 | 52 3/8 |
| 330 | 53 3/4 | 30 5/16 | 45 | 62 5/8 | 45 7/16 | 7 | 2 11/16 | 5/8 x 5/16 | 2 11/16 | 5/8 x 5/16 | 55 11/16 | 72 1/8 | 45 5/16 | 58 1/16 | 78 3/8 | 51 9/16 | 14 13/16 | 36 5/16 | 17 1/8 | 24 1/2 | 56 7/8 |
| 365 | 59 5/8 | 33 5/8 | 48 | 66 3/4 | 48 1/4 | 7 | 2 11/16 | 5/8 x 5/16 | 2 11/16 | 5/8 x 5/16 | 61 1/2 | 79 5/16 | 49 9/16 | 62 7/8 | 85 5/16 | 55 9/16 | 16 1/8 | 40 5/16 | 18 5/8 | 26 | 61 |
| 402 | 65 11/16 | 37 1/16 | 52 1/2 | 73 3/4 | 52 5/8 | 8 | 2 11/16 | 5/8 x 5/16 | 2 11/16 | 5/8 x 5/16 | 68 1/8 | 87 1/8 | 54 3/8 | 68 13/16 | 93 1/2 | 60 3/4 | 18 1/4 | 44 11/16 | 20 3/8 | 28 | 68 1/4 |
| 445 | 72 9/16 | 40 15/16 | 56 1/2 | 80 1/4 | 57 9/16 | 8 | 3 7/16 | 7/8 x 7/16 | 3 7/16 | 7/8 x 7/16 | 74 7/8 | 95 5/16 | 59 1/8 | 77 3/16 | 102 9/16 | 66 3/8 | 19 13/16 | 49 5/16 | 22 3/8 | 31 | 74 3/8 |
| 490 | 79 13/16 | 45 | 61 1/2 | 86 3/4 | 62 3/16 | 9 | 3 7/16 | 7/8 x 7/16 | 3 7/16 | 7/8 x 7/16 | 82 5/16 | 105 | 65 3/16 | 83 3/4 | 112 1/4 | 72 7/16 | 21 11/16 | 53 15/16 | 24 7/8 | 33 | 80 1/8 |
| 542 | 88 7/16 | 49 7/8 | 68 | 92 1/2 | 65 1/16 | 9 | 3 15/16 | 1 x 1/2 | 3 15/16 | 1 x 1/2 | 90 13/16 | 115 11/16 | 71 9/16 | 92 1/8 | 123 5/8 | 79 1/2 | 24 1/16 | 60 1/16 | 27 1/8 | 34 | 86 7/8 |
| 600 | 97 3/4 | 55 1/8 | 74 | 100 1/2 | 70 3/4 | 9 1/2 | 4 15/16 | 1 1/4 x 5/8 | 4 15/16 | 1 1/4 x 5/8 | 100 1/8 | 127 3/16 | 78 7/16 | 100 1/8 | 135 1/4 | 86 1/2 | 26 3/8 | 66 1/16 | 30 1/8 | 37 | 94 1/2 |
| 660 | 107 3/16 | 60 9/16 | 81 | 110 1/8 | 76 13/16 | 10 | 4 15/16 | 1 1/4 x 5/8 | 4 15/16 | 1 1/4 x 5/8 | 109 5/8 | 140 7/16 | 87 | 110 1/16 | 149 3/16 | 95 3/4 | 29 7/16 | 72 15/16 | 32 5/8 | 40 | 104 5/8 |
| 730 | 119 | 67 1/4 | 89 | 119 1/4 | 83 1/4 | 10 1/2 | 4 15/16 | 1 1/4 x 5/8 | 4 15/16 | 1 1/4 x 5/8 | 121 1/4 | 157 1/8 | 97 7/8 | 121 1/2 | 163 5/8 | 104 3/8 | 32 1/8 | 80 5/16 | 36 5/8 | 43 | 113 |
| 807 | 131 11/16 | 74 3/16 | 96 1/2 | 128 1/4 | 89 1/4 | 10 1/2 | 5 7/16 | 1 1/4 x 5/8 | 5 7/16 | 1 1/4 x 5/8 | 134 | 173 13/16 | 108 1/16 | 133 11/16 | 180 7/16 | 114 11/16 | 35 1/8 | 88 1/2 | 40 3/8 | 46 | 122 |
| 890 | 145 5/8 | 81 11/16 | 107 1/2 | 137 7/8 | 95 13/16 | 11 | 5 7/16 | 1 1/4 x 5/8 | 5 7/16 | 1 1/4 x 5/8 | 148 15/16 | 191 | 118 3/4 | 147 3/16 | 191 3/16 | 128 15/16 | 38 3/16 | 97 5/16 | 45 7/8 | 49 | 131 1/8 |

Tolerance ± 1/8 Not to be used for construction. Certified drawings available upon request.

