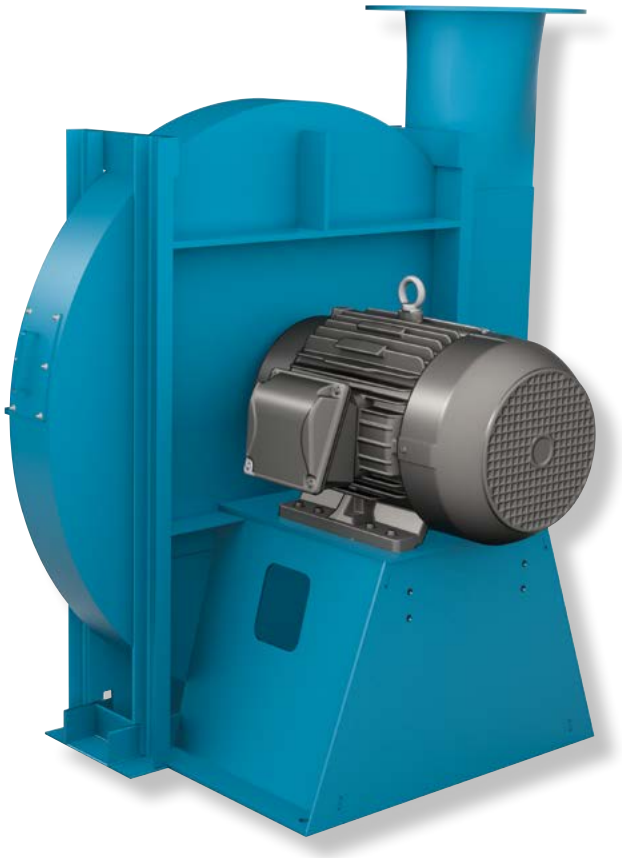
TCF

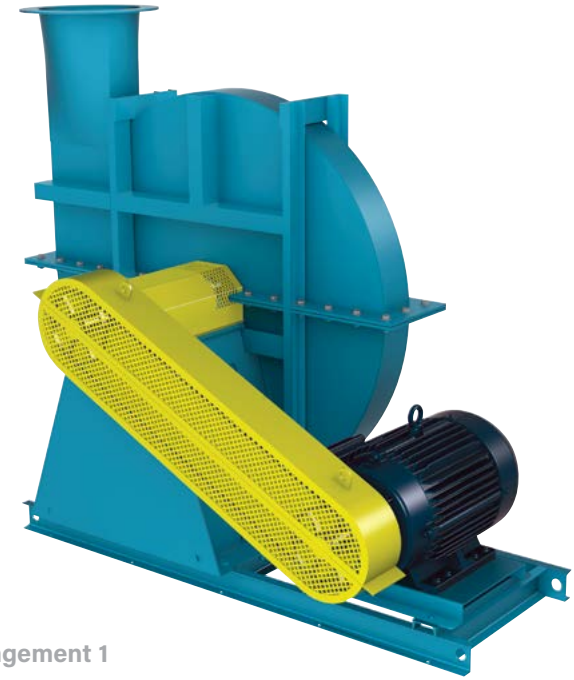
TWIN CITY FAN

INDUSTRIAL PROCESS AND
COMMERCIAL VENTILATION SYSTEMS

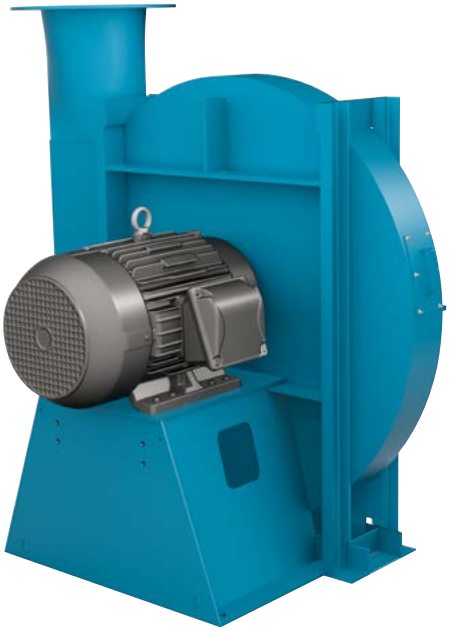
HEAVY-DUTY PRESSURE BLOWERS

MBO | MBR | MBW





MBR
Arrangement 1



MBO
Arrangement 4

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

Overview

MBO I MBR I MBW

Many industrial applications call for reliable, heavy-duty pressure blowers to handle clean or dirty as well as hot airstreams at very high pressures. The models MBO, MBR and MBW radial blade heavy-duty pressure blowers are designed to fulfill this requirement while offering a high degree of reliability. The MB Series fans are specifically designed to handle relatively low flow and high static pressure without having to reduce impeller widths. The Series MB fans offer properly sized inlets and outlets for the specified airflow as well as relatively low speeds.

