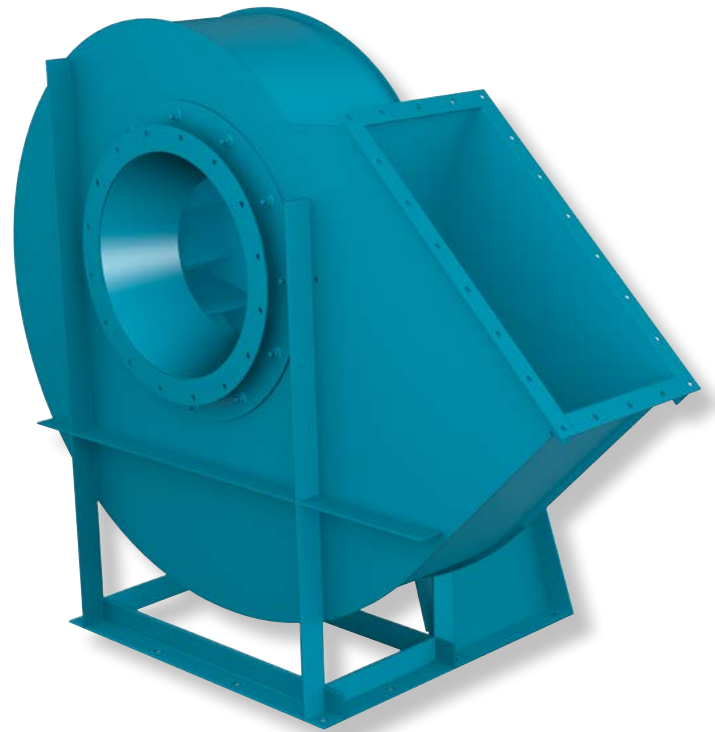




INDUSTRIAL PROCESS AND  
COMMERCIAL VENTILATION SYSTEMS

# HIGH EFFICIENCY INDUSTRIAL AIRFOIL FANS

Model HAF



## Overview

HAF

Model HAF fans from Twin City Fan & Blower employ a high efficiency HAF non-overloading airfoil impeller in a ruggedly constructed fan housing. These fans are designed to handle clean air.

### Features

- Heavy-gauge, all-welded, high-efficiency, non-overloading airfoil impellers are provided on all sizes and arrangements.
- Statically and dynamically balanced rotor assembly.
- Heavy-duty self-aligning grease lubricated anti-friction pillow block bearings. See page 13 for sizes and types.
- Shaft turned ground, polished and straightened to close tolerances.
- Heavy-gauge reinforced housing and bearing pedestal for vibration-free service.
- All arrangements include our standard shaft seal.
- Flanged inlet and outlet.
- Lifting lugs.

### Typical Applications Include

Product Cooling, Fluidizing Systems, Solvent Recovery Systems, Moisture Blow-Off, Forced Draft, Dryer Applications, Recirculation Systems

### Arrangements

Available in Arrangement 1, 9F and 9H (Belt Driven) and Arrangement 3SI, 4, 7SI and 8 (Direct Drive) configurations

### Impeller Type

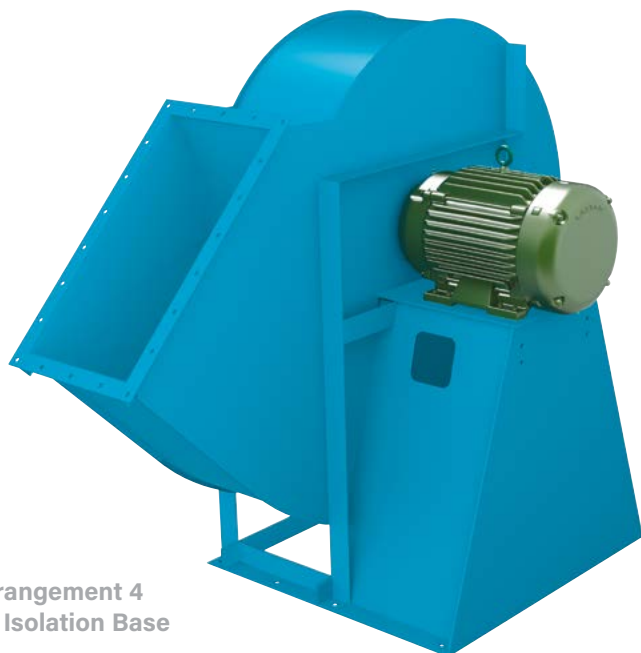
Airfoil

### Optional Construction

Abrasion Resistant Construction, High Temperature Construction, Nominally Leak-Tight Construction, Spark Resistant Construction (Type A, B and C), Special Materials, Special Coatings



For complete product performance, drawings and available accessories, download our Fan Selector software at [tcf.com](http://tcf.com).



Arrangement 4  
on Isolation Base



HAF High Efficiency  
Airfoil Impeller



Arrangement 8

## Overview

### HAF

#### Capabilities

- Airflow up to 160,000 CFM
- Impeller diameters from 25" to 82"
- High temperature construction to 600°F available

#### Class 30

- Suitable to 23,000 FPM tip speed
- Static pressure to 30" w.g.

#### Class 40

- Suitable to 27,800 FPM tip speed
- Static pressure to 40" w.g.

#### Class 50

- Suitable to 29,700 FPM tip speed
- Static pressure to 50" w.g.



Automotive Paint Booth

## Energy Regulations

Twin City Fan & Blower supports energy efficiency regulations enacted by the Department of Energy (DOE) and energy commissions of 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 efficiency requirements. Twin City Fan & Blower has made significant investments in product testing to assure users will receive the most efficient products available. Developments in the Fan Selector software are in place to help aid in product selection to meet the efficiency requirements as stipulated in the regulations. Visit [tcf.com](http://tcf.com) for the latest on fan energy efficiency regulations.



### Spark Resistant Construction

Type 'C' spark resistant is available per AMCA standard 99. Twin City Fan offers type 'C' suitable to 600°F. Consult factory where nonferrous metal other than aluminum is specified. Type 'B' is NOT available.

### Nominally Leak Tight Construction

A 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 (provided and designed by others) for proper installation and vibration-free fan operation.

### Split Housings

Size 220-330 fans are designed to permit impeller removal through the fan inlet. Sizes 360 and larger are standard with a pie-shaped split housing, which allows removal of the impeller and shaft without disconnecting the inner and outlet ductwork. A pie-split housing is required with fans utilizing an integral inlet box.

### High Temperature Modifications

Air stream temperatures of 301-500°F are modified to use high temperature grease, expansion and non-expansion bearings and shaft cooler. Twin City Fan & Blower standard paint is suitable up to 500°F. Air stream temperatures of 501-600°F use the same construction as above with the addition of high temperature paint. Consult factory for applications above 600°F. Arrangement 4 fans are not suitable for applications above 150°F.



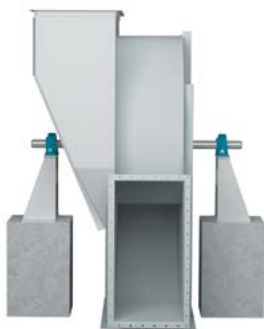
Shaft Cooler & Safety Guard

## ARRANGEMENTS



### Arrangement 1

The usual choice for many V-belt drive applications. Impeller is overhung with two bearings on the base. The motor can be mounted in any of the four AMCA standard motor positions, w, x, y or z. Arrangement 1 is also available as a direct drive with a concrete motor pedestal by others.

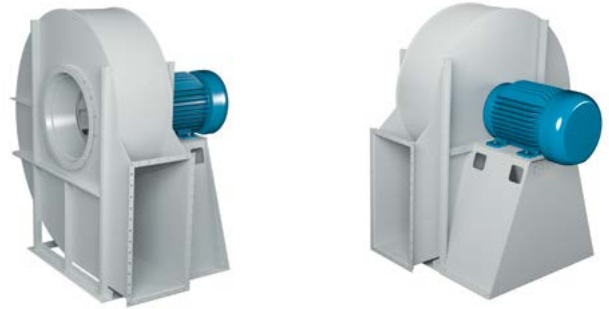


### Arrangement 3SI (Direct Drive)

Single-width, single-inlet fan with integral inlet box and two independent bearing pedestals. The impeller is supported between two bearings.

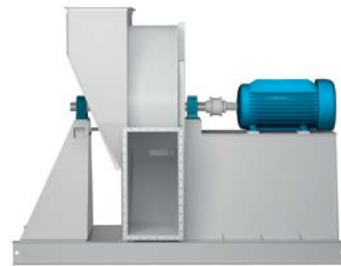
## Arrangement 4 (Direct Drive)

Arrangement 4 is available in direct drive only. The fan impeller is mounted directly on the motor shaft with the motor mounted on a pedestal. An Arrangement 4 design offers low maintenance as there are no fan bearings, fan shaft or drive parts to maintain.



