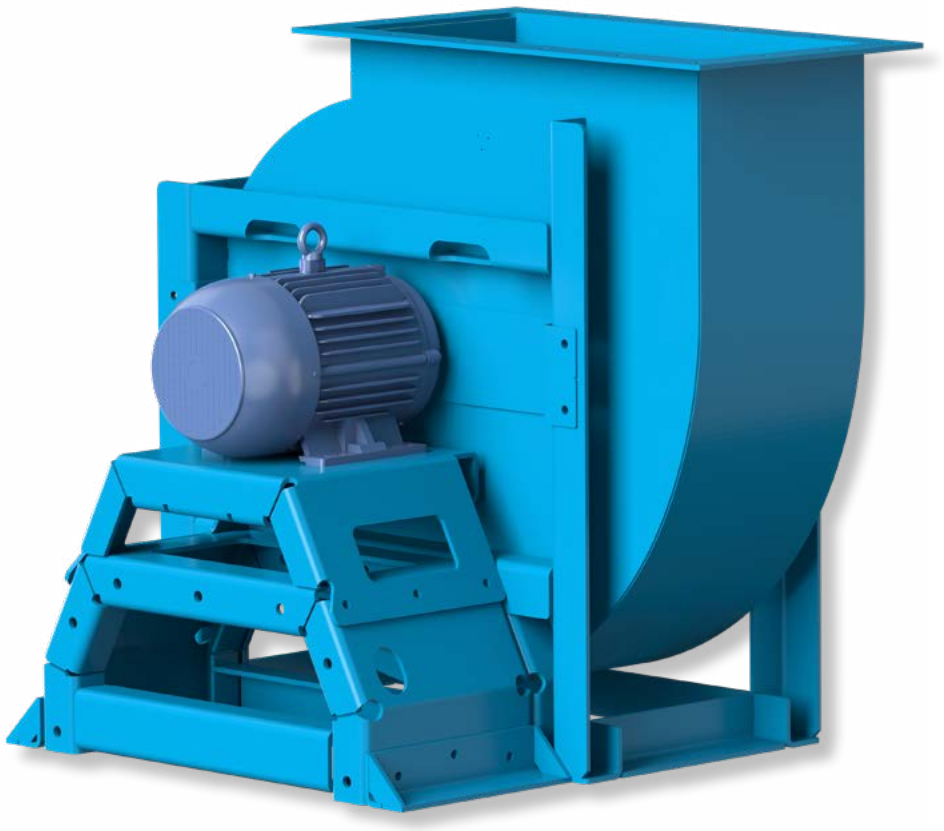
TCF

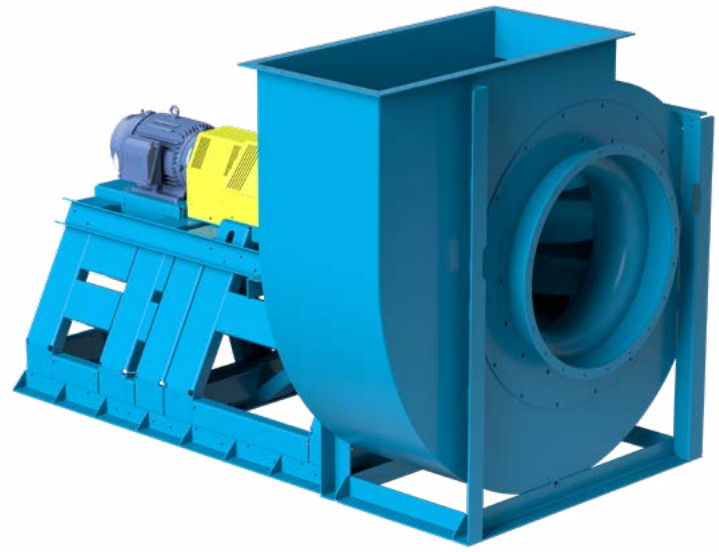
TWIN CITY FAN

INDUSTRIAL PROCESS AND
COMMERCIAL VENTILATION SYSTEMS

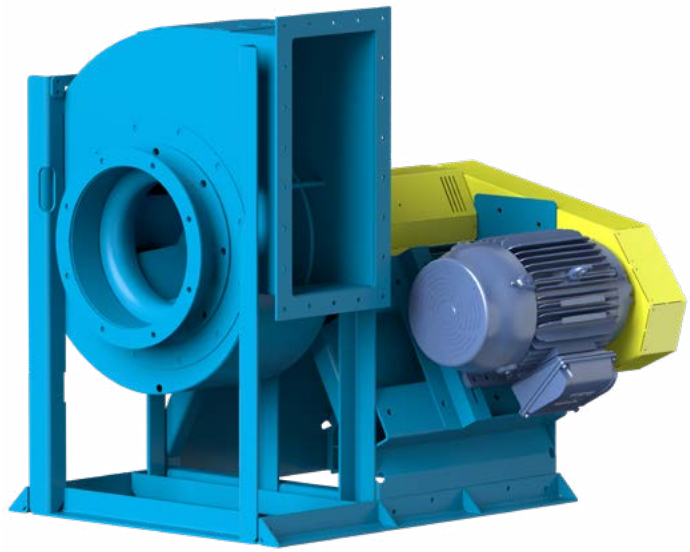
# HOUSED CENTRIFUGAL HIGH PRESSURE FANS

## MODEL HCF





Arrangement 8



Arrangement 9

# Overview

## HCF

The Model HCF fan from Twin City Fan & Blower is a high efficiency backward curved industrial fan designed for handling relatively clean air in high pressure applications. The single-thickness, dihedral backward curved blade on the impeller is designed to move air in a highly efficient manner. The airfoil blade is even more efficient than the backward curved blade and should target applications where power needs to be optimized and noise minimized. Typical industries include general HVAC (exhaust, filtration, return and supply, air of commercial buildings), automotive, air pollution, fertilizer, metal and mineral processing, pulp and paper, petrochemical, pharmaceutical, power, water and wastewater treatment.

The aerodynamically designed impeller and housing of the Model HCF fan produces a high volume of air at a lower velocity, eliminating the need for an expansion evasé.

Model HCF fans are available with a variety of construction options and accessories, offering the versatility and flexibility required in today's commercial and industrial applications.

### Typical Applications Include

Agricultural, Air Pollution Control (including filtration and dust collection), Chemical/Corrosive Process, Combustion Air Drying Process Exhaust, Forced Draft on Fluid Bed Boilers, General HVAC, General Manufacturing, High Temperature Applications, Induced Draft After Baghouse and Other Process, Moisture Blow-Off, Product Cooling, Water Treatment

### Impeller Types

Backward Curved and Airfoil

### Configurations

Available in direct and belt driven Arrangements 1, 4, 8, 9 and 10

### Optional Construction

High Temperature, Spark Resistant, X-Split Housings

### Certification

AMCA Sound/Air, FEI

Twin City Fan & Blower certifies that the Model HCF fans shown herein are licensed to bear the AMCA Seal. Certified performance data may be found in Twin City Fan & Blower's Fan Selector software.