Typical Industries Include

Air Pollution Control, Asphalt, Boilers, Brick, Cement, Chemical, Coal, Composting, Ethanol, Food & Beverage, Foundry, General Manufacturing, Glass, Industrial Processes, Metal & Minerals, Microchip, Mining, Nuclear, Petrochemical, Pharmaceutical, Power Generation, Pulp & Paper, Recycling, Textile, Transportation, Water Treatment

Arrangements

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

Impeller Types

Radial Bladed Impellers in Open or Shrouded Designs

Optional Construction

High Temperature Construction, Spark Resistant Construction, Split Housing, Special Materials

Energy Regulations

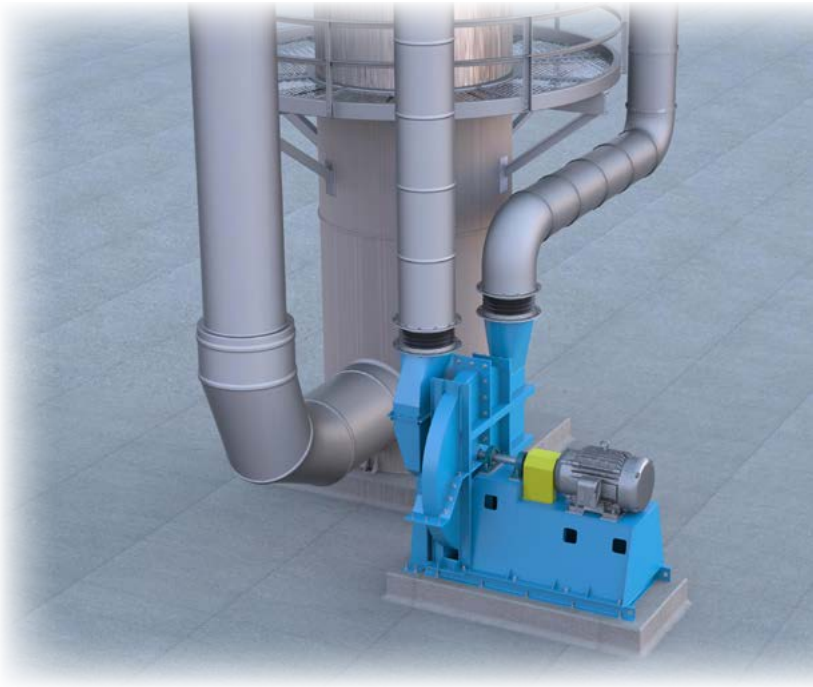
Twin City Fan & Blower supports energy efficiency regulations enacted by the U.S. Department of Energy (DOE) and specific states. The selection and application of fan products is a significant part of these regulations. Engineers and specifiers must understand how to apply TCF products to their specific 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.

Overview

MBO I MBR I MBW

Standard Features

- All-welded heavy-gauge housing, non-rotatable, with structural reinforcements to reduce vibration and minimize distortion due to pressure
- Removable inlet plate for ease of impeller removal from inlet side
- Lifting lugs
- Available in mild steel, stainless steel and other special alloys
- Bearings selected for long, reliable performance
- Variation in impeller diameter (95% to 105%) to match specified performance
- Flanged inlet, flanged outlet
- Felt type shaft seal (shaft seal does not make fan gas-tight)



Kiln Recirculation Fan

Models

MBO
19.63" to 58.94" impeller diameters
Airflow to 18,000 CFM
Static pressure to 170" w.g.

MBR
19.63" to 58.94" impeller diameters
Airflow to 18,000 CFM
Static pressure to 180" w.g.

MBW
19.63" to 58.94" impeller diameters
Airflow to 20,000 CFM
Static pressure to 160" w.g.

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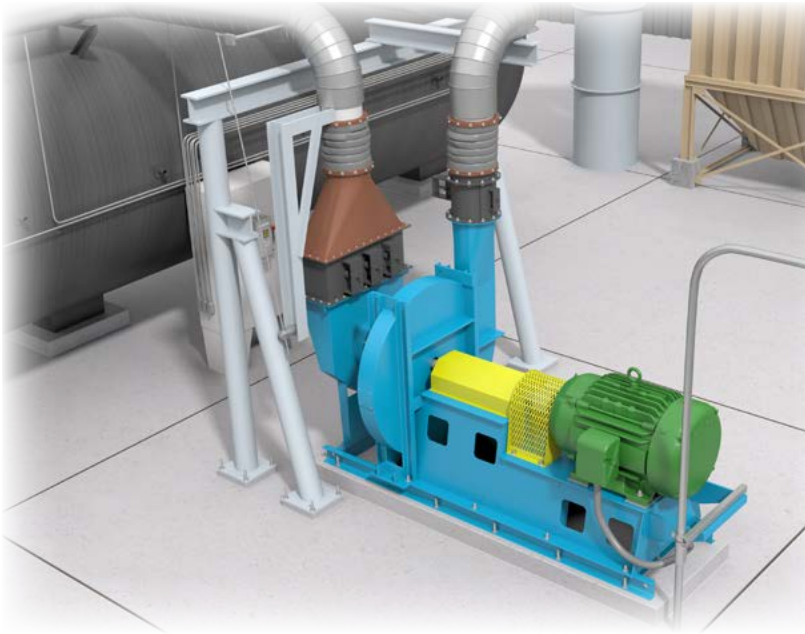
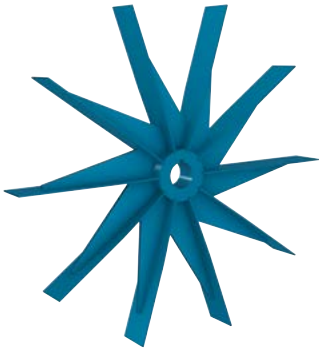