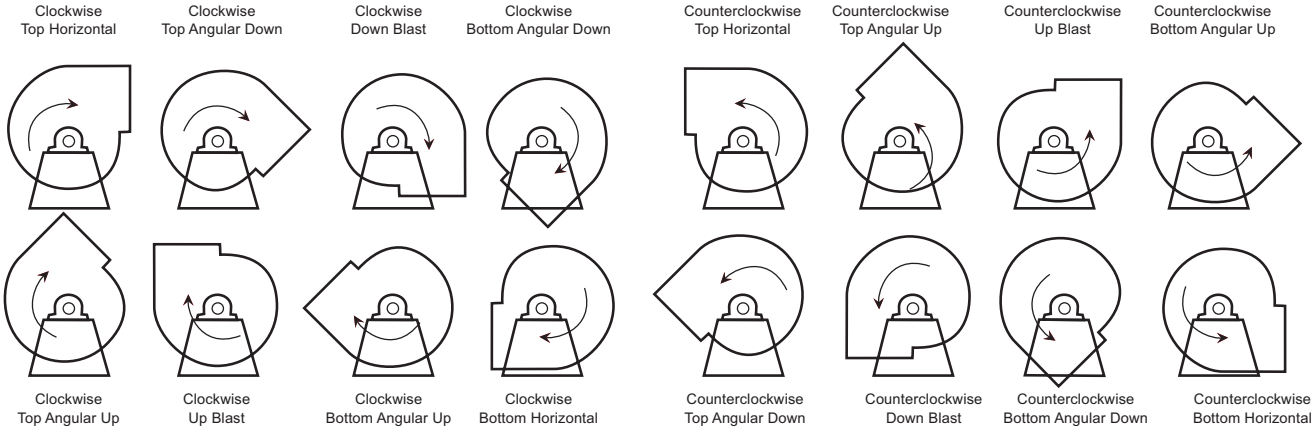
AMCA Fan Class Operating Limits



The diagram above is a reproduction of AMCA Standard 2408-69 which indicates the operating limits for Classes I, II and III centrifugal fans. Since fans are selected on the basis of outlet velocity and static pressure, class selection for a fan can easily be made by locating the fan's desired performance on the chart. All values are based on air handled at 70°F and 29.92" barometer.

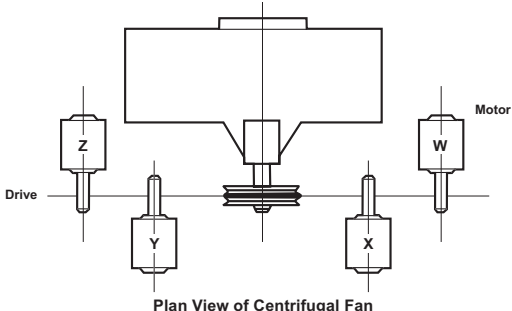
Rotation and Discharge

The direction of rotation is determined from the drive side of the fan. On single inlet fans, drive side is always opposite the fan inlet. On double inlet fans, drive side is the side with the extended shaft. The direction of discharge is determined in accordance with the diagrams below. The angle of discharge is referred to the horizontal axis of fan and designated in degrees above or below such standard reference axis.



Motor Positions

The diagram on the right indicates the standard terms for identifying motor position on the drive side of the fan. The location of the motor is determined by facing the drive side of the fan and designating the position by the letters, W, X, Y and Z. These positions are commonly used with Arrangements 1 and 3.

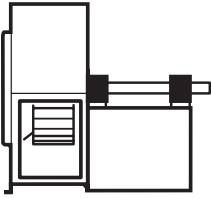


Reprinted from AMCA Publication 99-86, Standards Handbook, with the express written permission from the Air Movement and Control Association, Inc., 30 West University Drive, Arlington Heights, IL 60004-1983.

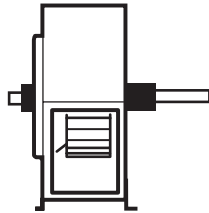
Engineering Notes

VCR Fan

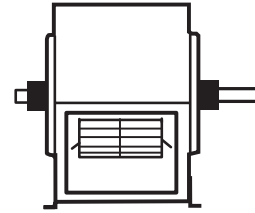
Drive Arrangements for Centrifigbual Fans



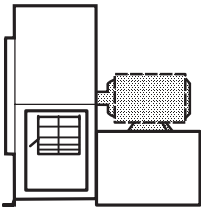
ARR. 1 SWSI For belt drive or direct connection. Impeller overhung. Two bearings on base.



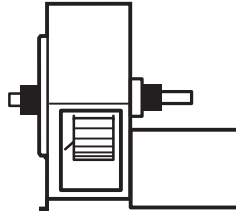
ARR. 3 SWSI For belt drive or direct connection. One bearing on each side and supported by fan housing.



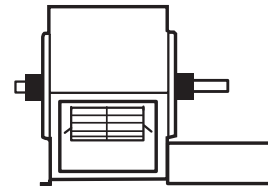
ARR. 3 DWDI For belt drive or direct connection. One bearing on each side and supported by fan housing.