## Arrangement 7SI

Direct coupled with a flexible coupling. A single-width, single-inlet fan with an integral inlet box and independent bearing pedestal and bearing/motor pedestal installed on a common base. The impeller is supported between two bearings.



## Arrangement 8

Direct coupled with a flexible coupling. Variations in impeller widths are available to match designed performance at motor speeds. Characteristic curves showing performances at direct drive speeds are available the Twin City Fan & Blower Fan Selector Software.



## Arrangement 9F

Arrangement 9F uses an extended fan base to accommodate the motor for horizontal mounting, similar to an Arrangement 1 fan. Typically, the motor is mounted on the left side of the pedestal for CW rotation and the right side for CCW rotation.



## Arrangement 9H

Arrangement 9H uses an extended fan base to accommodate the motor for horizontal mounting, similar to an Arrangement 1 fan. Typically, the motor is mounted on the left side of the pedestal for CW rotation and the right side for CCW rotation.

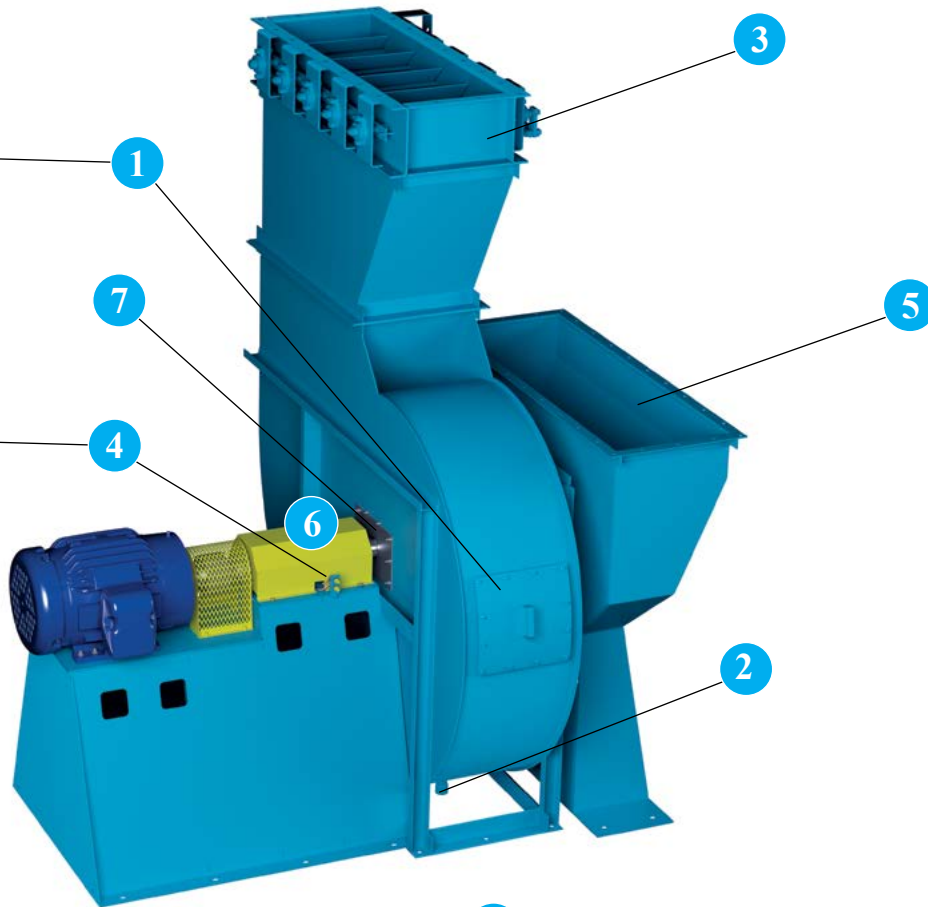




**Bolted Access Door**



**Extended Lube Lines**

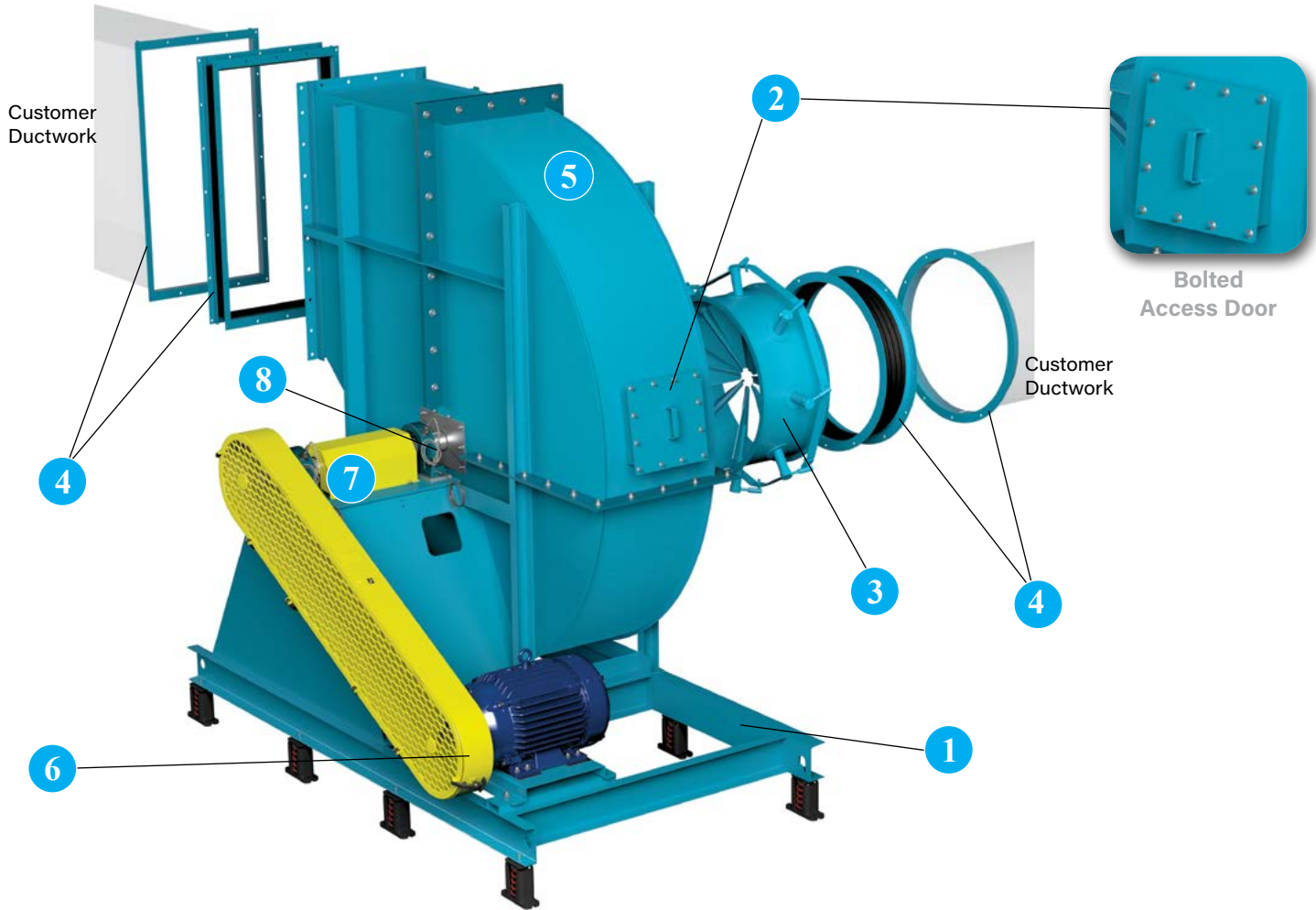


- 1 Bolted Access Door** For quick impeller inspection and maintenance. Access doors are specified where examination and cleaning of the fan interior is required.
- 2 Drain w/ Plug** A two inch drain allows drainage of grease to the lowest point of the fan. Drain is located at the lowest point of the housing.
- 3 Evasé with Damper** The evasé is usually fabricated by the customer as a part of the ductwork. The fan outlet must be expanded to equal the evasé area shown in the catalog to obtain the rated performance. Construction is of the same gauge as fan housing when purchased from the factory. (Do not use if ductwork is smaller than evasé.)
- 4 Extended Lube Lines** Allow for easy lubrication of bearings on belt driven units without disassembly by extending polyethylene lines from fan bearings to exterior of base.