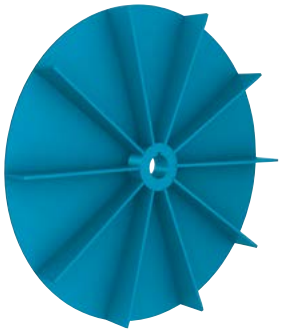
Flue Gas Recirculation

IMPELLER DESIGN



MBO Impeller

MBR Impeller



MBW Impeller

Model MB impellers are continuously-welded and mounted to the shafts using an interference fit or bushing.

MBO Impeller

The MBO impeller has open radial blades supported by heavy gussets. This design offers the maximum in strength and reliability for handling hot, sticky and abrasive airstreams although at a lower efficiency than the other MB impellers.

MBR Impeller

The MBR impeller features heavy-gauge back plate, blades and impeller flange. The impeller flange matches the fan inlet opening to reduce air entry losses. The MBR design develops the most pressure for a given speed and impeller size and offers the highest efficiency. It is ideal for handling clean, hot or particulate-laden air.

MBW Impeller

The MBW impeller features a heavy-gauge back plate with no front plate. The radial blades are constructed of alloy steel. The MBW is ideal for the handling of long, stringy or fibrous materials.

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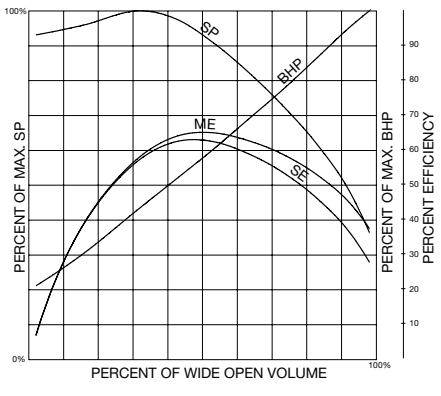
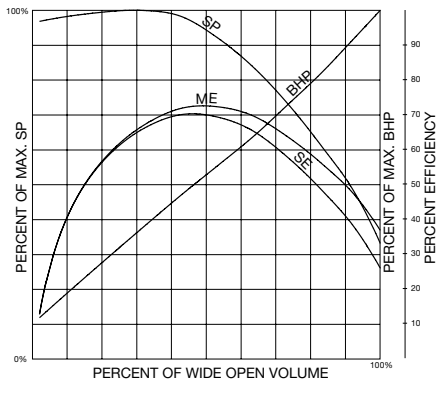
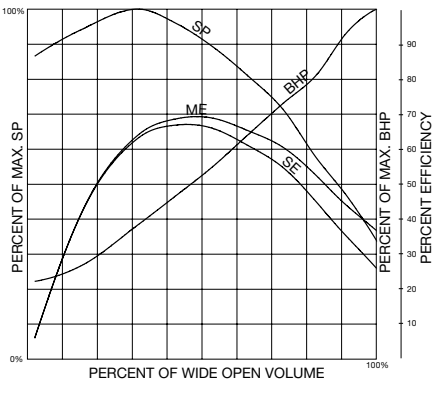
Typical MBO Performance



Typical MBR Performance



Typical MBW Performance



Spark Resistant Construction

Fan applications may involve the handling of 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 airstream must be made of nonferrous material — usually aluminum and limited to 200°F.
Type B - The fan shall have a nonferrous impeller and nonferrous rub ring about the opening through which the shaft passes — usually aluminum impeller and rub ring and limited to 200°F.
Type C - The fan shall be so constructed that a shift of the impeller or impeller or shaft will not permit two ferrous parts of the fan to rub or strike.