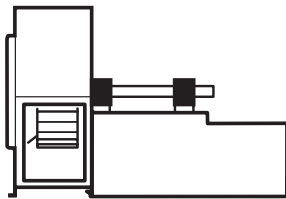
ARR. 4 SWSI For direct drive. Impeller overhung on prime mover shaft. No bearings on fan. Prime mover base mounted or integrally direct connected.



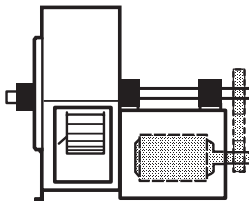
ARR. 7 SWSI For belt drive or direct connection. Arrangement 3 plus base for prime mover.



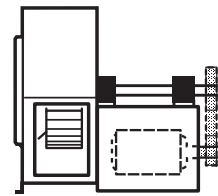
ARR. 7 DWDI For belt drive or direct connection. Arrangement 3 plus base for prime mover.



ARR. 8 SWSI For belt drive or direct connection. Arrangement 1 plus extended base for prime mover.

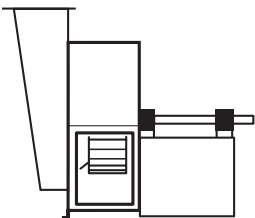


ARR. 9 SWSI For belt drive. Impeller overhung, two bearings, with prime mover outside base.

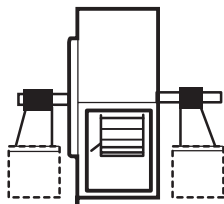


ARR. 10 SWSI For belt drive. Impeller overhung, two bearings, with prime mover inside base.

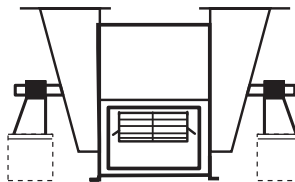
Inlet Boxes and Bearing Pedestals



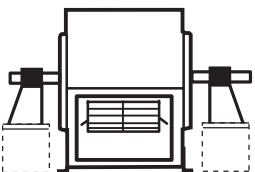
ARR. 1 SWSI with Inlet Box For belt drive or direct connection. Impeller overhung, two bearings on base. Inlet box may be self-supporting.



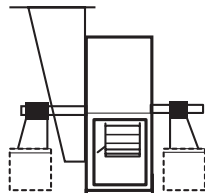
ARR. 3 SWSI with Independent Pedestals For belt drive or direct connection fan. Housing is self-supporting. One bearing on each side supported by independent pedestals.



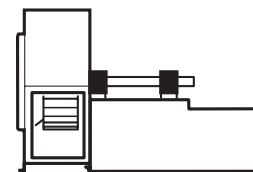
ARR. 3 DWDI with Inlet Box and Independent Pedestals For belt drive or direct connection fan. Housing is self supporting. One bearing on each side supported by independent pedestals with shaft



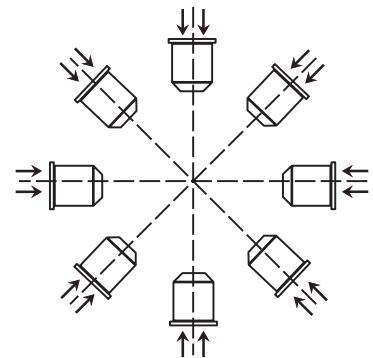
ARR. 3 DWDI with Independent Pedestals For belt drive or direct connection fan. Housing is self-supporting. One bearing on each side supported by independent pedestals.



ARR. 3 SWSI with Inlet Box and Independent Pedestals For belt drive or direct connection fan. Housing is self-supporting. One bearing on each side is supported by independent pedestals with shaft extending through inlet box.



ARR. 8 SWSI with Inlet Box For belt drive or direct connection. Impeller overhung, two bearings on base plus extended base for prime mover. Inlet box may be self-supporting.



1. Reference line is the top vertical axis through center of fan shaft.
2. Position of inlet box and air entry to inlet box is determined from DRIVE SIDE OF FAN.
3. Position of inlet box is designated in degrees clockwise from top vertical axis as shown, and may be any intermediate angle as required.
4. Positions 135° to 225° in same cases interfere with floor structure.