Scan the QR code to search Twin City Fan & Blower's AMCA-certified products.

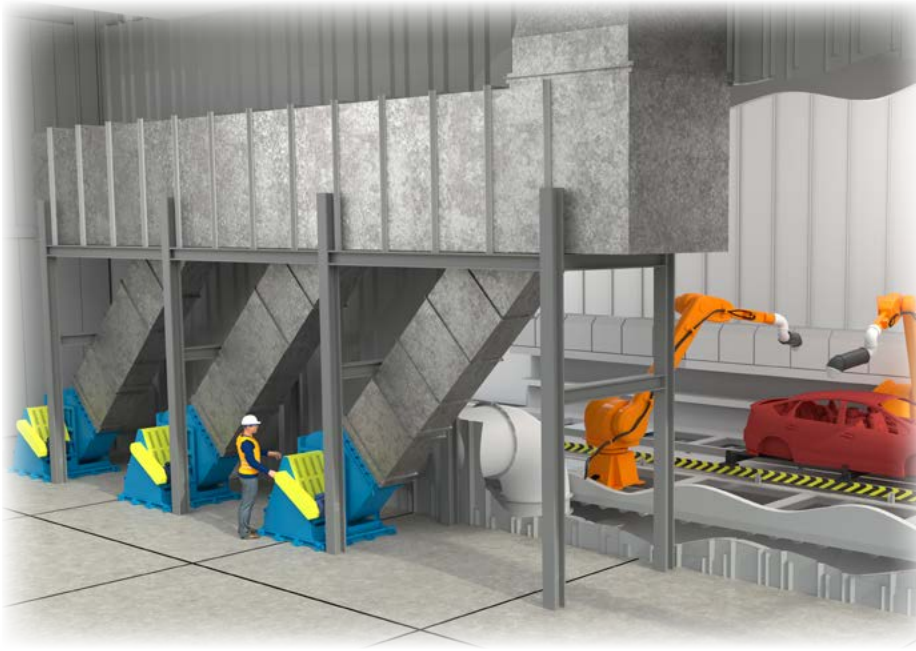
For complete product performance, drawings and available accessories, download our Fan Selector software at *tcf.com*.

# Overview

## HCF

**Sizes and Performance**
12" to 63" (305 mm to 1,600 mm)
impeller diameters
Airflow to 138,400 CFM (235,100 $m^3$/hour)
Static pressure to 20.6" w.g. (5,120 Pa)
Airstream temperatures to 800°F

**Construction**
Available with AMCA Class I through III
Construction



Paint Booth Application with Model HCF

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# Energy Regulations

Twin City Fan & Blower supports energy efficiency regulations enacted by the U.S. Department of Energy (DOE) and specific states. The selection and application of fan products is a significant part of these regulations. Engineers and specifiers must understand how to apply TCF products to their specific applications to meet applicable DOE and state regulatory requirements. Twin City Fan & Blower has made significant investments in product testing and development to provide efficient products. Developments in Twin City Fan & Blower's Fan Selector software are in place to aid your decision in product selection to assist with meeting the efficiency requirements as stipulated in the applicable regulations.

Dust Collection Application with Model HCF

### Housings

Heavy-gauge, reinforced, continuously-welded housings provide strength and durability for extended service life – a necessity in all commercial and industrial installations.

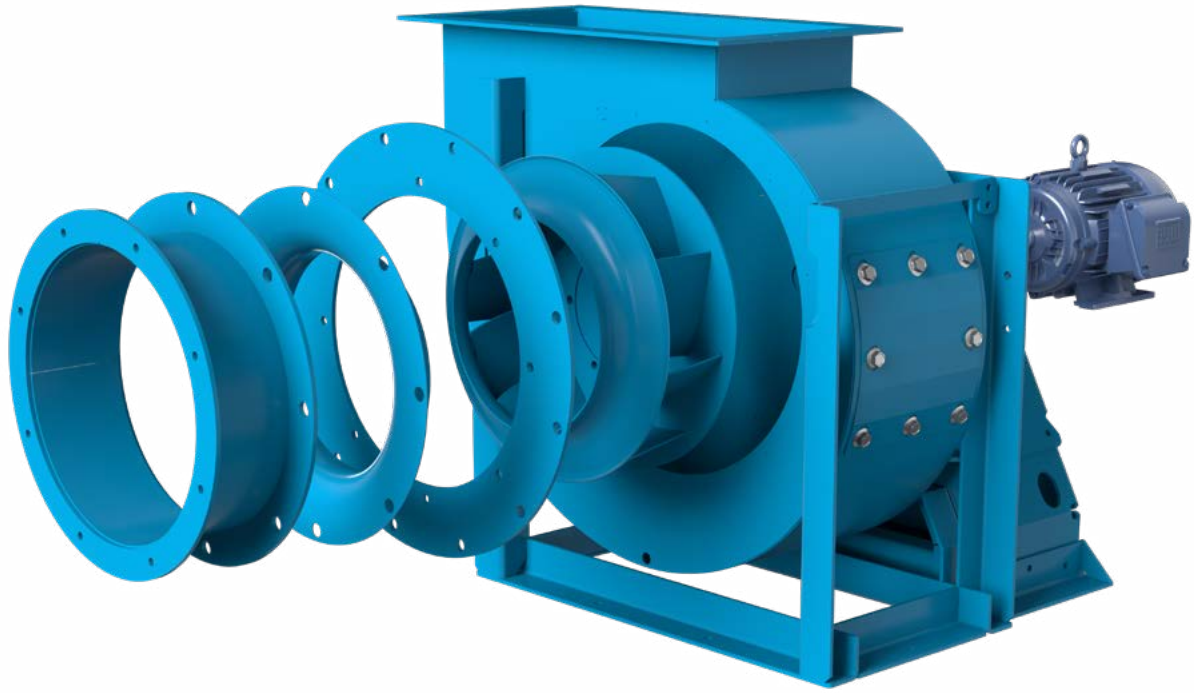
Inlet and outlet flanges are standard for duct connections. Housings are reinforced with rigid bracing to increase structural integrity. Lifting lugs are also standard on all fans. Precisely positioned cutoff plates and aerodynamically-engineered inlet cones provide high efficiency and smooth airflow through the fan.