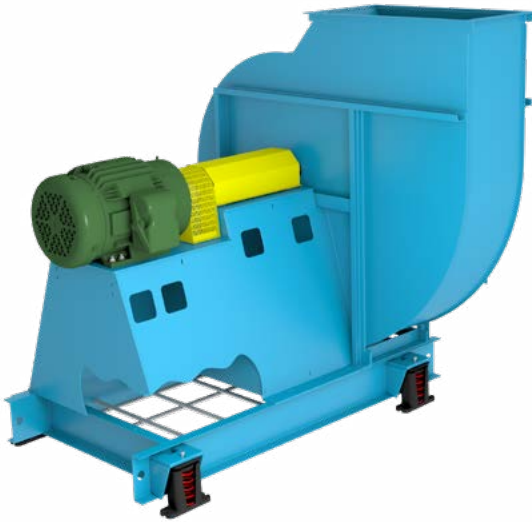
- 5 Inlet Box (Bolt-On)** Designed to minimize pressure drop and are recommended for applications where uniform flow is difficult to obtain due to limited space. Inlet boxes can be designed to be either detachable or integral to the fan.
- 6 Shaft & Bearing Guard** Sheet metal guards cover shaft and bearings and come with extended lube lines to a common point outside of the guard. A guard spanning the shaft between the bearings is available to provide open access to bearings for lubrication and vibration monitoring.
- 7 Shaft Seal** Reduces leakage and protects the bearings from a contaminated airstream. Standard seals are constructed of Tetraglas compressed between an aluminum cover plate and the fan housing. The standard shaft seal is not gas tight. Special seals are available for low leakage applications requiring more protection.

**Other Accessories Include:**

- Inlet/Outlet Screens
- Oil Recirculation Unit
- Horizontal and Three-Way Split



- 1 Base - Isolation** Heavy structural base for fan, motor and drive is designed for use with spring isolators. Use of flexible connectors at inlet and outlet is required on fans with isolators. Available in Arrangements 1, 4 and 9H.
- 2 Bolted Access Door (Raised 4")** For quick impeller inspection and maintenance. Access doors are specified where examination and cleaning of the fan interior is required.
- 3 External Inlet Vane** For reduced flow situations with relatively clean air, inlet vane type dampers are available to maintain fan efficiency. The inlet vanes are external type attached to the inlet of the fan. Standard construction inlet vanes are suitable in applications up to 300°F. High temperature inlet vanes are also available for temperatures up to 600°F.
- 4 Inlet/Outlet Companion Flanges & Flex Connectors** Companion flanges are commonly connected to a user's duct for easy installation of flexible connections between the fan and duct. Companion flanges and flex connectors are punched to match the fan's inlet or outlet punching.
- 5 Pie-Split Housing** Available for impeller removal without disturbing inlet or outlet duct. All fans are designed for removal of impellers through inlet as standard. Where access to inlet is limited or for fans with inlet box, pie-shaped split housing is recommended. Other split housing options available. Consult factory for options.
- 6 Quick Access Belt Guard** Belt guard protects personnel from the moving drive parts. OSHA and quick access guards are available. Arrangement 10 offers a standard belt guard.
- 7 Shaft Guard (Exposed Bearings)** Sheet metal guard spanning the shaft between the bearings to provide open access to bearings for lubrication and vibration monitoring. A full guard to cover shaft and bearings is available.
- 8 Temp. & Vibration Detectors** Thermocouples or RTDs can be installed on the bearings. Various types of vibration switches are also available.



## **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.



## **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 the inlet and outlet are required. Vibration isolation bases require spring or rubber-in-shear type isolators that are designed to limit forces transmitted to the support structure of an operating fan.



## **Unitary Bases**

A 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.



## Integrated

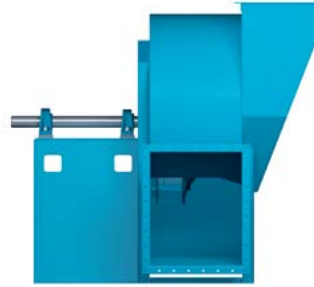
Arrangement 1 fan with attached or integral inlet box. Can be supplied in Arrangement 8.

## Detached Bolt-On

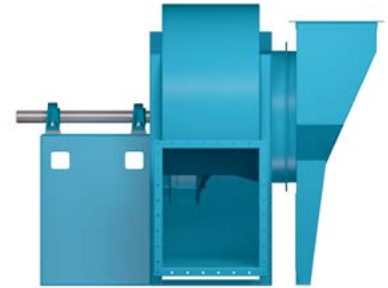
Arrangement 1 fan with detached inlet box. Can be supplied in Arrangement 8.

## Detached Free-Standing

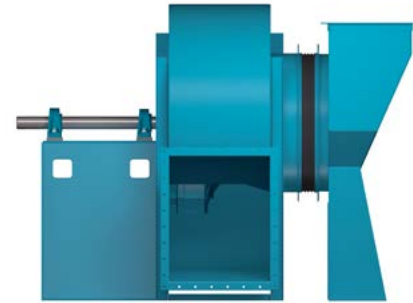
Self-supporting units with independent mounting frames.



Integrated

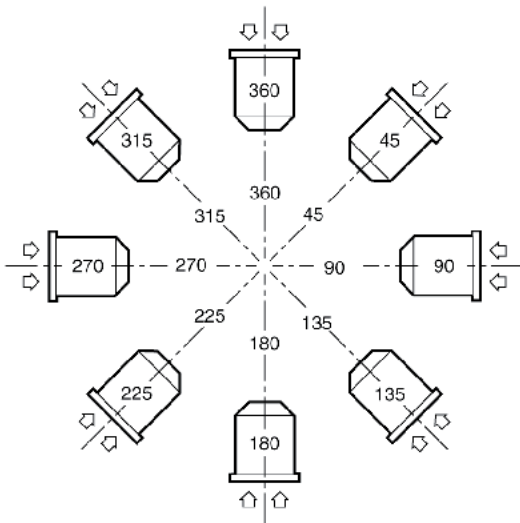


Detached Bolt-On



Detached Free-Standing

## Inlet Box Positions For Centrifugal Fans



INLET BOX POSITIONS AND DESCRIPTIONS	
45	Angular Down Intake
90	Horizontal Right Intake
135	Angular Up Intake
180	Bottom Up Intake
225	Angular Up Intake
270	Horizontal Left 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° in some cases interfere seriously with floor structure.



Safe Impeller RPMs for HAF at 70°F (Use for Temperature Derating of impeller only)

SIZE	IMPELLER DIAMETER	CLASS 30	CLASS 40	CLASS 50
220	25.00	3410	4000	4367
240	27.50	3100	3700	3970
270	30.38	2806	3349	3594
300	33.50	2545	3037	3259
330	37.00	2304	2750	2951
360	46.00	2140	2590	2770
400	45.25	1939	2347	2510
450	50.60	1755	2124	2271
490	55.13	1592	1926	2060
540	61.00	1438	1741	1862
600	67.50	1300	1573	1800
660	74.25	1182	1430	1530
730	82.00	1070	1295	1385



**Note:** The maximum RPM's in Table above are to be used for temperature derating of impeller only. Refer to tables below for maximum fan RPM.

### Fan RPM and HP limits for Belt Driven - Arr. 1

SIZE	CLASS 30		CLASS 40				CLASS 50			
	GREASE BEARINGS		GREASE BEARINGS		OIL BEARINGS †		GREASE BEARINGS		OIL BEARINGS †	
	MAX RPM	MAX HP	MAX RPM	MAX HP	MAX RPM	MAX HP	MAX RPM	MAX HP	MAX RPM	MAX HP
220	2700	40	2700	40	---	---	2700	40	---	---
240	2700	60	2700	60	---	---	2700	60	---	---
270	2700	100	2700	100	---	---	2700	100	---	---
300	2545	125	2700	150	---	---	2700	150	---	---
330	2304	150	2600	200	2700	250	2600	200	2700	250
360	2140	200	2590	250	---	---	2200	200	2700	400
400	1939	250	2200	300	2347	350	2200	350	2510	350
450	1755	300	2000	400	2124	500	2000	400	2271	500
490	1592	350	1926	450	---	---	2000	400	2060	400
540	1438	450	1741	500	---	---	1800	500	1862	500
600	1300	500	1573	500	---	---	1700	500	1800	500
660	1182	500	1430	500	---	---	1530	500	---	---
730	1070	500	1295	500	---	---	1385	500	---	---

### Fan RPM and HP limits for Direct Driven - Arr. 8

SIZE	CLASS 30		CLASS 40		CLASS 50		
	GREASE BEARINGS		GREASE BEARINGS		GREASE BEARINGS		OIL BEARINGS †
	MAX RPM	MAX HP	MAX RPM	MAX HP	MAX RPM	MAX HP	MAX RPM
220	1980	15	3600	100	3600	100	---
240	1980	25	3600	150	3600	150	---
270	1980	40	3300	200	3600	250	---
300	1980	60	3000	250	3000	250	---
330	1980	100	1980	100	*3000	400	---
360	1980	200	1980	200	1980	200	---
400	1800	250	1980	300	1980	300	---
450	*1800	350	1980	500	1980	500	---
490	1500	350	1800	600	1980	600	---
540	*1500	600	1650	800	1800	1000	---
600	1200	500	1500	900	1700	1500	1800
660	*1200	800	1320	1000	1500	1500	---
730	900	500	1200	1250	1320	1750	---

Fans with brake horsepower (BHP) of over 1,000 requires independent bearing pedestals and motor mounted on a concrete pier, provided by others.