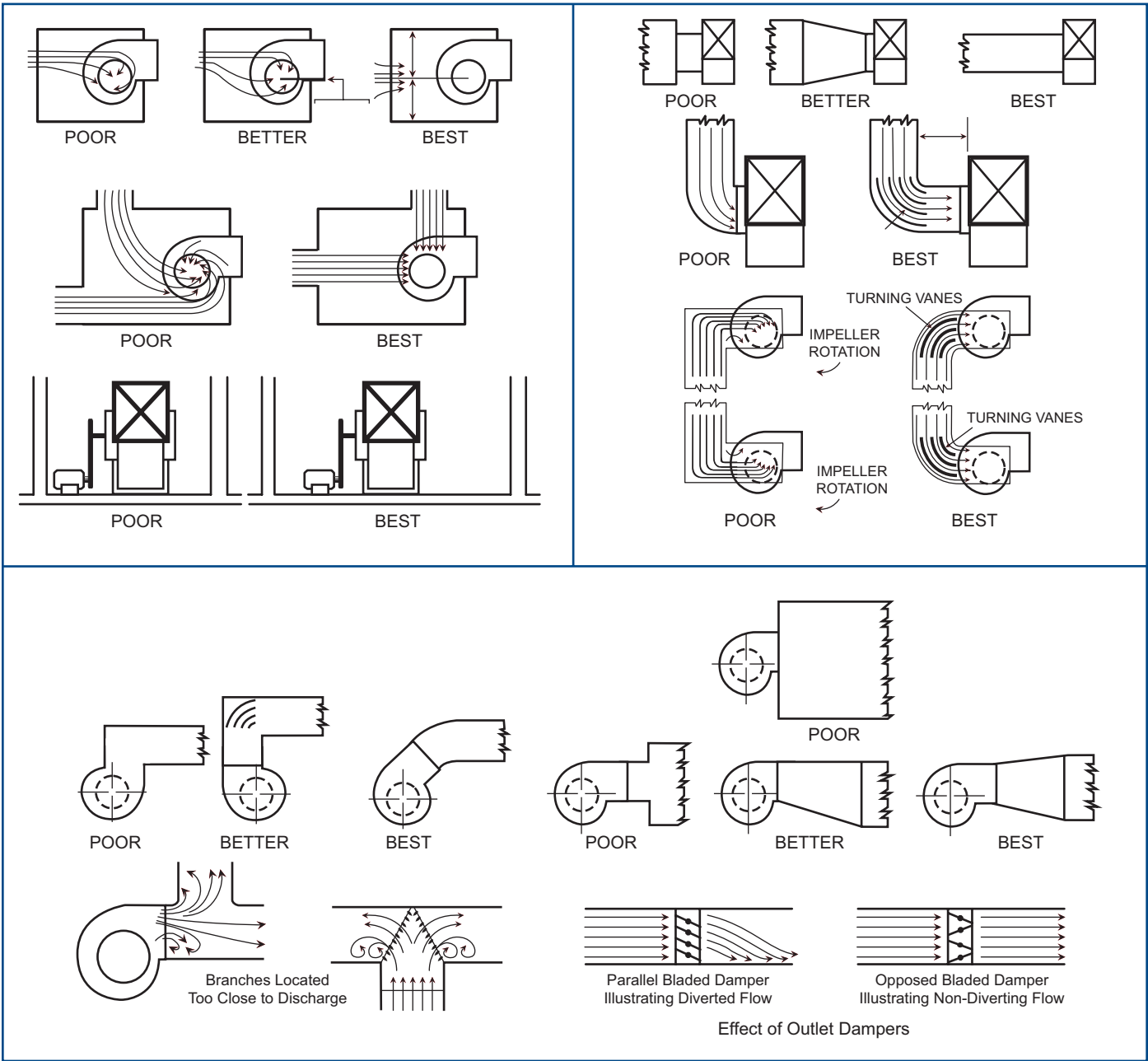
Special attention should be paid to **Fan Installation**. Improper installation will adversely affect fan and system performance resulting in increased energy usage. Improper installation will also increase noise levels. The ideal fan installation has long sections of straight duct attached to the fan inlet and discharge. However, ideal conditions are frequently not possible.

Duct elbows and branches located too close to the fan, and abrupt changes in duct size are some features that cause airstream turbulence. The impact of these features can be minimized by proper placement, use of turning vanes and use of smooth transition sections. Fan inlets should not be

obstructed; fans should be installed at least one inlet diameter from walls. In addition, pre-spin of inlet air should be avoided. Inlet pre-spin always reduces fan efficiency, no matter whether the pre-spin is with the fan rotation or against fan rotation.

The sketches below are intended to show correct and incorrect methods for handling the most common fan installations.

Several good references are available on the subjects of fan performance and fan installation. Some of these references are published by AMCA and ASHRAE. Another excellent source of information is your PennBarry representative.



Engineering Notes

VCR Fan

A fan operating at any given speed has the potential for delivering numerous different combinations of volumes and static pressures. Volume is normally expressed in cubic feet per minute (CFM); static pressure (SP) is normally expressed in inches of water gauge. Plotting all the potential combinations, or operating points, results in a smooth pressure-volume curve. See "Typical Performance Curve" on the next page. The specific point of operation for a fan running at a given RPM is determined by the system in which the fan is running. The relative position of that operating point on the curve can be expressed as a percent of free delivery.

Fan laws are a set of simple mathematical equations which are used to determine the effects of various changes on a fan operating under a given set of circumstances. For example, if the speed of a fan in a fixed system is increased, the following results will occur:

- Air volume will increase in a direct proportion to the increase in speed,
- Static pressure will increase as the square of the increase in speed, and
- Brake horsepower will increase as the cube of the increase in speed.