### Shaft

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

### Bearings

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



## IMPELLER DESIGN

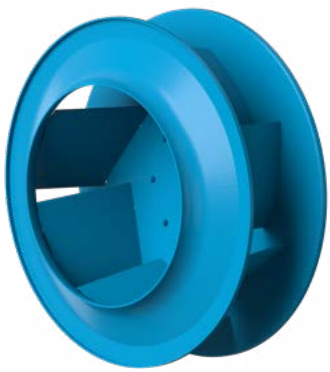
The HCF impellers features heavy-gauge steel or aluminum construction and a non-overloading impeller design, suitable for applications requiring large volumes of air at moderate to high pressures.

The high efficiency impeller features backward curved or airfoil blades of single thickness, welded to the rim and back plate. The backward curved impeller is available in both clockwise and counter-clockwise rotations, whereas the airfoil impeller is offered in a counter-clockwise rotation only.

A conical shroud (rim) makes Model HCF fans less susceptible to the performance losses associated with poor inlet conditions.

All HCF impellers are statically and dynamically balanced to grade G6.3 per ANSI S2.19 for smooth operation prior to assembly of the fan, followed by a final balance of the entire rotating assembly.

Backward Curved



Airfoil

## X-Split Housing

X-Split housing is a quartered-flanged housing that allows the removal of the impeller without disturbing the ductwork.

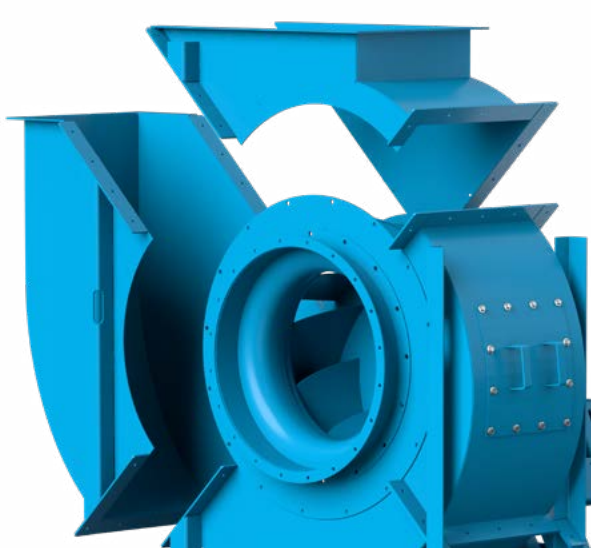
## Spark Resistant Construction

Fan applications may involve the handling of potentially explosive or flammable particles, fumes or vapors. Such applications require careful consideration by the system designer to insure the safe handling of such gases. Twin City Fan & Blower offers the following classifications of spark resistant construction per AMCA Standard 99. It is the specifier's or the user's responsibility to specify the type of spark resistant construction with full recognition of the potential hazards and the degree of protection required.

Type A: All parts of the fan in contact with the air or gas being handled shall be made of nonferrous material — usually aluminum and limited to 250°F.

Type B: The fan shall have a nonferrous impeller or impeller and nonferrous rub ring about the opening through which the shaft passes — typically aluminum impeller and rub ring and limited to 250°F.

Type C: The fan shall be constructed so that a shift of the impeller or impeller or shaft will not permit two ferrous parts of the fan to rub or strike.



X-Split Housings

## High Temperature Construction

Standard fan design options are available to handle airstream temperatures to 800°F. Consult your Twin City Fan & Blower sales representative for applications over 800°F or when aluminum (spark resistant) or stainless steel construction is required. The fan bearings should be kept outside of the hot airstream and below 130°F ambient. High temperature operating limits, available arrangements and necessary modifications are shown in Table 1

*Table 1. High Temperature Construction Requirements*

| TEMPERATURE (° F) | LUBRICATION | OTHER REQUIREMENTS | AVAILABLE ARRANGEMENTS |
|---|---|---|---|
| –22° to 300° | Grease | Standard Fan | 1, 4*, 8, 9, 10** |
| 301° to 500° | High Temp. Grease | Shaft Cooler, Shaft Seal, Expansion & Non-Expansion Bearings | 1, 8, 9 |
| 501° to 800° | High Temp. Grease | Same as 301° to 500° With Addition of High Temp. Paint | 1, 8 |
| 801° to 1000° | High Temp. Grease | Same as 501° to 800° With Addition of Stainless Airstream Components | 1, 8 |

* Arrangement 4 limited to 180°F
** Arrangement 10 limited to 250°F

# NOMENCLATURE

**HCF - 490 - BC - C**

**Model**

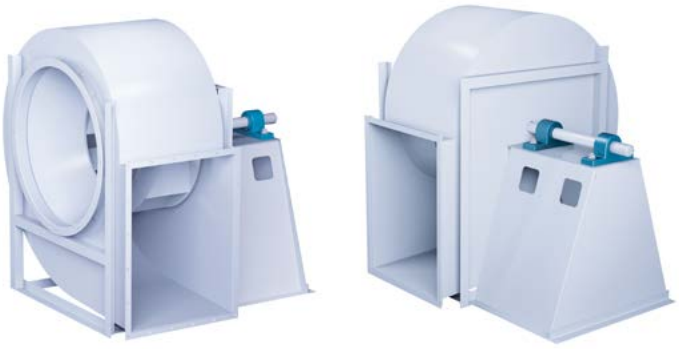
**Fan Size**

**Impeller Type**
BC = Backward Curved
BI = Backward Inclined
AF = Airfoil

**Construction Level**
A = Best
B = Better
C = Good

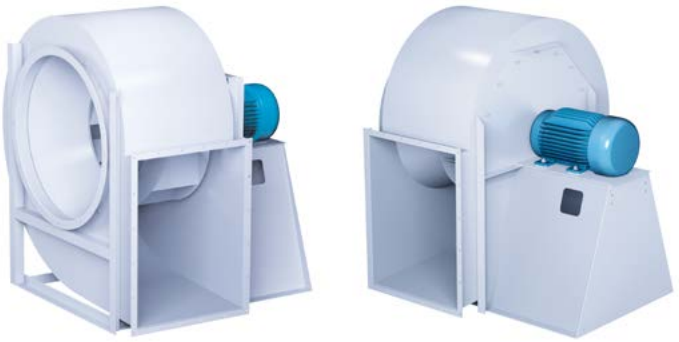
### Arrangement 1

Arrangement 1 is typically belt driven. The impeller is overhung on the shaft, i.e., mounted at the end of the shaft. The motor can be mounted in any of the four AMCA standard motor positions shown on page 10. The two fan bearings are mounted on the bearing pedestal, out of the airstream, which makes them ideal for high temperature or contaminated air applications. Belt driven configurations offer performance flexibility.