High Temperature Modifications

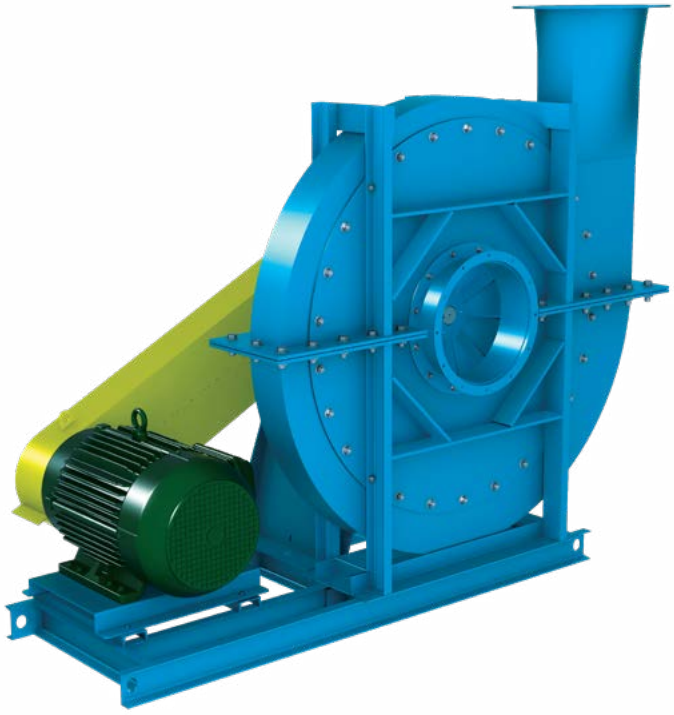
Standard designs are suitable to 180°F for Arr. 4 and 300°F for Arr. 1 and Arr. 8 fans. Units in Arr. 1 and Arr. 8 can be modified, in both steel and stainless steel, to suit applications to 800°F.

Operation at temperatures higher than 70°F adversely affects the strength of fan impellers. As a result, the maximum safe speed from Table 1 on page 13 must be derated as shown in the table below.

301°F to 500°F — Consists of high temperature grease, expansion and non-expansion bearings, shaft seal and shaft cooler.
501°F to 600°F — Consists of the modifications above plus high temperature aluminum paint.
601°F to 800°F — Consists of the modifications above plus an insulation blanket sandwiched between the fan housing and the pedestal to reduce heat conduction. May require pedestal modification.

Derating Factors for Safe Impeller Speed

TEMP (°F)	ALLOY STEEL	STAINLESS STEEL
70	1.00	1.00
200	0.98	0.95
250	0.97	0.93
300	0.96	0.91
400	0.94	0.88
500	0.92	0.84
600	0.89	0.81
700	0.87	0.77
800	0.72	0.75



Shaft Cooler & Safety Guard

Abrasion and Corrosion Resistant Alloys & Coatings

Optional construction includes abrasion resistant steel blades, back plate and fan housing. Construction materials include Corten, stainless steel, Monel, Hastelloy and other alloys. Construction from heavier than standard gauges is available. Special corrosion resistant coatings of various types are available.

Split Housing

Fan sizes 365 and larger are available with horizontal or pie-shaped split housing construction.

ARRANGEMENTS

Arrangement 1

Arrangement 1 is usually 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, W, X, Y or Z. 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 3SI

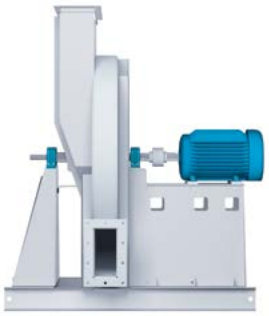
Arrangement 3SI is usually direct drive. Like the Arrangement 3, the impeller is mounted between the bearings. The Arrangement 3SI utilizes an attached inlet box to locate the bearing outside of the airstream on independent bearing pedestals which allows for elevated operating temperatures and relatively clean air. The Arrangement 3SI includes a pie split housing for easy impeller removal. The motor is located by the customer off the fan assembly and direct coupled to the shaft opposite of the inlet box side.

Arrangement 4

Arrangement 4 is a direct drive fan with the impeller mounted on the motor shaft. Arrangement 4 fans are suitable for temperatures to 180°F. Maximum RPM and HP for arrangement 4 fans can be found in Table 2 on page 13.

Arrangement 7SI

Arrangement 7SI is direct drive. Like the Arrangement 3SI, the impeller is mounted between the bearings. The Arrangement 7SI includes an integrated inlet box to locate the bearing outside of the airstream. The pedestal is designed to accommodate the motor, flexible coupling and one bearing. A pie split housing is provided for easy impeller removal. The fan assembly is then mounted on a unitary base as standard. An inertia base is an available option.



Arrangement 8

Arrangement 8 is a direct drive unit with the bearing pedestal extended to accommodate the motor. MBO, MBR and MBW arrangement 8 fans feature motor positioners (shown below) to facilitate easy alignment of the shaft. Maximum RPM and HP for arrangement 8 fans can be found in Table 2 on page 13.