\* Impeller requires percent width to reach speed.

† Bearings will require static oil lubrication.

See notes on page 17 for further details and other limitations.

Fan RPM and HP Limits for Direct Drive - Arr. 4

SIZE	CLASS 30		CLASS 40		CLASS 50	
	MAX RPM	MAX HP	MAX RPM	MAX HP	MAX RPM	MAX HP
220	1800	10	3600	100	---	---
240	1800	20	3600	150	---	---
270	1800	30	---	---	3600	200
300	1800	50	---	---	---	---
330	1800	75	---	---	---	---
360	1800	150	---	---	---	---
400	1800	200	---	---	---	---
450	1800	300	---	---	---	---

Impeller Weights (Lbs.) &  $WR^2$  (moment of inertia in lb-ft<sup>2</sup>)

SIZE	CLASS 30		CLASS 40		CLASS 50	
	WEIGHT	WR <sup>2</sup>	WEIGHT	WR <sup>2</sup>	WEIGHT	WR <sup>2</sup>
220	109	56	109	56	115	61
240	125	80	125	80	133	87
270	154	120	159	123	162	128
300	182	179	184	178	192	190
330	235	268	235	267	156	286
360	272	396	301	447	315	469
400	416	707	427	726	451	799
450	495	1069	508	1096	526	1159
490	689	1791	728	1946	729	1930
540	1084	3322	1122	3462	1129	3547
600	1252	4936	1275	5053	1304	5663
660	1627	8147	1641	8037	1582	8325
730	1911	11979	1871	11918	1879	12154



Bare Fan Weights (Lbs.) - Arrangement 1

SIZE	CLASS 30	CLASS 40	CLASS 50
220	972	972	978
240	1154	1154	1162
270	1357	1362	1405
300	1610	1667	1675
330	2001	2049	2060
360	2437	2512	2562
400	3022	3098	3123
450	3680	3853	3872
490	4889	4999	5001
540	6267	6354	6443
600	7535	7650	7975
660	8940	9061	9250
730	10818	11259	11268

Bare Fan Weights (Lbs.) - Arrangement 8

SIZE	CLASS 30	CLASS 40	CLASS 50
220	1132	1550	1557
240	1358	1858	1866
270	1598	2244	2287
300	1985	2602	2610
330	2531	2558	3504
360	3459	3513	3538
400	4277	4285	4310
450	5008	5434	5453
490	6182	6602	6552
540	8036	9347	10100
600	9372	11214	C.F.
660	12397	C.F.	C.F.
730	13225	C.F.	C.F.

C.F. - Consult Factory

Bare Fan Weights (Lbs.) - Arrangement 4

SIZE	CLASS 30	CLASS 40	CLASS 50
220	820	1199	---
240	1025	1456	---
270	1290	---	1912
300	1585	---	---
330	1838	---	---
360	2720	---	---
400	3441	---	---
450	4095	---	---



SIZE	CLASS 30			
	ARR. 1		ARRG. 8	
	SHAFT DIA.	GREASE BEARING	SHAFT DIA.	GREASE BEARING
220	2.1875	RB	1.6875	HDB
240	2.4375	RB	1.9375	HDB
270	2.4375	RB	1.9375	HDB
300	2.6875	RB	1.9375	HDB
330	2.9375	RB	2.1875	HDB
360	3.4375	RB	2.4375	HDB
400	3.4375	RB	2.9375	HDB
450	3.9375	RB	3.4375	SRB
490	4.4375	RB	3.9375	SRB
540	4.4375	SRB	4.4375	SRB
600	4.9375	SRB	4.4375	SRB
660	4.9375	SRB	4.9375	SRB
730	4.9375	SRB	4.9375	SRB

SIZE	CLASS 40				
	ARR. 1			ARRG. 8	
	SHAFT DIA.	GREASE BEARING	OIL BEARING	SHAFT DIA.	GREASE BEARING
220	2.1875	RB	---	2.4375	HDB
240	2.4375	RB	---	2.6875	HDB
270	2.4375	RB	---	2.9375	HDB
300	2.9375	RB	---	2.9375	HDB
330	3.4375	RB <sup>1</sup>	SRB <sup>1</sup>	2.1875	HDB
360	3.4375	RB	---	2.4375	HDB
400	3.9375	RB <sup>1</sup>	SRB <sup>1</sup>	2.9375	HDB
450	4.4375	RB <sup>1</sup>	SRB <sup>1</sup>	3.4375	SRB
490	4.4375	RB	---	3.9375	SRB
540	4.9375	RB	---	4.9375	SRB
600	4.9375	SRB	---	4.9375	SRB
660	4.9375	SRB	---	4.9375	SRB
730	5.4375	SRB	---	5.4375	SRB

SIZE	CLASS 50				
	ARR. 1			ARRG. 8	
	SHAFT DIA.	GREASE BEARING	OIL BEARING	SHAFT DIA.	GREASE BEARING
220	2.1875	RB	---	2.4375	HDB
240	2.4375	RB	---	2.6875	HDB
270	2.4375	RB	---	2.9375	HDB
300	2.9375	RB	---	2.9375	HDB
330	3.4375	RB <sup>1</sup>	SRB <sup>1</sup>	3.4375	HDB
360	3.9375	RB <sup>1</sup>	SRB <sup>1</sup>	2.4375	HDB
400	3.9375	RB <sup>1</sup>	SRB <sup>1</sup>	2.9375	HDB
450	4.4375	RB <sup>1</sup>	SRB <sup>1</sup>	3.4375	RB
490	4.4375	RB <sup>1</sup>	SRB <sup>1</sup>	3.9375	RB
540	4.9375	RB <sup>1</sup>	SRB <sup>1</sup>	4.4375-4.9375 <sup>3</sup>	SRB
600	5.4375	SRB	SRB	4.9375-5.4375 <sup>3</sup>	SRB <sup>2</sup>
660	4.9375	SRB	---	4.9375	SRB
730	5.4375	SRB	---	5.4375	SRB

<sup>1</sup> - Refer to tables on p. 7 for bearing RPM limits and selection.

<sup>2</sup> - Bearing is SRB for static oil lubrication also

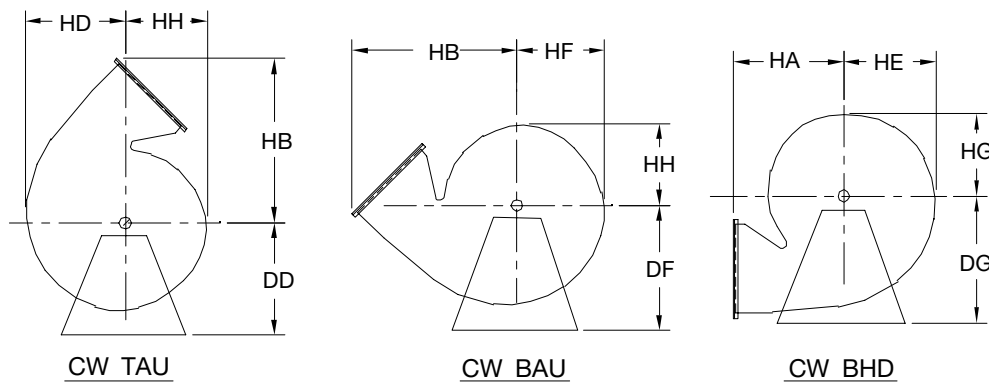
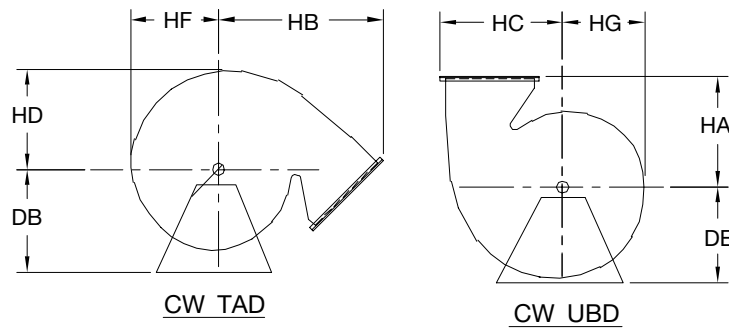
<sup>3</sup> - First number is diameter at drive bearing, second number is diameter at inboard bearing.