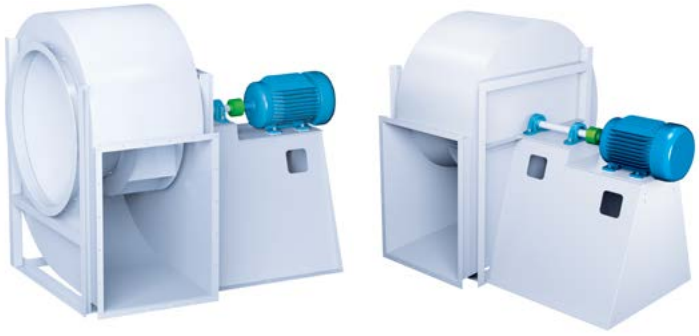
### Arrangement 4

Arrangement 4 is a direct drive fan. The impeller is mounted directly to the motor shaft with the motor mounted to a pedestal. Arrangement 4 offers low maintenance since there are no fan bearings, fan shaft or drive parts to maintain. Arrangement 4 fans are typically limited up to size 365.



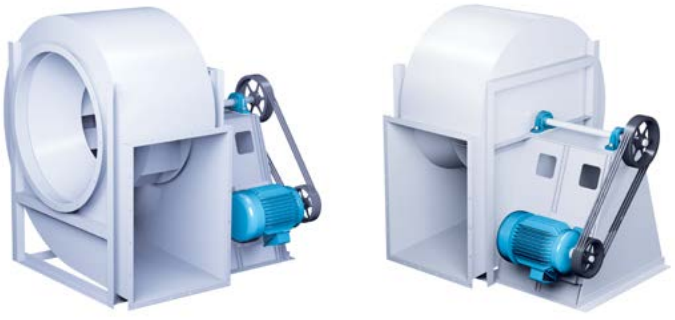
### Arrangement 8

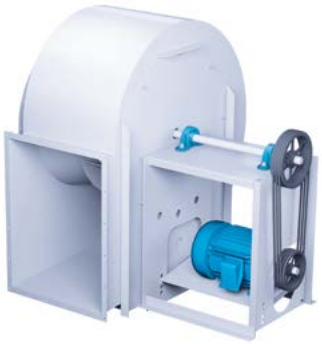
Arrangement 8 is a modified version of Arrangement 1 used for direct drive. The Arrangement 1 bearing pedestal is extended to accommodate the motor. A flexible coupling connects the fan and motor shaft.



### Arrangement 9

Arrangement 9 is available as belt driven only. A motor slide base is mounted on the side of the bearing pedestal. This arrangement permits the unit to ship as a complete assembly with the motor and drive mounted. Typically, the motor is mounted on the left side of the pedestal for CW rotation fans and on the right side for CCW rotation fans.





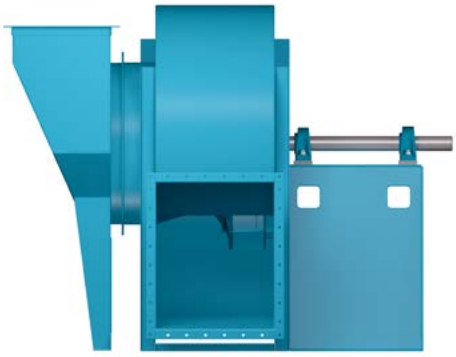
Sizes 122-365
(Vent Sets)

Sizes 402-600, Class I & II

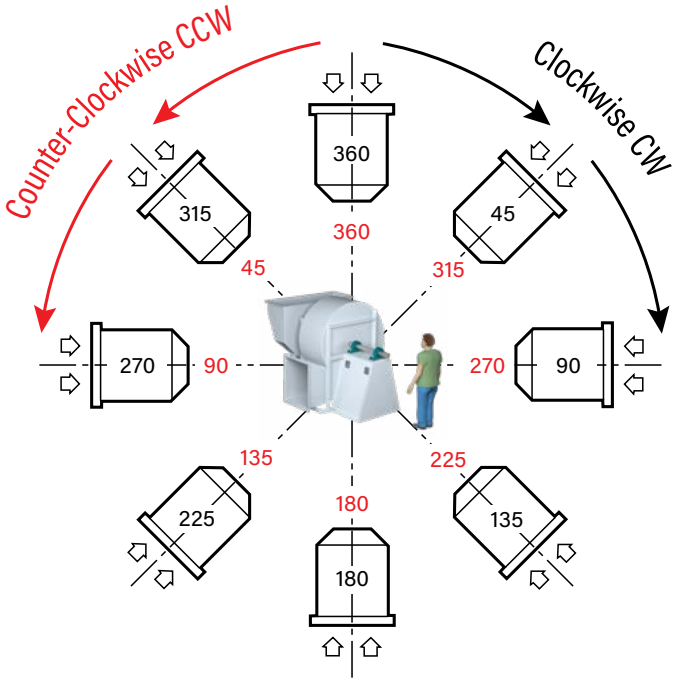
## Arrangement 10
## SWSI — Single Width, Single Inlet

Arrangement 10 is available as belt driven only. For Class I and II fans, sizes 122 through 365, Arrangement 10 units are commonly referred to as Ventilating Sets. (Refer to Catalog 600 for more details.) Arrangement 10 units have adjustable motor bases mounted inside the bearing pedestal. This arrangement offers a more compact design than the Arrangement 9 and is suitable for roof or outdoor installations when supplied with the optional weather cover.

# INLET BOXES



**DETACHED INLET BOX**
**(BOLT ON)**




Inlet box positions **determined from Drive Side**.

### Inlet Box Positions for Centrifugal Fans

| INLET BOX POSITIONS AND DESCRIPTIONS |
|---|
| 45 — Angular Down Intake |
| 90 — Horizontal Intake |
| 135 — Angular Up Intake |
| 180 — Bottom Up Intake |
| 225 — Angular Up Intake |
| 270 — Horizontal Intake |
| 315 — Angular Down Intake |
| 360 — Top Down Intake |

Reference line is the Top Vertical Axis through center of fan shaft.

Position of inlet box and air entry to inlet box is determined from drive side of fan.

Position of inlet box is designated in degrees clockwise from Top Vertical Axis as shown.

Positions 135° to 225° may interfere with floor structures in some caes.