The following fan laws will cover most application questions. Equations can be combined if, for example, the effects of changing both air volume and air density must be calculated.

Effect of Varying Speed

Fan size and gas density remain constant.

$$CFM_c = CFM \times \left(\frac{RPM_c}{RPM} \right) \quad SP_c = SP \times \left(\frac{RPM_c}{RPM} \right)^2$$

$$TP_c = TP \times \left(\frac{RPM_c}{RPM} \right)^2 \quad VP_c = VP \times \left(\frac{RPM_c}{RPM} \right)^2$$

$$BHP_c = BHP \times \left(\frac{RPM_c}{RPM} \right)^3$$

Effect of Changing Density

Fan size and speed remain constant.

$$CFM_c = CFM \quad SP_c = SP \times d_c / d$$

$$TP_c = TP \times d_c / d \quad VP_c = VP \times d_c / d$$

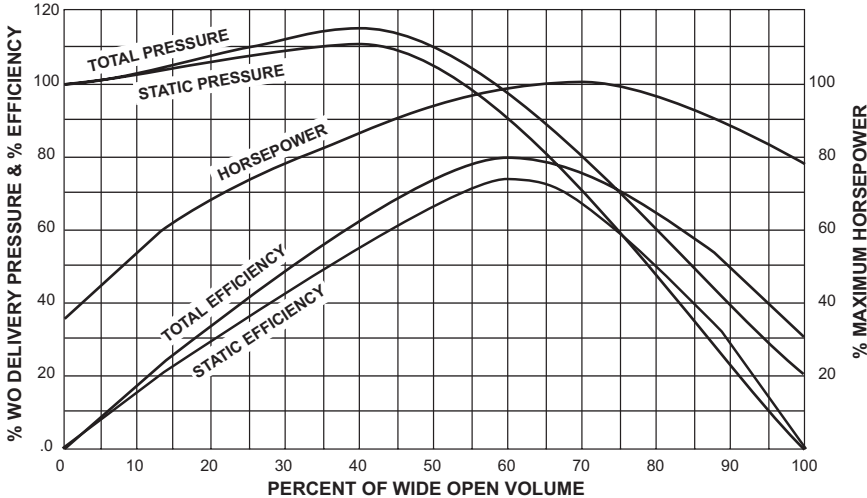
$$BHP_c = BHP \times d_c / d$$

Metric and Imperial Conversion Factors

| MEASUREMENT | IMPERIAL UNIT | METRIC UNIT | CONVERSION FACTOR* |
|--|----------------------------|---|---------------------------|
| Volume Flow Rate | cfm (ft ³ /min) | cubic meters per second (m ³ /sec) | 4.7195 x 10 ⁻⁴ |
| | cfm (ft ³ /min) | cubic meters per hour (m ³ /h) | 1.6990 |
| | cfm (ft ³ /min) | liters per second (l/s) | 4.7195 x 10 ⁻¹ |
| | cfs (ft ³ /sec) | cubic meters per second (m ³ /s) | 2.8316 x 10 ⁻² |
| Pressure | inches w.g. | pascal (pa or N/m ²) | 2.4909 x 10 ² |
| | inches w.g. | kilopascal (kPa) | 2.4909 x 10 ⁻¹ |
| | inches w.g. | millibar (mbar) | 2.4909 |
| | inches Hg. | kilopascal (kPa) | 3.3864 |
| Power | hp (bhp or ahp) | watt (W or J/s) | 7.4570 x 10 ² |
| | hp | kilowatt (kW) | 7.4570 x 10 ⁻¹ |
| Torque | lbf-in (lb-force-in) | newton meter (Nm) | 1.1298 x 10 ⁻¹ |
| | lbf-ft (lb-force-ft) | newton meter (Nm) | 1.3558 |
| Density | lb/ft ³ | kilogram per cubic meter (kg/m ³) | 1.6018 x 10 |
| Tip Speed Outlet Velocity or Duct Velocity | fpm (ft/min) | meters per second (m/s) | 5.0800 x 10 ⁻³ |
| | fps (ft/sec) | meters per second (m/s) | 3.0480 x 10 ⁻¹ |
| | mph (miles/hr) | meters per second (m/s) | 4.4704 x 10 ⁻¹ |
| Dimensions | inches | millimeters (mm) | 2.5400 x 10 |
| | feet | meter (m) | 3.0480 x 10 ⁻¹ |
| | thou (mil) = .001 in | micrometer (µm) | 2.5400 x 10 |
| Moment of Inertia | lb-ft ² | kilogram meter squared (kg m ²) | 4.2140 x 10 ⁻² |
| | slug-ft ² | kilogram meter squared (kg m ²) | 1.3558 |
| Energy (Work or Heat Equivalent) | hp hr (horsepower hour) | megajoule (MJ) | 2.6845 |
| | Btu (British thermal unit) | Kilojoule (kJ) | 1.0551 |
| | ft-lbf | joule (J) | 1.3558 |
| | kW hr | megajoule (MJ) | 3.6000 |
| Temperature | °F | kelvin | (°F + 459.67) ÷ 1.8 |
| | °F | celsius (°C) | (°F - 32) ÷ 1.8 |