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

BAD
Bottom Angular Down
CW 225

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

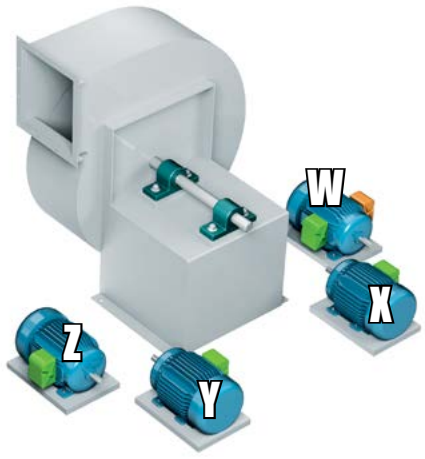
DBD
Downblast
CCW 180

BAD
Bottom Angular Down
CCW 225

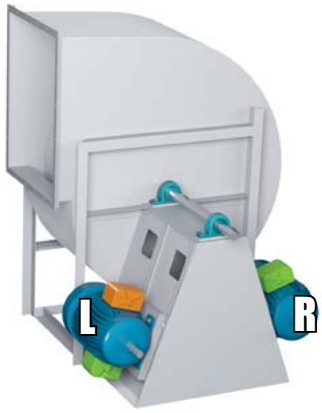
BHD
Bottom Horizontal
CCW 270

BAU
Bottom Angular Up
CCW 315

MOTOR POSITIONS

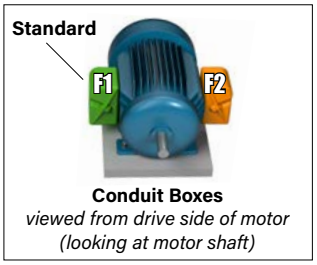


Arrangements 1 & 3



Arrangement 9

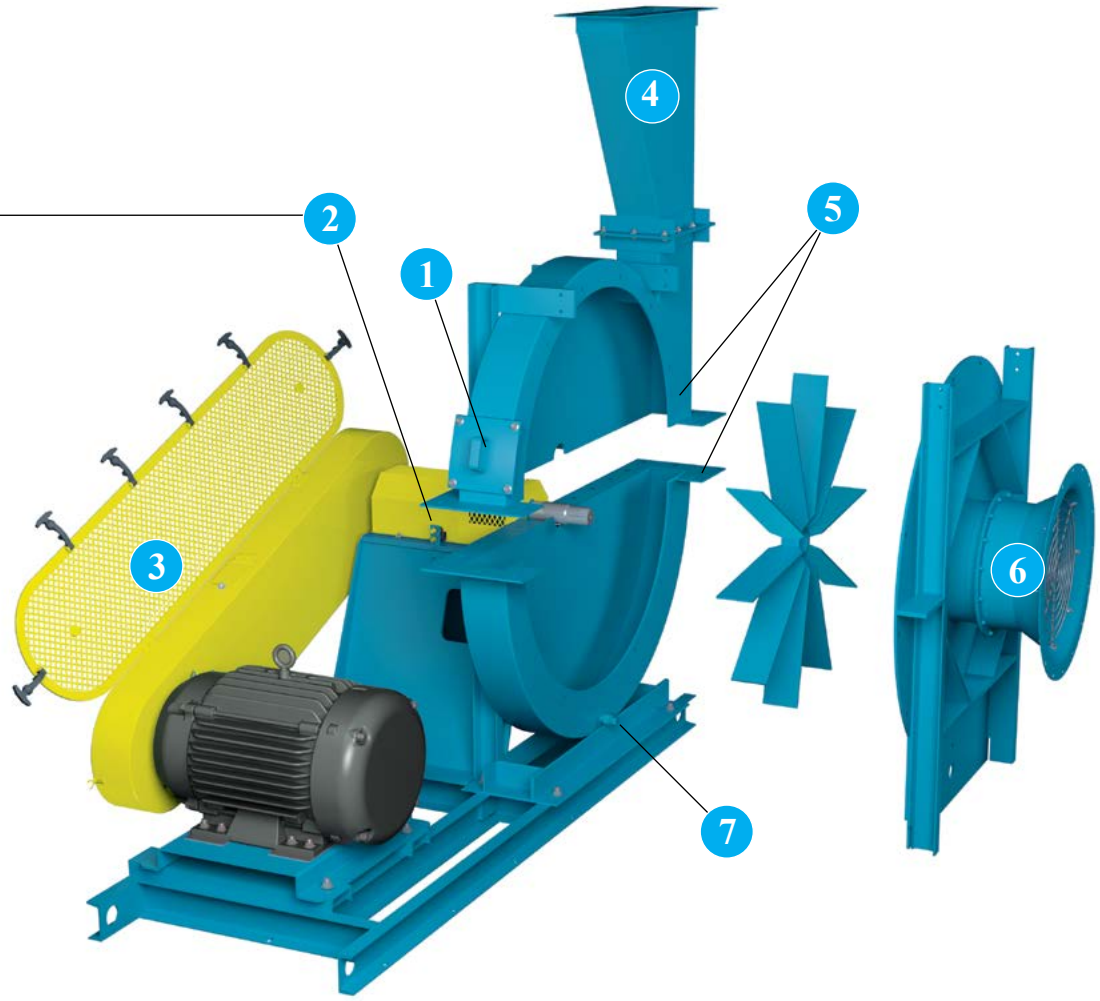
Arrangement 9F



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

OPTIONS/ACCESSORIES

Extended
Lube Lines



1 **Bolted Access Door** Due to the high pressures involved, a quick-opening or hinged type door is not recommended and thus not available.