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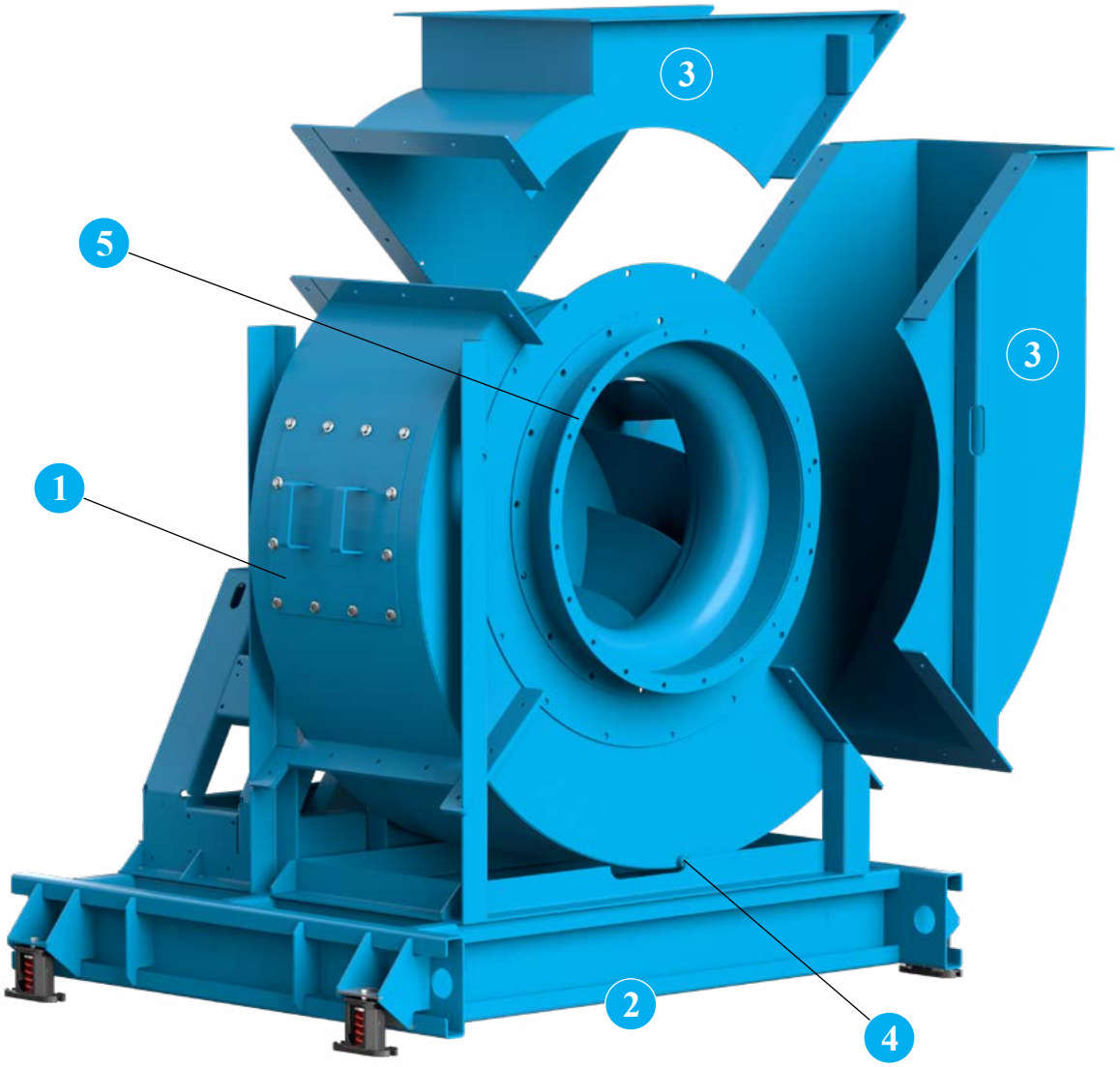
# OPTIONS/ACCESSORIES




1. **Bolted Access Door** for impeller inspection and maintenance.
2. **Isolation Base** See description on page 11.
3. **X-Split Housing** All sizes are designed to permit impeller removal through the fan inlet. X-split housing is optional on sizes 300-402 and required on sizes 445 and larger. This style of flanged housing allows the impeller and shaft to be removed for either maintenance or replacement without disconnecting ductwork.
4. **Drain w/ Plug** Threaded pipe coupling welded to the lowest point in the housing scroll. All fans come with a weep hole in the bottom of the housing as standard.
5. **Punched Flanged Inlet/Outlet** Punched inlet flanges are available for duct mounting. Punched outlet flanges are welded to the fan outlet.

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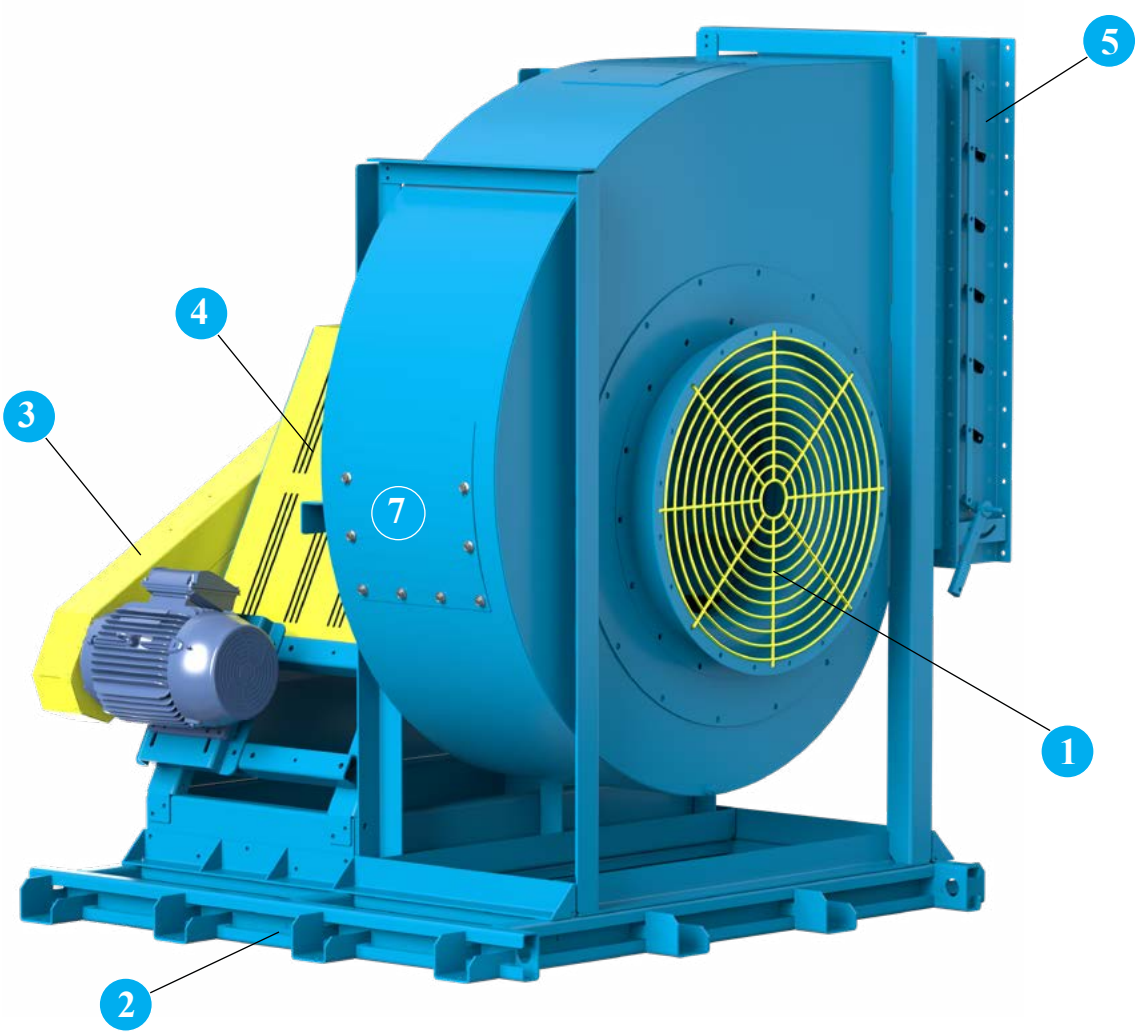
# OPTIONS/ACCESSORIES