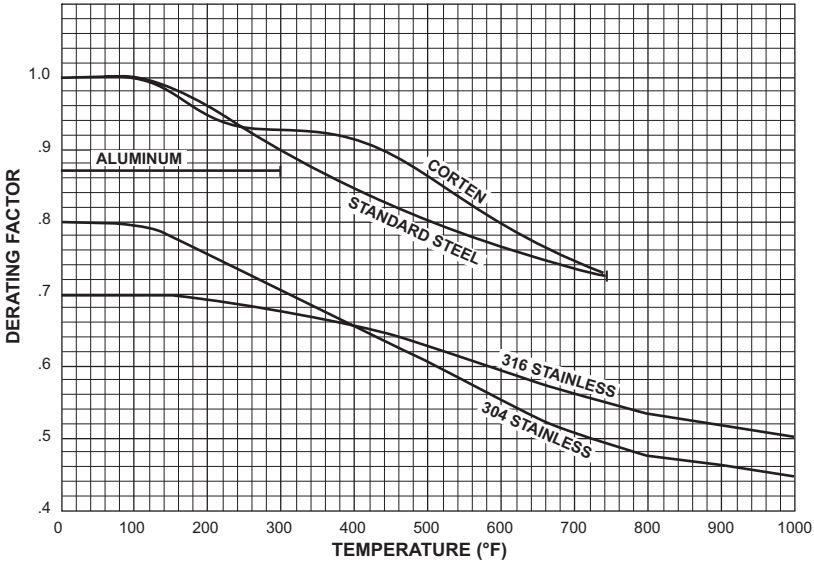
*Multiply imperial unit by this factor to obtain metric unit, except on temperature conversions.

Typical Performance Curve for Backward Inclined and Airfoil Fans

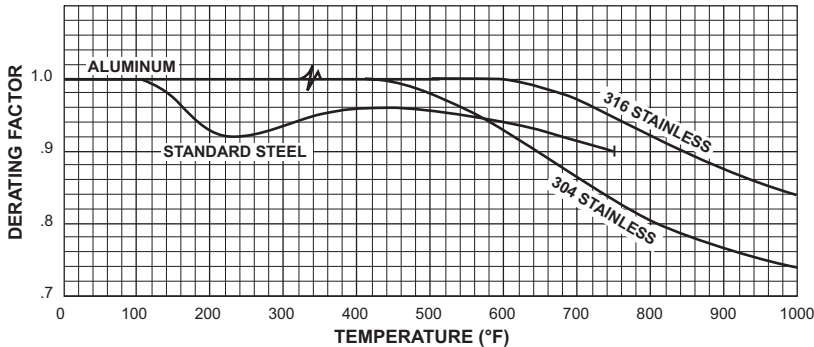


RPM Reduction Factors for High Temperature Operation

BACKWARD INCLINED WHEELS



AIRFOIL WHEELS



Engineering Notes

VCR Fan

Density Correction and Fan Selection

The performance tables which begin on page 20 enable you to determine precise speed and power requirements. Note that maximum efficiency points are in bold. For sound information refer to the backward inclined and airfoil "Sound Power Levels" section.

In accordance with AMCA standards, VCR performance tables are based on the standard air density of .075 lbs./cu. ft. This is the density of dry air at 70°F at 29.92" Hg barometric pressure (sea level).

To use the performance tables for densities other than .075:

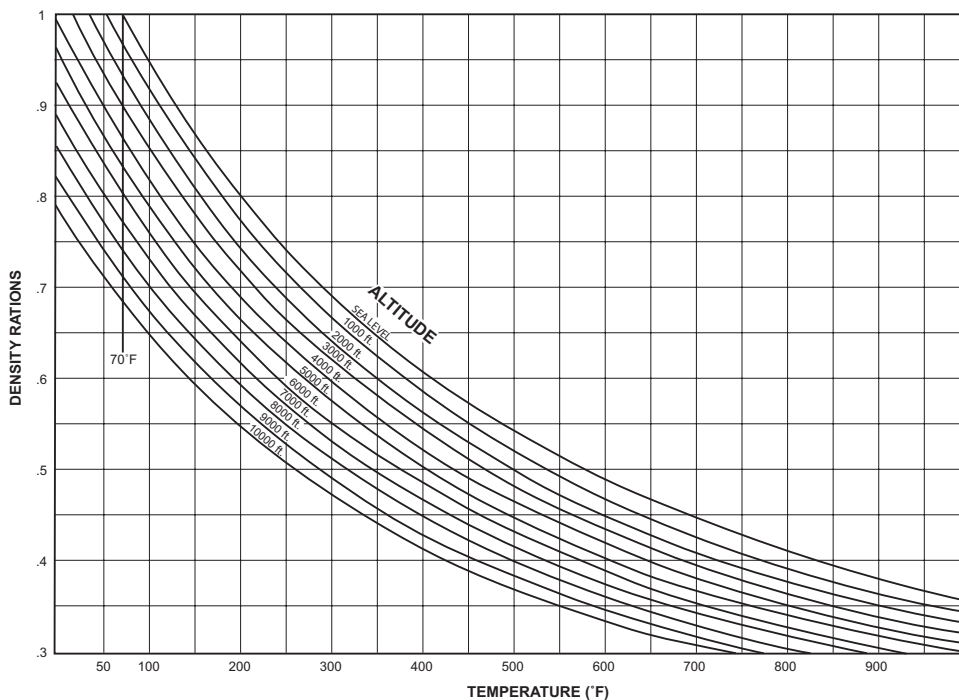
1. Determine the density ratio from the graph on this page using the actual temperature and altitude.
2. Divide the actual static pressure by the density ratio to establish the standard (equivalent) static pressure.
3. Use the standard static pressure and actual CFM to determine the fan RPM and brake horsepower (BHP) from the appropriate performance table.
4. Multiply the BHP from the table by the density ratio to find the actual BHP. It should be noted that a high temperature fan is often started up moving cold air. In such cases, motor starting requirements should reflect the actual air density at start up conditions.

Fan Selection Example: A single width airfoil fan is specified for the following job requirements: 15,000 CFM; 2.75" SP; 350°F air temperature; 2,000 feet above sea level; maximum outlet velocity (OV) 2,000 feet per minute.

1. From the graph below, the air density ratio is determined to be 0.61.

2. Divide the 2.75" actual static pressure by the air density ratio. The resulting standard (equivalent) static pressure is 4.5".
3. A quick examination of SWSI airfoil tables reveals that five different size fans, 270 through 402, can handle 15,000 CFM at 4.5" SP. However, the 2,000 FPM maximum outlet velocity reduces the possible fan selections to sizes 365 and 402 only. Since the 365 is more efficient, has a lower first cost, and takes up less space than the 402, the 365 is obviously the best selection.
4. The performance table indicates that the 365 AF will run at 993 RPM at 13.21 BHP. However, the BHP shown is based on a density of .075 lbs./cu. ft. and should be adjusted to actual conditions. Multiplying 13.21 BHP by the density ratio 0.61 gives the actual BHP of 8.06. While the fan is running at the specified conditions, a 10 horsepower motor will be sufficient, but cold air startup may require the use of a larger motor.
5. To be sure the 365 AF Class I fan is suitable for this application, the maximum wheel RPM must be checked at the operating temperature. From page 10 the maximum RPM for steel wheel at standard temperatures is found to be 1124. By using the bottom table on page 111, the de-rating factor for steel at 350°F is .955. Therefore, the maximum RPM at 350°F is $1124 \times .955 = 1073$, well above the 993 RPM required in this example.
6. The maximum allowable operating temperature for a single width VCR fan with standard construction is 300°F. Therefore, in this example situation, a 500°F heat fan package (see page 8) must be ordered on the fan selected.

Air Density Ratios at various altitudes and air temperatures



Furnish and install as shown on the plans the VCR airfoil and backward inclined fans as manufactured by PennBarry of Richardson, TX 75081. Unless otherwise noted, all fans shall conform to the layout shown on the drawings. Motor horsepowers and outlet velocities shall not be exceeded.

Fans shall be constructed of low carbon steel and painted with an approved corrosion resistant coating. Each fan shall receive a documented inspection by a qualified inspector before leaving the factory. The inspection will include welding, dimensions, bearings and overall workmanship.

Wheels and Housings

The wheel diameters and discharge areas shall be in accordance with the standard sizes adopted by AMCA for non-overloading fans. Wheels shall be the efficient, non-overloading airfoil or backward inclined types only. Inlets shall be fully streamlined and housings shall be suitably braced to prevent vibration or pulsation. Housings shall be constructed of heavy-gauge steel and shall be continuously welded throughout. The standard coating shall be durable and heat resistant up to 500°F.

Shaft and Bearings

The first critical shaft speed of Class I or II fans shall be at least 125% of the fan's maximum operating speed. The first critical speed of Class III and IV fans shall be at least 142% of the fan's maximum operating speed. Bearings shall be designed for heavy-duty service with a minimum L_{10} life of 20,000, 40,000 or 80,000 hours. Bearings ratings are based on the fan's maximum cataloged operating speed. Bearings shall be either single row or double row spherical roller type in a one-piece cast iron housing, or a double row spherical roller type in a split cast iron pillowblock. Bearings shall be rigidly supported on heavy structural supports.

Accessories

Accessories shall be provided as called for in the plans and specifications. Required accessories include special bearings, spark resistant construction, access door, drain, variable inlet vanes with stainless steel rods, discharge shutter, discharge screen, shaft seal, inlet flange, discharge flange, companion flanges, belt guard, weather cover, and split housing.