2 **Shaft Guard, Bearing Guard & Extended Lube Lines** 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.

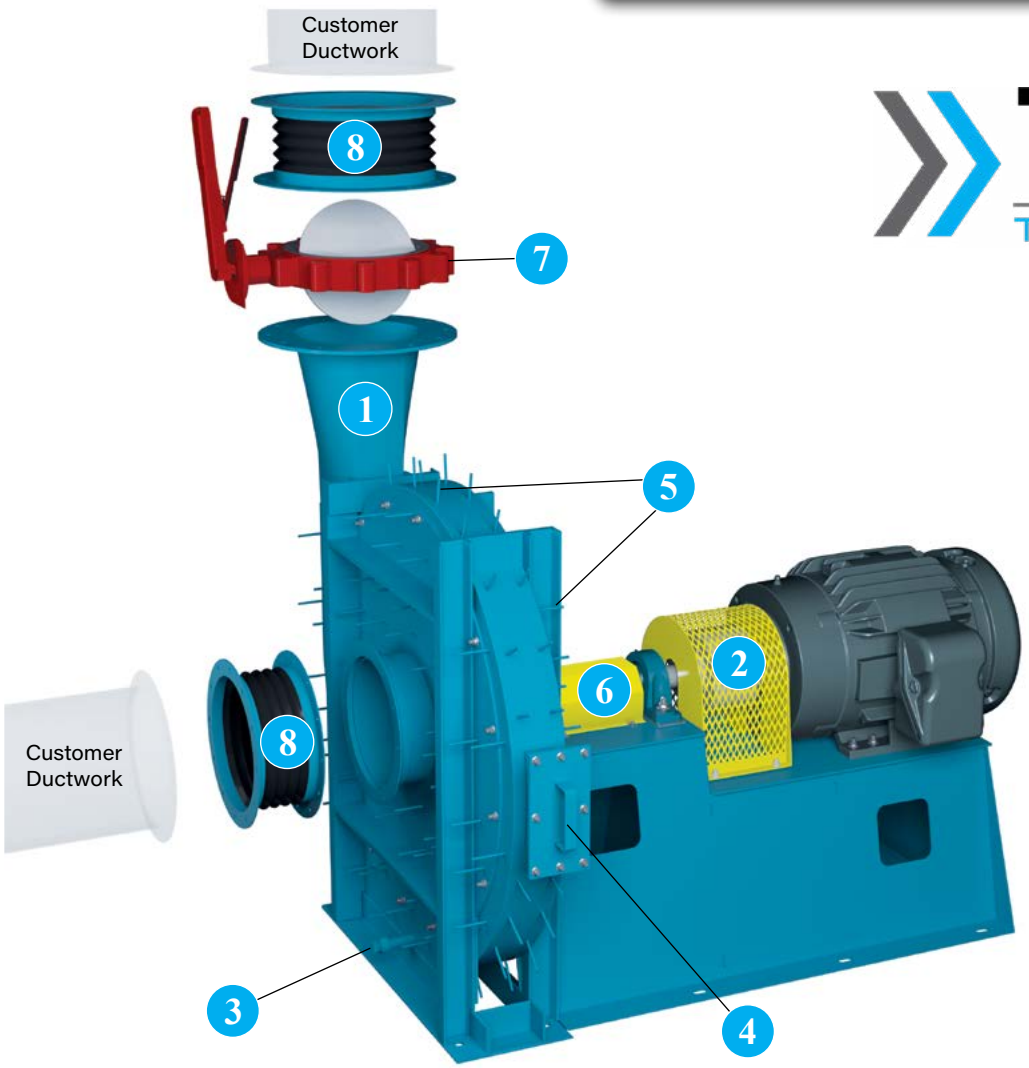
3 **Belt Guard (Quick Access)** Belt guard protects personnel from the moving drive parts. OSHA and quick access guards are available.

4 **Rectangular Evasé** Constructed to the same gauge as the fan housing, includes a punched outlet flange for connecting to ductwork.

5 **Horizontal Split Housing** All sizes are designed to permit impeller removal through the fan inlet. Sizes 365 and larger are available with a horizontal, pie-shaped or 3-way split housing, which allows removal of the impeller and shaft without disconnecting ductwork.

6 **Inlet Bell w/ Screen** On installations with an open inlet, an inlet bell (venturi) is required to achieve the catalog performance. Inlet bell is provided with screen.

7 **3/4 Inch Drain Plug** Threaded pipe coupling welded to the lowest point in the housing scroll.