RB = Unit Roller Bearings

HDB = Heavy-Duty Ball Bearing

SRB = Spherical Roller Bearing with Split Pillow Block Housing

Housings (Arr. 1, 4 & 8)

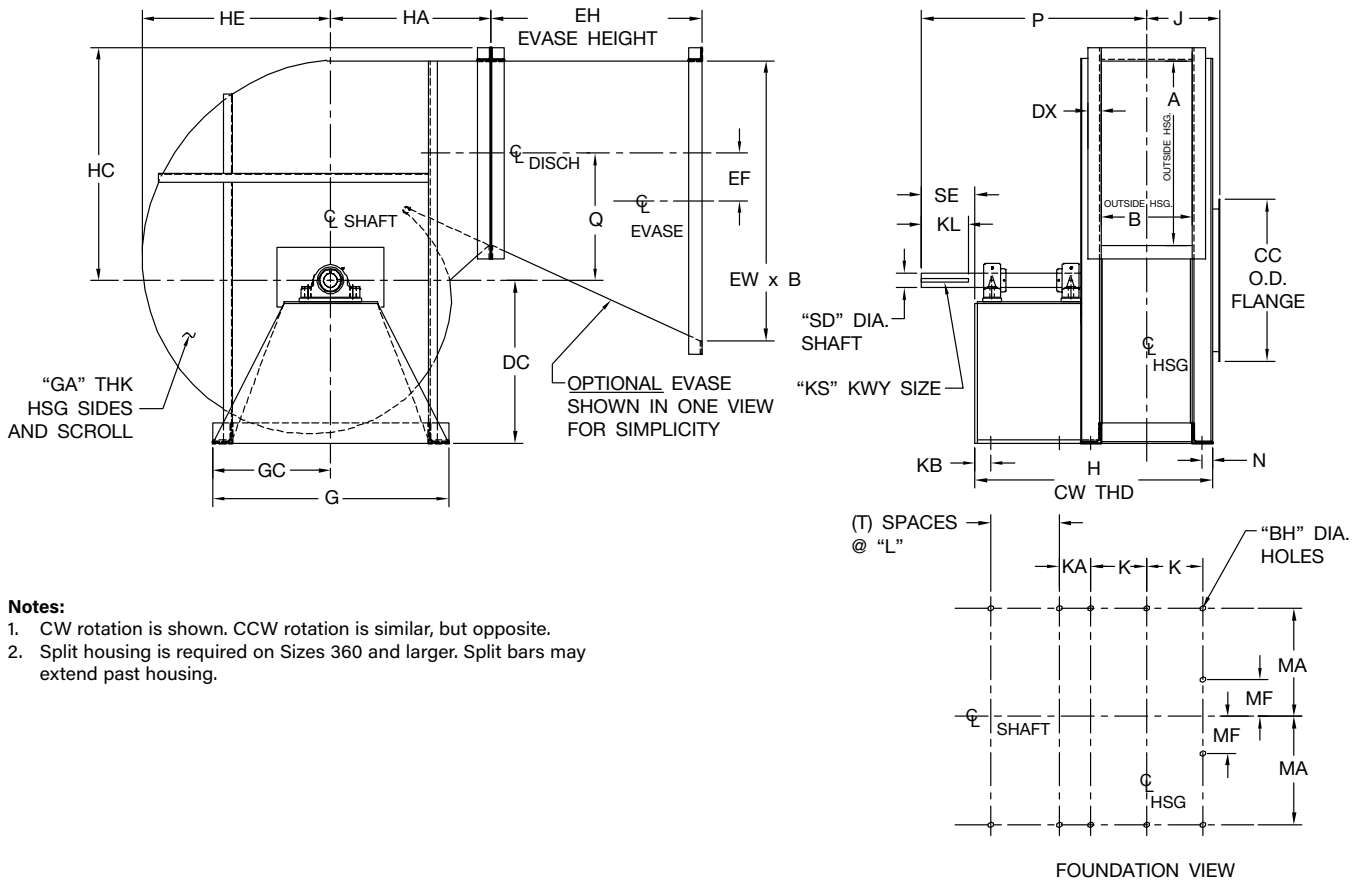


HAF - Housing assembly dimensions (without evasé)

SIZE	DB / DC	DD / DE	DF / DG	HA	HB	HC	HD	HE	HF	HG	HH
220	24.38	29.19	37.44	24.00	41.69	34.94	30.68	28.19	25.63	23.00	20.44
240	26.63	31.94	40.69	26.44	45.69	38.19	33.75	31.00	28.13	25.25	22.44
270	29.19	35.13	44.38	29.14	50.25	41.94	37.19	34.13	31.00	27.81	24.75
300	32.00	38.56	48.50	32.13	55.25	46.00	40.94	37.56	34.13	30.63	27.19
330	35.13	42.44	53.56	35.50	60.88	50.56	45.19	41.44	37.63	33.75	30.00
360	38.69	46.81	58.81	39.31	67.25	55.81	50.00	45.88	41.63	37.31	33.13
400	42.50	51.50	64.88	43.38	74.44	61.88	55.06	50.56	45.88	41.13	36.50
450	46.81	56.75	71.13	48.00	82.06	68.06	60.81	55.81	50.63	45.38	40.31
490	51.38	62.44	77.81	52.75	90.19	74.75	67.00	61.44	55.81	50.00	44.38
540	56.63	68.88	85.44	58.44	99.63	82.44	74.06	67.94	61.69	55.25	49.00
600	62.44	76.06	94.44	64.63	110.31	91.44	81.88	75.13	68.19	61.06	54.19
660	68.50	83.50	103.25	71.06	121.13	100.25	90.00	82.56	74.94	67.13	59.56
730	75.50	92.13	113.94	78.50	133.94	110.94	99.38	91.19	82.75	74.13	65.75

Dimensions are subject to change. Certified drawings available upon request.  
 Larger sizes may require special shipping arrangements due to transportation regulations.  
 CW rotation shown, CCW rotation is similar, but opposite.

Arrangement 1



- Notes:**
1. CW rotation is shown. CCW rotation is similar, but opposite.
  2. Split housing is required on Sizes 360 and larger. Split bars may extend past housing.

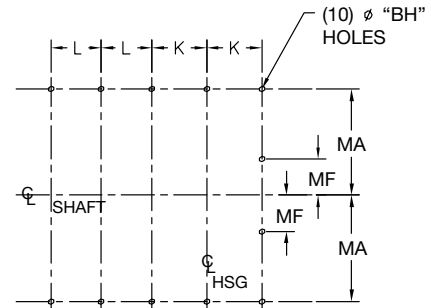
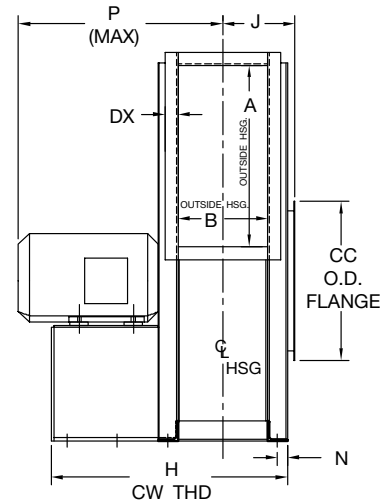
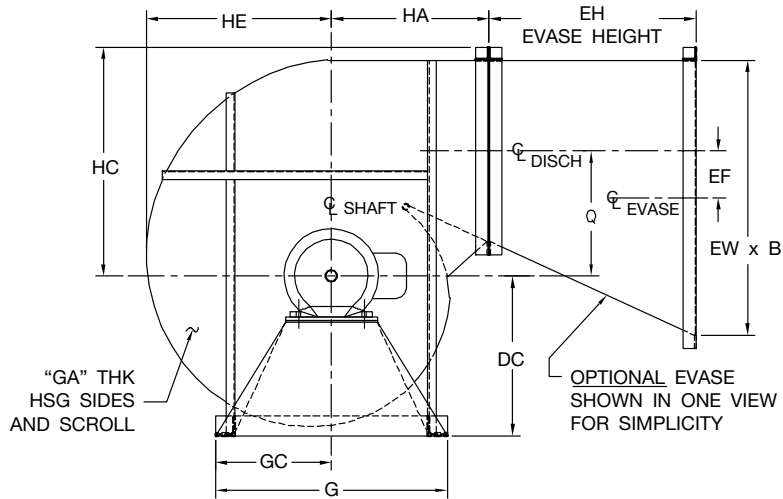
SIZE	A	B	BH	C	CC	DC	EF	EH	EW	G	GA	GC	H	HA	HC	HE	J
220	27.69	13.69	0.81	19.50	24.25	24.38	7.19	31.63	42.00	35.38	0.25	17.69	35.63	24.00	34.94	28.19	8.91
240	30.38	15.00	0.81	21.25	26.25	26.63	7.88	34.81	46.19	38.00	0.25	19.00	38.56	26.44	38.19	31.00	9.59
270	33.50	16.50	0.81	23.50	29.00	29.19	8.75	38.44	50.94	42.00	0.25	21.00	40.50	29.19	41.94	34.13	10.68
300	36.88	18.19	0.81	26.00	30.50	32.00	9.63	42.38	56.13	46.00	0.25	23.00	42.88	32.13	46.00	37.56	11.51
330	40.69	20.00	0.81	28.75	33.00	35.13	10.69	46.81	62.00	50.00	0.25	25.00	45.75	35.50	50.56	41.44	12.53
360	45.06	22.13	1.06	31.75	36.25	38.69	11.81	51.88	68.69	56.00	0.25	28.00	51.19	39.31	55.81	45.88	13.84
400	49.69	24.38	1.06	35.00	39.75	42.50	13.06	57.25	75.75	61.00	0.25	30.50	54.19	43.38	61.88	50.56	15.13
450	54.88	26.88	1.06	38.50	45.25	46.81	14.44	63.25	83.75	68.50	0.25	34.25	61.75	48.00	68.06	55.81	16.61
490	60.44	29.56	1.06	42.75	49.50	51.38	15.94	69.75	92.25	76.50	0.25	38.25	67.81	52.75	74.75	61.44	18.27
540	66.81	32.69	1.06	47.00	53.50	56.63	17.63	77.19	102.06	83.50	0.25	41.75	72.69	58.44	82.44	67.94	20.38
600	73.88	36.13	1.06	52.25	57.75	62.44	19.50	85.38	112.88	91.00	0.25	45.50	78.13	64.63	91.44	75.13	22.47
660	81.19	39.69	1.06	57.50	63.00	68.50	21.50	93.94	124.13	99.00	0.25	49.50	81.06	71.06	100.25	82.56	24.79
730	89.75	43.88	1.06	63.50	70.00	75.50	23.69	103.75	137.13	108.00	0.31	54.00	88.63	78.50	110.94	91.19	27.34