Performance

Fan performance shall be based on tests conducted in accordance with AMCA Standard Test Code for Air Moving Devices. All fans shall have a sharply rising pressure characteristic extending through the operating range and continuing to rise well beyond the efficiency peak to assure quiet and stable operation under all conditions. Horsepower characteristics shall be truly non-overloading and shall reach a peak in the normal selection area. Fan manufacturer shall provide sound power ratings in the eight octave bands which shall be based on AMCA Standard 300-05, test setup number 1. Sound power ratings shall be in decibels referenced 10^{-12} watts.

Balancing

A factory dynamic balance shall be made on all fans after their assembly. An IRD or PMC analyzer shall be used to measure velocity, and the final reading shall not exceed 0.1 inches per second.

Submittals

Submittals for approval of equipment shall include _____ copies of outline drawings, sound power ratings, and pressure-volume performance curves showing point of operation.

One Year Limited Warranty

Centrifugal Fan – VCR

What Products Are Covered

PennBarry Commercial and Industrial Fans (each, a “PennBarry Product”)

One Year Limited Warranty For PennBarry Products

PennBarry warrants to the original commercial purchaser that the PennBarry Products will be free from defects in material and workmanship for a period of one (1) year from the date of shipment.

Exclusive Remedy

PennBarry will, at its option, repair or replace (without removal or installation) the affected components of any defective PennBarry Product; repair or replace (without removal or installation) the entire defective PennBarry Product; or refund the invoiced price of the PennBarry Product. In all cases, a reasonable time period must be allowed for warranty repairs to be completed.

What You Must Do

In order to make a claim under these warranties:

1. You must be the original commercial purchaser of the PennBarry Product.
2. You must promptly notify us within the warranty period of any defect and provide us with any substantiation that we may reasonably request.
3. The PennBarry Product must have been installed and maintained in accordance with good industry practice and any specific PennBarry recommendations.

Exclusions

These warranties do not cover defects caused by:

1. Improper design or operation of the system into which the PennBarry Product is incorporated.
2. Improper installation.
3. Accident, abuse or misuse.
4. Unreasonable use (including any use for non-commercial purposes, failure to provide reasonable and necessary maintenance as specified by PennBarry, misapplication and operation in excess of stated performance characteristics).
5. Components not manufactured by PennBarry.

Limitations

1. In all cases, PennBarry reserves the right to fully satisfy its obligations under the Limited Warranties by refunding the invoiced price of the defective PennBarry Product (or, if the PennBarry Product has been discontinued, of the most nearly comparable current product).
2. PennBarry reserves the right to furnish a substitute or replacement component or product in the event a PennBarry Product or any component of the product is discontinued or otherwise unavailable.
3. PennBarry’s only obligation with respect to components not manufactured by PennBarry shall be to pass through the warranty made by the manufacturer of the defective component.

General

The foregoing warranties are exclusive and in lieu of all other warranties except that of title, whether written, oral or implied, in fact or in law (including any warranty of merchantability or fitness for a particular purpose).

PennBarry hereby disclaims any liability for special, punitive, indirect, incidental or consequential damages, including without limitation lost profits or revenues, loss of use of equipment, cost of capital, cost of substitute products, facilities or services, downtime, shutdown or slowdown costs.

The remedies of the original commercial purchaser set forth herein are exclusive and the liability of PennBarry with respect to the PennBarry Products, whether in contract, tort, warranty, strict liability or other legal theory shall not exceed the invoiced price charged by PennBarry to its customer for the affected PennBarry Product at the time the claim is made.

Inquiries regarding these warranties should be sent to: PennBarry, 1401 North Plano Road, Richardson, TX 75081.

OTHER PENNBARRY PRODUCTS

CENTRIFUGAL PRODUCTS



Domex
Centrifugal
Roof Exhausters



Fumex Fatrap
Kitchen Hood Centrifugal
Roof Exhausters



Zephyr
Ceiling and Inline Fans



Dynamo
Centrifugal Blowers



Centrex Inliner
Centrifugal Inline Fans



LC Dynafan
Low Contour Centrifugal
Roof Exhausters

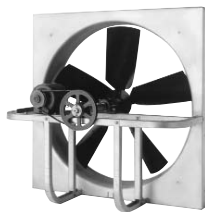


ESI
Efficient Silent
Inline Fan



Fume Exhaust
Curb Mounted
Centrifugal Fans

AXIAL / GRAVITY PRODUCTS



Breezeway
Propeller Wall Fans



HI-EX
Power Roof Ventilator



Tubeaxial
Inline Fans



Vaneaxial
Inline Fans



Powered Airette
Axial Roof Ventilators



Airette
Gravity Intake/Relief Hood



Domex Axial
Axial Roof Ventilators



Axcentrix
Bifurcator Fan

For more information contact your local PennBarry Sales
Manufacturer Representative or visit us at www.PennBarry.com