1 **Round Outlet (Built-In Evasé)** Model MB fans are furnished with a rectangular outlet as standard. However, the performance shown in the catalog is for fans with an optional Evasé to provide static regain and improved static efficiency.

2 **Coupling Guards** are designed to cover the rotating shaft and drive components.

3 **Extended Drain** Threaded pipe coupling welded to the lowest point in the housing scroll, extended to protrude past customer supplied insulation.

4 **Raised Access Doors** For quick impeller inspection and maintenance. Access doors are specified where examination and cleaning of the fan interior is required.

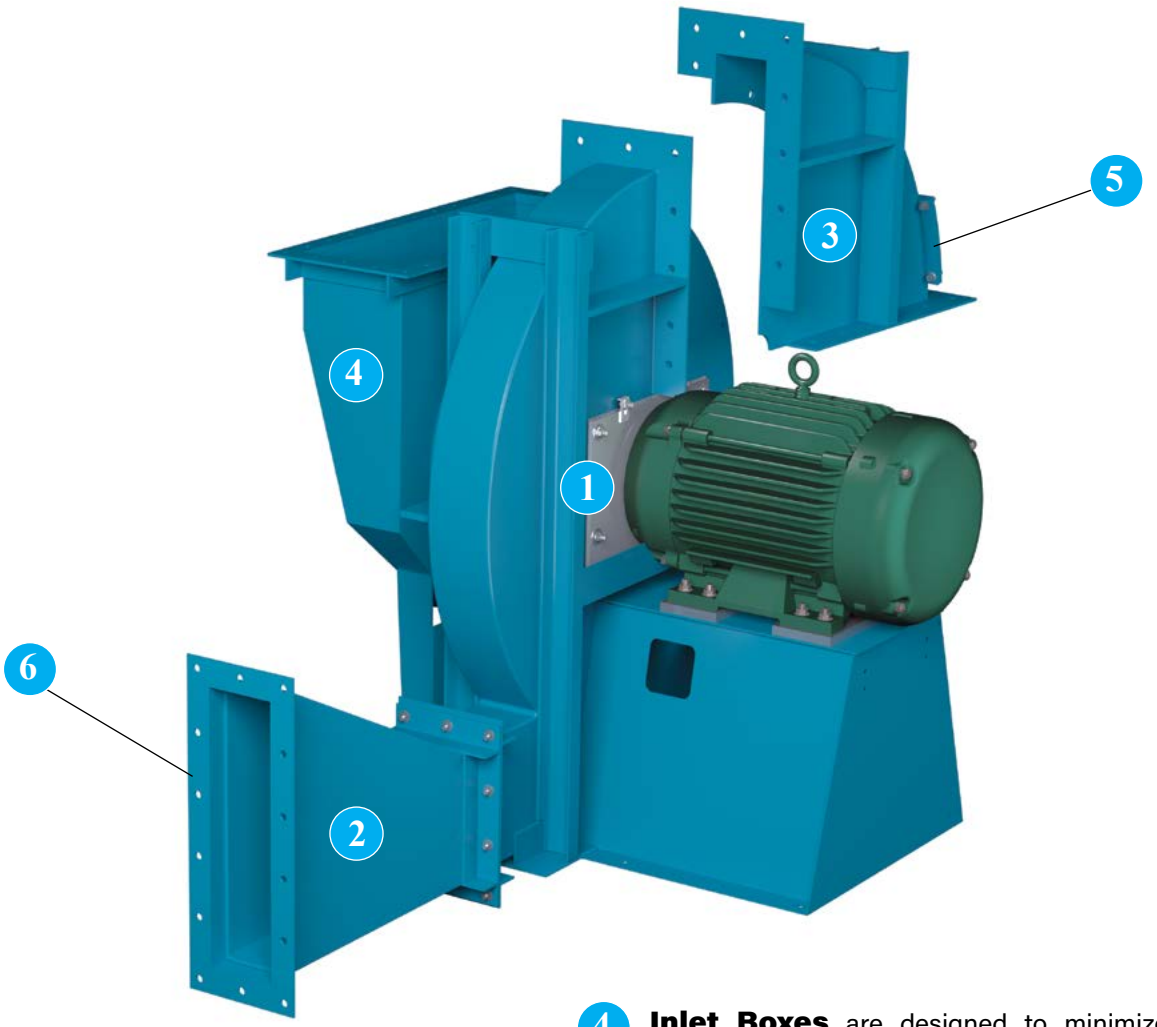
5 **Insulation Pins** Insulation pins are tacked onto fan housing for customer mounted insulation. 4 or 6 inch long insulation pins can be provided. Insulation thickness must be specified at the time of order.

6 **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.

7 **Blast Gate with Handle** A wafer-type butterfly valve for mounting to outlet flange allows controlling flow to full shutoff. Available for automatic control. Maximum temperature 250°F.