Extended
Lube Lines

1. **Inlet Safety Screens** Available for mounting in the fan inlet or outlet in non-ducted applications.
2. **Unitary Base** See description on page 11.
3. **Belt Guard** Belt guard protects personnel from the moving drive parts. OSHA and quick access guards are available.
4. **Shaft & Bearing Guard** Sheet metal guard cover shaft and bearings. An exposed bearing shaft guard spanning the shaft between the bearings is available to provide open access to bearings for lubrication and vibration or temperature monitoring.
5. **Outlet Dampers** Double surface airfoil blades are available in either parallel or opposed blade design.
6. **Lube Lines** Allow for easy lubrication of bearings on belt driven units without disassembly by extending lubrication lines from fan bearings to exterior of pedestal.
7. **Quick Access Door** For quick impeller inspection and maintenance. Access doors are specified where examination and cleaning of the fan interior is required.

## Other Accessories Include:

- Piezometer Ring
- Bearing RTD (Temperature Sensors)
- Inlet Boxes
- Vibration Sensors
- Inertia Base
- Outlet Screen

## CLOCKWISE (CW) - ROTATION & DISCHARGE (ROTATION VIEW FROM DRIVE SIDE)

**UBD**
Upblast
CW 360

**TAU**
Top Angular Up
CW 45

**THD**
Top Horizontal
CW 90

**TAD**
Top Angular Down
CW 135

**DBD**
Downblast
CW 180

**BHD**
Bottom Horizontal
CW 270

**BAU**
Bottom Angular Up
CW 315

## COUNTER CLOCKWISE (CCW) - ROTATION & DISCHARGE (ROTATION VIEW FROM DRIVE SIDE)

**UBD**
Upblast
CCW 360

**TAU**
Top Angular Up
CCW 45

**THD**
Top Horizontal
CCW 90

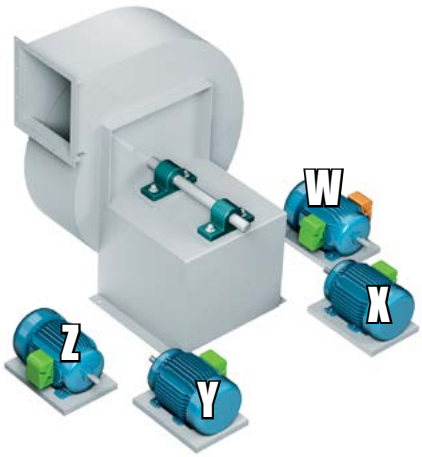
**TAD**
Top Angular Down
CCW 135

**DBD**
Downblast
CCW 180

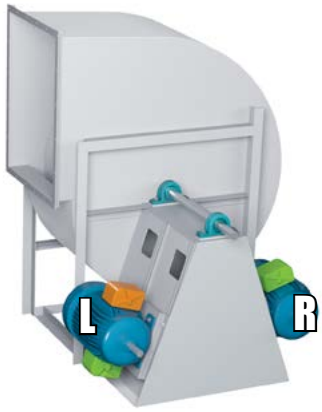
**BHD**
Bottom Horizontal
CCW 270

**BAU**
Bottom Angular Up
CCW 315

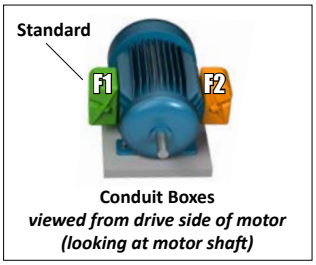
## MOTOR POSITIONS




**Arrangement 1**



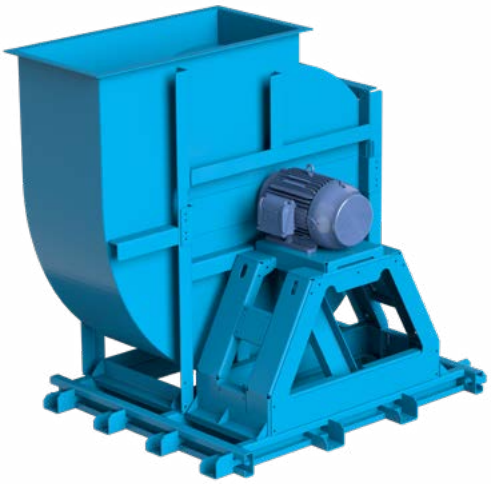

**Arrangement 9**




**Conduit Boxes**
***viewed from drive side of motor (looking at motor shaft)***

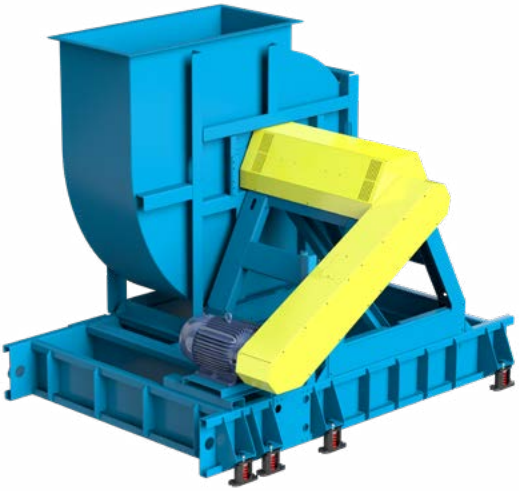
## Unitary Bases

The structural steel base provides common support to fan, motor and drive including guards. This style of base is designed for use without isolators and requires adequate foundation integrity for proper operation.