SIZE	K	KA	KB	KL	KS			L	T	MA	MF	P	Q	SE
					30	40	50							
220	8.38	4.75	2.38	7.00	0.50 x 0.25	0.50 x 0.25	0.50 x 0.25	10.25	1	16.19	5.50	33.75	19.06	8.00
240	9.00	4.75	2.38	7.13	0.63 x 0.31	0.63 x 0.31	0.63 x 0.31	11.94	1	17.50	5.50	36.31	21.00	8.25
270	9.75	4.75	2.38	7.13	0.63 x 0.31	0.63 x 0.31	0.63 x 0.31	12.38	1	19.50	6.50	37.50	23.19	8.25
300	10.63	4.75	2.38	7.50	0.63 x 0.31	0.75 x 0.38	0.75 x 0.38	13.00	1	21.50	6.50	39.50	25.56	8.75
330	11.50	5.75	2.38	7.69	0.75 x 0.38	0.88 x 0.44	0.88 x 0.44	13.13	1	23.50	7.50	41.75	28.25	9.00
360	13.06	6.25	2.88	7.63	0.88 x 0.44	0.88 x 0.44	1.00 x 0.50	13.94	1	26.00	7.50	45.13	31.25	9.00
400	14.19	6.25	2.88	8.63	0.88 x 0.44	1.00 x 0.50	1.00 x 0.50	14.69	1	28.50	10.50	48.00	34.56	10.00
450	16.44	6.25	2.88	8.63	1.00 x 0.50	1.00 x 0.50	1.00 x 0.50	8.88	2	32.25	11.50	53.31	38.13	10.00
490	18.75	6.25	3.00	9.63	1.00 x 0.50	1.00 x 0.50	1.00 x 0.50	9.50	2	36.25	12.50	58.06	42.06	11.00
540	20.38	7.25	3.00	9.50	1.00 x 0.50	1.25 x 0.63	1.25 x 0.63	9.88	2	39.75	13.50	61.31	46.56	11.00
600	22.06	7.25	3.00	10.25	1.25 x 0.63	1.25 x 0.63	1.25 x 0.63	10.88	2	43.50	14.50	65.81	51.50	11.75
660	23.88	7.25	3.00	10.50	1.25 x 0.63	1.25 x 0.63	1.25 x 0.63	10.50	2	47.50	14.50	67.19	56.63	12.00
730	25.94	8.25	3.00	10.50	1.25 x 0.63	1.25 x 0.63	1.25 x 0.63	11.75	2	52.00	15.50	72.69	62.56	12.00

BC1002590

Dimensions are subject to change. Certified drawings available upon request.  
Larger sizes may require special shipping arrangements due to transportation regulations.

### Arrangement 4



FOUNDATION VIEW

**Notes:**

1. CW rotation is shown. CCW rotation is similar, but opposite.
2. Split housing is required on Sizes 360 and larger. Split bars may extend past housing.

SIZE	A	B	BH	C	CC	DC	EF	EH	EW	G	GA	GC	H		
													CL - 30	CL - 40	CL - 50
220	27.69	13.69	0.81	19.50	24.25	24.38	7.19	31.63	42.00	35.38	0.25	17.69	30.31	41.19	-
240	30.38	15.00	0.81	21.25	26.25	26.63	7.88	34.81	46.19	38.00	0.25	19.00	35.56	44.31	-
270	33.50	16.50	0.81	23.50	29.00	29.19	8.75	38.44	50.94	42.00	0.25	21.00	38.63	-	50.50
300	36.88	18.19	0.81	26.00	30.50	32.00	9.63	42.38	56.13	46.00	0.25	23.00	42.06	-	-
330	40.69	20.00	0.81	28.75	33.00	35.13	10.69	46.81	62.00	50.00	0.25	25.00	45.00	-	-
360	45.06	22.13	1.06	31.75	36.25	38.69	11.81	51.88	68.69	56.00	0.25	28.00	52.25	-	-
400	49.69	24.38	1.06	35.00	39.75	42.50	13.06	57.25	75.75	61.00	0.25	30.50	59.00	-	-
450	54.88	26.88	1.06	38.50	45.25	46.81	14.44	63.25	83.75	68.50	0.25	34.25	67.88	-	-

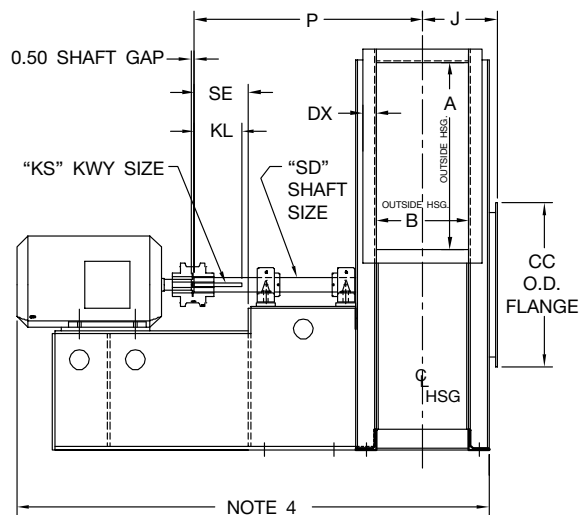
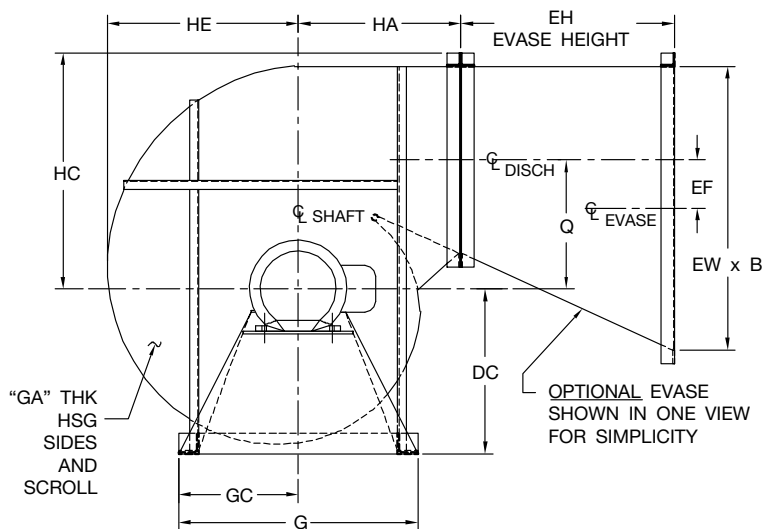
SIZE	HA	HC	HE	J	K	L			MA
						CL - 30	CL - 40	CL - 50	
220	24.00	34.94	28.19	8.91	8.38	5.00	10.00	-	16.19
240	26.44	38.19	31.00	9.59	9.00	7.00	11.00	-	17.50
270	29.19	41.94	34.13	10.68	9.75	7.75	-	13.50	19.50
300	32.13	46.00	37.56	11.51	10.63	8.50	-	-	21.50
330	35.50	50.56	41.44	12.53	11.50	9.25	-	-	23.50
360	39.31	55.81	45.88	13.84	13.06	11.00	-	-	26.00
400	43.38	61.88	50.56	15.13	14.19	13.75	-	-	28.50
450	48.00	68.06	55.81	16.61	16.44	15.50	-	-	32.25

SIZE	MF	N	P			Q	MAX MOTOR FRAME					
			CL - 30	CL - 40	CL - 50		CL - 30		CL - 40		CL - 50	
							MIN	MAX	MIN	MAX	MIN	MAX
220	5.50	1.50	24.31	39.63	-	19.06	182T	215T	324TS	405TS	-	-
240	5.50	1.50	29.81	45.13	-	21.00	182T	256T	364TS	444TS	-	-
270	6.50	1.50	32.88	-	54.00	23.19	254T	286T	-	-	404TS	447TS
300	6.50	1.50	36.19	-	-	25.56	254T	326T	-	-	-	-
330	7.50	1.50	38.88	-	-	28.25	284T	365T	-	-	-	-
360	7.50	2.00	49.94	-	-	31.25	364T	444T	-	-	-	-
400	10.50	2.00	60.44	-	-	34.56	404T	447T	-	-	-	-
450	11.50	2.00	62.06	-	-	38.13	444T	449T	-	-	-	-

BC1002591

Dimensions are subject to change. Certified drawings available upon request.  
 Larger sizes may require special shipping arrangements due to transportation regulations.

## Arrangement 8



SIZE	A	B	C	CC	DC	EF	EH	EW	G	GA	GC	HA
220	27.69	13.69	19.50	24.25	24.38	7.19	31.63	42.00	35.38	0.25	17.69	24.00
240	30.38	15.00	21.25	26.25	26.63	7.88	34.81	46.19	38.00	0.25	19.00	26.44
270	33.50	16.50	23.50	29.00	29.19	8.75	38.44	50.94	42.00	0.25	21.00	29.19
300	36.88	18.19	26.00	30.50	32.00	9.63	42.38	56.13	46.00	0.25	23.00	32.13
330	40.69	20.00	28.75	33.00	35.13	10.69	46.81	62.00	50.00	0.25	25.00	35.50
360	45.06	22.13	31.75	36.25	38.69	11.81	51.88	68.69	56.00	0.25	28.00	39.31
400	49.69	24.38	35.00	39.75	42.50	13.06	57.25	75.75	61.00	0.25	30.50	43.38
450	54.88	26.88	38.50	45.25	46.81	14.44	63.25	83.75	68.50	0.25	34.25	48.00
490	60.44	29.56	42.75	49.50	51.38	15.94	69.75	92.25	76.50	0.25	38.25	52.75
540	66.81	32.69	47.00	53.50	56.63	17.63	77.19	102.06	83.50	0.25	41.75	58.44
600	73.88	36.13	52.25	57.75	62.44	19.50	85.38	112.88	91.00	0.25	45.50	64.63
660	81.19	39.69	57.50	63.00	68.50	21.50	93.94	124.13	99.00	0.25	49.50	71.06
730	89.75	43.88	63.50	70.00	75.50	23.69	103.75	137.13	108.00	0.31	54.00	78.50

**Notes:**

1. CW rotation is shown. CCW rotation is similar, but opposite.
2. Split housing is required on Sizes 360 and larger. Split bars may extend past housing.
3. Motor drawing required to determine motor length and foundation plan.
4. Steel pedestal to be filled with concrete if HP > 400 or at engineer's discretion. Concrete by others.
5. Shaft diameter 'SD' for Class 50, Sizes 540 and 600:  
1st number = diameter at motor side bearing  
2nd number = diameter at fan side bearing

SIZE	HC	HE	J	KL			KS		
				CL - 30	CL - 40	CL - 50	CL - 30	CL - 40	CL - 50
220	34.94	28.19	8.91	3.00	3.00	3.00	0.50 x 0.25	0.63 x 0.31	0.63 x 0.31
240	38.19	31.00	9.59	3.00	3.50	3.50	0.63 x 0.31	0.63 x 0.31	0.63 x 0.31
270	41.94	34.13	10.68	3.00	3.50	3.50	0.63 x 0.31	0.75 x 0.38	0.75 x 0.38
300	46.00	37.56	11.51	3.00	3.50	3.50	0.63 x 0.31	0.75 x 0.38	0.75 x 0.38
330	50.56	41.44	12.53	3.50	3.50	4.00	0.63 x 0.31	0.75 x 0.38	0.88 x 0.44
360	55.81	45.88	13.84	4.00	4.00	4.00	0.63 x 0.31	0.88 x 0.44	0.88 x 0.44
400	61.88	50.56	15.13	4.00	4.00	4.75	0.75 x 0.38	0.88 x 0.44	1.00 x 0.50
450	68.06	55.81	16.61	4.00	4.75	4.75	0.88 x 0.44	0.88 x 0.44	1.00 x 0.50
490	74.75	61.44	18.27	4.75	6.00	6.00	1.00 x 0.50	1.00 x 0.50	1.00 x 0.50
540	82.44	67.94	20.38	6.00	6.00	6.00	1.00 x 0.50	1.25 x 0.63	1.00 x 0.50
600	91.44	75.13	22.47	6.00	6.00	6.00	1.00 x 0.50	1.25 x 0.63	1.25 x 0.63
660	100.25	82.56	24.79	6.00	6.00	6.00	1.25 x 0.63	1.25 x 0.63	1.25 x 0.63
730	110.94	91.19	27.34	6.00	6.50	6.50	1.25 x 0.63	1.25 x 0.63	1.25 x 0.63

SIZE	P			Q	SE			SHAFT GAP	MAXIMUM MOTOR FRAME SIZE		
	CL - 30	CL - 40	CL - 50		CL - 30	CL - 40	CL - 50		ALL CLASSES	CL-30	CL-40
220	30.25	30.75	30.75	19.06	4.50	5.00	5.00	0.5	254T	405TS	405TS
240	33.06	33.56	33.56	21.00	5.00	5.50	5.50	0.5	284T	445TS	445TS
270	34.25	34.75	34.75	23.19	5.00	5.50	5.50	0.5	324T	447TS	449TS
300	35.75	36.25	36.25	25.56	5.00	5.50	5.50	0.5	364T	449TS	449TS
330	38.25	38.25	38.75	28.25	5.50	5.50	6.00	0.5	405T	405T	5009A
360	42.13	42.13	42.13	31.25	6.00	6.00	6.00	0.5	447T	447T	447T
400	44.00	44.00	45.00	34.56	6.00	6.00	7.00	0.5	449T	449T	449T
450	49.31	50.31	50.31	38.13	6.00	7.00	7.00	0.5	449T	5011B	5011B
490	54.06	55.06	55.06	42.06	7.00	8.00	8.00	0.5	449T	5808B	5808B
540	58.31	58.31	58.31	46.56	8.00	8.00	8.00	0.5	5808B	5810B	500C
600	62.06	62.06	62.56	51.50	8.00	8.00	8.50	0.5	5808B	450C	500C
660	63.19	63.19	63.69	56.63	8.00	8.00	8.50	0.5	6808C	500C	500C
730	68.69	69.19	69.69	62.56	8.00	8.50	9.00	0.5	5810C	500C	500C

Dimensions are subject to change. Certified drawings available upon request.

BC1002592

Larger sizes may require special shipping arrangements due to transportation regulations.

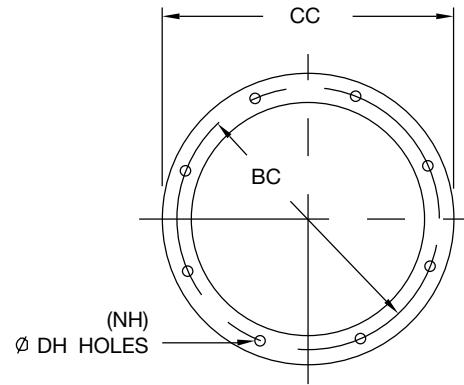


## Inlet & Outlet Flanges

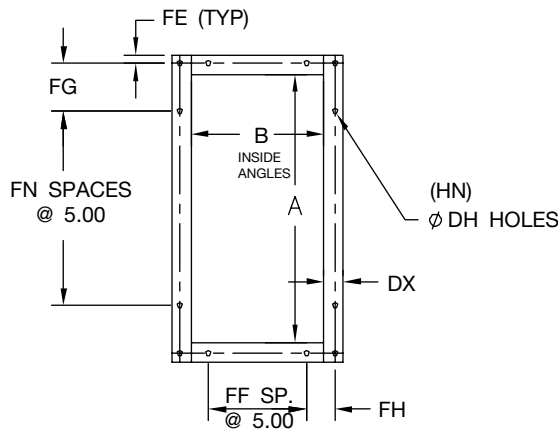
### Flanged Inlet Dimensions

SIZE	CC	BC	NH	DH	FLANGE WIDTH
220	24.25	22.50	12	0.56	2.38
240	26.25	24.50	16	0.56	2.50
270	29.00	27.25	16	0.56	2.75
300	30.50	28.00	16	0.56	2.25
330	33.00	30.75	16	0.56	2.13
360	36.25	33.75	24	0.56	2.25
400	39.75	37.00	32	0.56	2.38
450	45.25	42.50	32	0.56	3.38
490	49.50	46.00	40	0.69	3.38
540	53.50	51.00	40	0.69	3.25
600	57.75	55.50	40	0.69	2.75
660	63.00	60.00	40	0.69	2.75
730	70.00	66.50	48	0.69	3.25

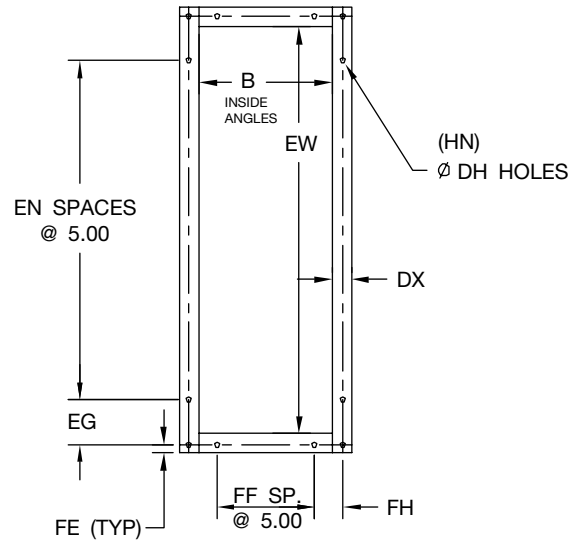
Furnished as standard.