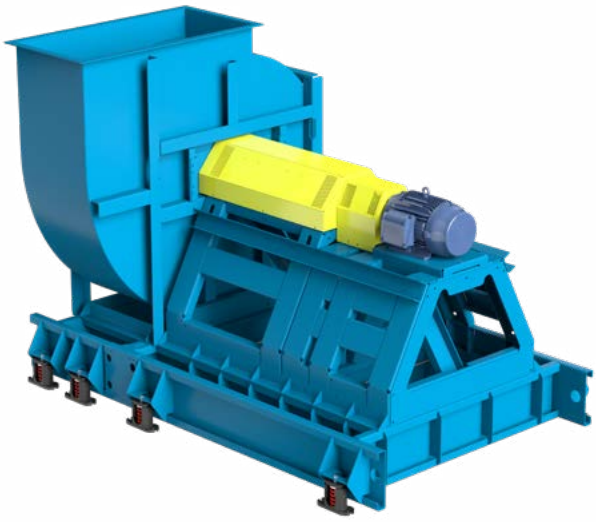
## Isolation Bases

Isolation bases provide a common support to fan, motor and drive, including guards. Constructed with heavy-duty structural channels and includes spring isolations. Not available on Arrangement 8. Flexible connectors at inlet and outlet are required.



## Inertia Bases

Inertia bases provide a common support to fan, motor and drive including guards and utilize heavy-duty structural channel with spring isolators. Inertia bases incorporate reinforcing rods and require customer supplied concrete. Inertia bases are typically used on longer, direct drive fans to mitigate assembly deflection, maintaining proper alignment between the motor, coupling, shaft and bearings. Flexible connectors at inlet and outlet are required.



## BC Impeller - Maximum RPM, Impeller Weights & WR²

| FAN SIZE | CLASS I | | | CLASS II | | | CLASS III | | |
|---|---|---|---|---|---|---|---|---|---|
| | MAX. RPM | WEIGHT (LB) | WR² (LB-FT²) | MAX. RPM | WEIGHT (LB) | WR² (LB-FT²) | MAX. RPM | WEIGHT (LB) | WR² (LB-FT²) |
| **165** | 2820 | 33 | 7 | 3670 | 33 | 7 | 4000 | 41 | 9 |
| **182** | 2507 | 43 | 12 | 3262 | 43 | 12 | 4000 | 53 | 16 |
| **200** | 2256 | 54 | 18 | 2936 | 54 | 18 | 3712 | 67 | 24 |
| **222** | 2014 | 70 | 30 | 2621 | 70 | 30 | 3314 | 86 | 39 |
| **245** | 1790 | 90 | 49 | 2330 | 90 | 49 | 2946 | 111 | 64 |
| **270** | 1540 | 118 | 82 | 2030 | 118 | 82 | 2560 | 143 | 105 |
| **300** | 1367 | 151 | 138 | 1802 | 151 | 138 | 2272 | 187 | 178 |
| **330** | 1286 | 172 | 179 | 1696 | 172 | 179 | 2138 | 214 | 232 |
| **365** | 1215 | 194 | 229 | 1601 | 194 | 229 | 2020 | 242 | 298 |
| **402** | 1070 | 241 | 362 | 1405 | 241 | 362 | 1770 | 306 | 475 |
| **445** | 955 | 341 | 617 | 1254 | 341 | 617 | 1500 | 418 | 785 |
| **490** | 856 | 478 | 1036 | 1124 | 478 | 1036 | 1335 | 566 | 1277 |
| **542** | 764 | 676 | 1769 | 1004 | 676 | 1769 | 1264 | 773 | 2110 |
| **600** | 713 | 835 | 2450 | 937 | 835 | 2450 | 1180 | 935 | 2865 |
| **660** | 669 | 1018 | 3322 | 878 | 1018 | 3322 | 1106 | 1117 | 3813 |

## Airfoil Impeller - Maximum RPM, Impeller Weights & WR²

| FAN SIZE | CLASS I | | | CLASS II | | | CLASS III | | |
|---|---|---|---|---|---|---|---|---|---|
| | MAX. RPM | WEIGHT (LB) | WR² (LB-FT²) | MAX. RPM | WEIGHT (LB) | WR² (LB-FT²) | MAX. RPM | WEIGHT (LB) | WR² (LB-FT²) |
| **122** | 3420 | 7 | 1 | 4000 | 7 | 1 | NA | NA | NA |
| **135** | 3035 | 9 | 1 | 3913 | 9 | 1 | NA | NA | NA |
| **150** | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **165** | 2650 | 15 | 3 | 3450 | 15 | 3 | 4000 | 15 | 3 |
| **182** | 2356 | 19 | 5 | 3067 | 19 | 5 | 3695 | 19 | 5 |
| **200** | 2120 | 25 | 7 | 2760 | 25 | 7 | 3350 | 25 | 7 |
| **222** | 1893 | 39 | 14 | 2464 | 39 | 14 | 2970 | 39 | 14 |
| **245** | 1683 | 46 | 23 | 2190 | 46 | 23 | 2640 | 46 | 23 |
| **270** | 1470 | 60 | 45 | 1920 | 60 | 45 | 2340 | 60 | 45 |
| **300** | 1305 | 95 | 78 | 1704 | 95 | 78 | 2080 | 95 | 78 |
| **330** | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **365** | 1160 | 126 | 140 | 1515 | 126 | 140 | 1850 | 126 | 140 |
| **402** | 1085 | 164 | 194 | 1400 | 164 | 194 | 1665 | 164 | 194 |