INLET FLANGE



OUTLET FLANGE DETAIL

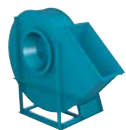


EVASÉ OUTLET FLANGE DETAIL

### Flanged Outlet and Evasé Dimensions

SIZE	A	B	EW	DH	EG	EN	FF	FE	FG	FH	FN	HN		DX
												FAN	EVASÉ	
220	27.69	13.69	42.00	0.56	4.63	7	2	0.88	4.94	3.00	4	16	22	2.00
240	30.38	15.00	46.19	0.56	4.25	8	2	0.88	3.81	3.63	5	18	24	2.00
270	33.50	16.50	50.94	0.56	4.06	9	2	0.88	5.38	4.38	5	18	26	2.00
300	36.88	18.19	56.13	0.56	4.19	10	3	0.88	4.56	2.75	6	22	30	2.00
330	40.69	20.00	62.00	0.56	4.63	11	3	0.88	3.94	3.63	7	24	32	2.00
360	45.06	22.13	68.69	0.56	3.00	13	3	0.88	3.63	4.69	8	26	36	2.00
400	49.69	24.38	75.75	0.56	4.25	14	4	1.13	3.69	3.56	9	30	40	2.50
450	54.88	26.88	83.75	0.56	3.25	16	4	1.13	3.81	4.81	10	32	44	2.50
490	60.44	29.56	92.25	0.69	5.00	17	5	1.13	4.06	3.63	11	36	48	2.50
540	66.81	32.69	102.06	0.69	4.94	19	5	1.13	4.75	5.19	12	38	52	2.50
600	73.88	36.13	112.88	0.69	3.06	22	6	1.38	3.56	4.69	14	44	60	3.00
660	81.19	39.69	124.13	0.69	3.69	24	7	1.38	4.75	4.00	15	48	66	3.00
730	89.75	43.88	137.13	0.69	2.94	27	8	1.63	4.25	3.81	17	54	74	3.50

Dimensions are subject to change. Certified drawings available upon request.  
Outlet flange furnished as standard



## Model HAF

Furnish and install as indicated on the plans, Twin City Fan & Blower Model HAF industrial duty airfoil fans.

**HOUSING** — Fan housings shall be made of heavy-gauge steel with continuously-welded construction and braced with structural shapes to eliminate any resonant vibration and provide smooth operation. Sizes 360 and larger will be furnished with a pie-shaped split as standard. The housing split shall be fully gasketed and bolted together to prevent any leaks. Flanged inlet and outlet shall be provided as standard equipment. Bearing support members shall be fabricated of heavy steel shapes or made of concrete to ensure maximum rigidity.

**IMPELLER** — Blade design shall be airfoil for high efficiency and have non-overloading performance characteristics. Blades shall be die-formed of special alloy material for strength and accuracy of contour and continuously-welded to the impeller inlet cone and backplate. A heavy fabricated steel (not cast iron) hub shall be provided. Impellers shall be statically and dynamically balanced on precision electronic machines, as well as balance tuned after complete assembly.

**SHAFT** — Shafts are to be solid AISI 1040 or 1045 hot rolled steel, accurately turned, ground, polished and ring-gauged for accuracy.

**BEARINGS** — Fans shall be supplied with heavy-duty, self-aligning, grease lubricated, anti-friction, pillow block type bearings selected for a minimum average bearing life (AFBMA L-50) in excess of 200,000 hours at the maximum fan RPM. Sizes 220 through 540 are supplied with ball or roller bearings. Sizes 600 through 730 are supplied with spherical roller bearings with split pillow block housings. Where required, sleeve bearings may be used with appropriate cooling method for high carrying loads.

**DRIVE** — Motor and fan sheaves shall be cast iron. Drives and belts are to be located external to the fan casing and rated for 150% of the required motor HP.

**FINISH & COATING** — The entire fan assembly, excluding the shaft, shall be properly washed and pretreated before application of a rust-preventative primer, if called out on the order. After the fan is completely assembled, a finish coat of paint shall be applied to the entire assembly, if called out on the order. The fan shaft shall be coated with a petroleum-based rust protectant. Aluminum components shall be unpainted.

**ACCESSORIES** — When specified, accessories such as belt guards, access doors, companion flanges, variable inlet vanes, outlet dampers, inlet boxes, inlet box dampers, easés, easé dampers, shaft coolers, shaft seals, closure plates, inlet screens, drains, etc., shall be provided by Twin City Fan & Blower to maintain one source responsibility.

**FACTORY TEST RUN** — All fans prior to shipment shall be completely assembled and test run as a unit at operating speed or maximum RPM allowed for the particular construction type. Each impeller shall be statically and dynamically balanced to balance grade G6.3 or better per AMCA 204. Balance readings shall be taken using electronic type equipment and records shall be maintained of the readings of axial, vertical and horizontal direction on each of the bearings. A written copy of this record shall be available upon request.

**GUARANTEE** — Manufacturer shall guarantee the workmanship and materials for its High Pressure Industrial Airfoil Bladed Fans for at least one (1) year from startup or eighteen (18) months from shipment, whichever occurs first.

## Model

### BCS

#### Sizes (impeller diameters)

16.5 to 89 inches (420 mm to 2,265 mm)

#### Performance

Airflow to 280,000 CFM (475,700 m<sup>3</sup>/hour)  
Static pressure to 40 inches w.g. (9,950 Pa)



See [Catalog 400](#) for more information



## Model

### HIB

#### Sizes (impeller diameters)

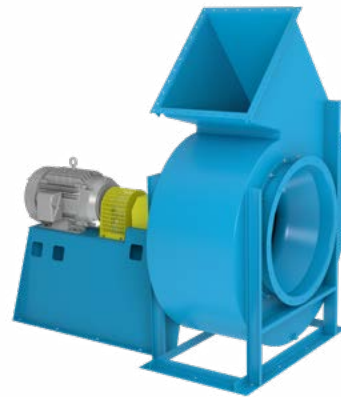
20.5 to 90.75 inches (520 mm to 2,310 mm)

#### Performance

Airflow to 177,500 CFM (301,600 m<sup>3</sup>/hour)  
Static pressure to 36 inches w.g. (8,950 Pa)



See [Catalog 1100](#) for more information



## Model

### MBR

#### Sizes (impeller diameters)

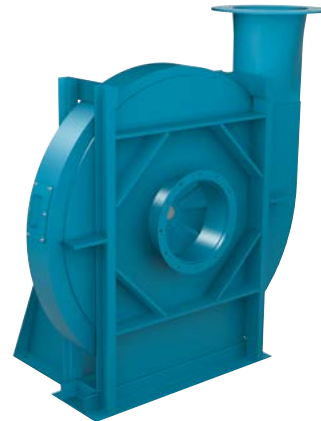
19.63 to 58.94 inches (500 mm to 1,500 mm)

#### Performance

Airflow to 18,000 CFM (30,600 m<sup>3</sup>/hour)  
Static pressure to 180 inches w.g. (44,750 Pa)



See [Catalog 1400](#) for more information



## Model

### BCN

#### Sizes (impeller diameters)

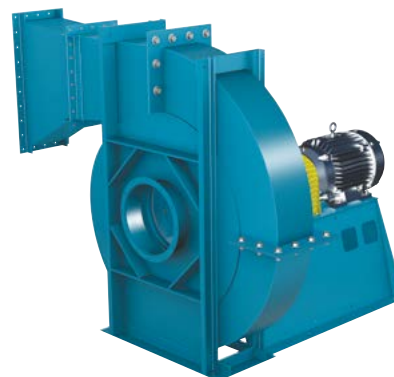
27 to 73 inches (685 mm to 1,855 mm)

#### Performance

Airflow to 75,000 CFM (127,400 m<sup>3</sup>/hour)  
Static pressure to 100 inches w.g. (24,860 Pa)



See [Catalog 1450](#) for more information



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