## BC Impeller - Bare Fan Weights (lb)

| FAN SIZE | CLASS I | | | | | CLASS II | | | | | CLASS III | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ARR. 1 | ARR. 4 | ARR. 8 | ARR. 9 | ARR. 10 | ARR. 1 | ARR. 4 | ARR. 8 | ARR. 9 | ARR. 10 | ARR. 1 | ARR. 4 | ARR. 8 | ARR. 9 | ARR. 10 |
| **165** | 362 | 360 | 560 | 414 | 671 | 362 | 360 | 560 | 414 | 671 | 362 | 360 | 560 | 414 | 671 |
| **182** | 443 | 448 | 654 | 821 | 832 | 443 | 448 | 654 | 821 | 832 | 443 | 448 | 654 | 821 | 832 |
| **200** | 539 | 515 | 758 | 881 | 887 | 539 | 515 | 758 | 881 | 887 | 539 | 515 | 758 | 881 | 887 |
| **222** | 721 | 662 | 1062 | 981 | 1023 | 721 | 662 | 1062 | 981 | 1023 | 721 | 662 | 1062 | 981 | 1023 |
| **245** | 873 | 778 | 1233 | 1122 | 1202 | 873 | 778 | 1233 | 1122 | 1202 | 873 | 778 | 1233 | 1122 | 1202 |
| **270** | 1020 | 929 | 1408 | 1424 | 1474 | 1020 | 929 | 1408 | 1424 | 1474 | 1020 | 929 | 1408 | 1424 | 1474 |
| **300** | 1326 | 1225 | 1799 | 1708 | 1719 | 1326 | 1225 | 1799 | 1708 | 1719 | 1326 | 1225 | 1799 | 1708 | 1719 |
| **330** | 1603 | 1398 | 2119 | 1864 | 1852 | 1603 | 1398 | 2119 | 1864 | 1852 | 1603 | 1398 | 2119 | 1864 | 1852 |
| **365** | 1715 | 1511 | 2239 | 2046 | 1955 | 1715 | 1511 | 2239 | 2046 | 1955 | 1715 | 1511 | 2239 | 2046 | 1955 |
| **402** | 1962 | 1746 | 2532 | 2379 | — | 1962 | 1746 | 2532 | 2379 | — | 1962 | 1746 | 2532 | 2379 | — |
| **445** | 2742 | 2513 | 3418 | 3181 | — | 2742 | 2513 | 3418 | 3181 | — | 2742 | 2513 | 3418 | 3181 | — |
| **490** | 3144 | — | 4016 | — | — | 3144 | — | 4016 | — | — | 3144 | — | 4016 | — | — |
| **542** | 4068 | — | 5034 | — | — | 4068 | — | 5034 | — | — | 4068 | — | 5034 | — | — |
| **600** | 4458 | — | 5504 | — | — | 4458 | — | 5504 | — | — | 4458 | — | 5504 | — | — |
| **660** | 4983 | — | 6131 | — | — | 4983 | — | 6131 | — | — | 4983 | — | 6131 | — | — |

## Airfoil Impeller - Bare Fan Weights (lb)

| FAN SIZE | CLASS I | | | | | CLASS II | | | | | CLASS III | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ARR. 1 | ARR. 4 | ARR. 8 | ARR. 9 | ARR. 10 | ARR. 1 | ARR. 4 | ARR. 8 | ARR. 9 | ARR. 10 | ARR. 1 | ARR. 4 | ARR. 8 | ARR. 9 | ARR. 10 |
| **122** | 271 | 260 | 437 | 250 | 451 | 271 | 260 | 437 | 250 | 451 | 271 | 260 | 437 | 250 | 451 |
| **135** | 323 | 314 | 540 | 307 | 502 | 323 | 314 | 540 | 307 | 502 | 323 | 314 | 540 | 307 | 502 |
| **150** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **165** | 362 | 360 | 560 | 414 | 671 | 362 | 360 | 560 | 414 | 671 | 362 | 360 | 560 | 414 | 671 |
| **182** | 443 | 448 | 654 | 821 | 832 | 443 | 448 | 654 | 821 | 832 | 443 | 448 | 654 | 821 | 832 |
| **200** | 539 | 515 | 758 | 881 | 887 | 539 | 515 | 758 | 881 | 887 | 539 | 515 | 758 | 881 | 887 |
| **222** | 721 | 662 | 1062 | 981 | 1023 | 721 | 662 | 1062 | 981 | 1023 | 721 | 662 | 1062 | 981 | 1023 |
| **245** | 873 | 778 | 1233 | 1122 | 1202 | 873 | 778 | 1233 | 1122 | 1202 | 873 | 778 | 1233 | 1122 | 1202 |
| **270** | 1020 | 929 | 1408 | 1424 | 1474 | 1020 | 929 | 1408 | 1424 | 1474 | 1020 | 929 | 1408 | 1424 | 1474 |
| **300** | 1326 | 1225 | 1799 | 1708 | 1719 | 1326 | 1225 | 1799 | 1708 | 1719 | 1326 | 1225 | 1799 | 1708 | 1719 |
| **330** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **365** | 1715 | 1511 | 2239 | 2046 | 1955 | 1715 | 1511 | 2239 | 2046 | 1955 | 1715 | 1511 | 2239 | 2046 | 1955 |
| **402** | 1962 | 1746 | 2532 | 2379 | NA | 1962 | 1746 | 2532 | 2379 | NA | 1962 | 1746 | 2532 | 2379 | NA |

# Model

## HCF

Fans shall be Model HCF Housed Centrifugal High Pressure/High Volume Fan utilizing either a backward curved or airfoil bladed impeller, as manufactured by Twin City Fan & Blower, Minneapolis, Minnesota.

**PERFORMANCE** — Performance ratings shall conform to AMCA Standard 208 (fan energy index), 211 (air performance) and 311 (sound performance). Fans shall be tested in accordance with ANSI/AMCA Standard 210 (air performance) and 300 (sound performance) in an AMCA-accredited laboratory. Fans shall be licensed to bear the AMCA certified ratings seal for sound, air and Fan Energy Index (FEI).

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

**CONSTRUCTION** — Fan housings and bearing pedestals shall be heavy-gauge, formed steel and welded construction. Housings shall be suitably braced to prevent vibration or pulsation. Discharge flanges shall be provided for rigidity and duct connection. Discharge flanges are punched as standard. All units are furnished with lifting lugs.

**IMPELLER** — Backward curved (BC) impellers shall be single thickness, designed for maximum efficiency and quiet operation. The HCF will also offer an airfoil (AF) type impeller of extruded aluminum designed for maximum efficiency and quiet operation. All impellers shall be statically and dynamically balanced.

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

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

**DRIVE** — Motor sheaves shall be cast iron, variable pitch on applications 20 HP and smaller, and fixed pitch on 25 HP and larger. Drives and belts shall be located external to the fan casing and rated for 150% of the required motor HP.

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

**ACCESSORIES** — When specified, accessories such as access doors, drains, inlet and outlet flanges, belt guards, shaft and bearing guards, outlet screens, outlet dampers, spark resistant construction, x-split housings, high temperature construction, shaft seals, inlet boxes and shaft coolers shall be provided by Twin City Fan & Blower to maintain one-source responsibility.

**FACTORY RUN TEST** — All fans prior to shipment shall be completely assembled and test run as a unit at the specified operating speed or maximum RPM allowed for the particular construction type. Each impeller shall be statically and dynamically balanced in accordance with ANSI/AMCA 204-96 “Balance Quality and Vibration Levels for Fans” to Fan Application Category BV-3, Balance Quality Grade G6.3. Balance readings shall be taken by electronic type equipment in the axial, vertical and horizontal directions on each of the bearings. Records shall be maintained and a written copy shall be available upon request.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