8 **Inlet/Outlet Flex Connectors (with Companion Flanges)** are commonly connected to a user's duct for easy installation of flexible connections between the fan and duct. Flex connectors with companion flanges and are punched to match the fan's inlet or outlet punching.

OPTIONS/ACCESSORIES



1 **Shaft Seals** reduce leakage and protect 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.

2 **Rectangular Evasé** Constructed to the same gauge as the fan housing, includes a punched outlet flange for connecting to ductwork.

3 **Split Housing** All sizes are designed to permit impeller removal through the fan inlet. Sizes 365 and larger are available with a horizontal, pie-shaped or 3-way split housing, which allows removal of the impeller and shaft without disconnecting ductwork.

4 **Inlet Boxes** are 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 (shown above) to the fan.

5 **Bolted Access Door** For quick impeller inspection and maintenance. Access doors are specified where examination and cleaning of the fan interior is required.

6 **Flanged Outlet** Punched outlet flanges are welded to the fan outlet.

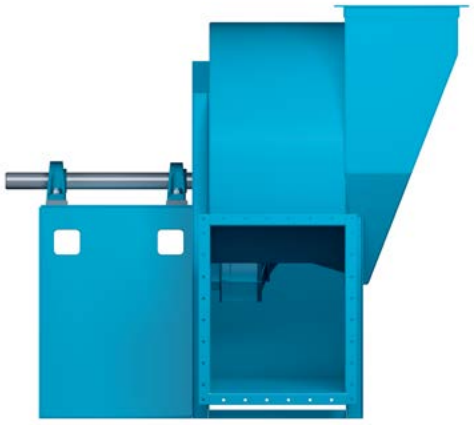
Other Accessories Include:

- Special Coatings
- Bearing RTD (Temperature Sensors)
- Vibration Sensors
- VFD
- V-Belt Drives

Integrated
Arrangement 1 fan with attached or integral inlet box. Can be supplied in other arrangements.

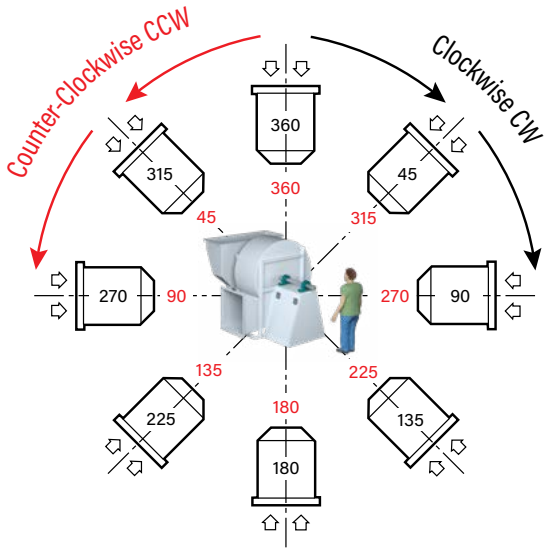
Detached Bolt-On
Arrangement 1 fan with detached inlet box. Can be supplied in other arrangements.

Detached Free-Standing
Self-supporting units with independent mounting frames.



Integrated

Inlet Box Positions For Centrifugal Fans



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

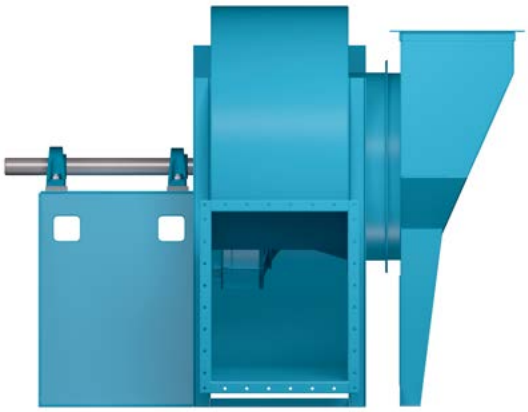
INLET BOX POSITIONS AND DESCRIPTIONS
45 — Angular Down Intake
90 — Horizontal Intake
135 — Angular Up Intake
180 — Bottom Up Intake
225 — Angular Up Intake
270 — Horizontal Intake
315 — Angular Down Intake
360 — Top Down Intake

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

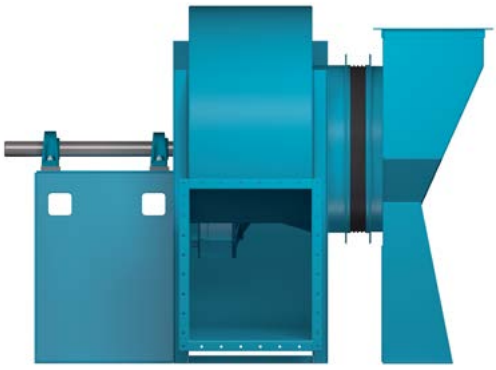
Position of inlet box and air entry to inlet box is determined from drive side of fan.

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

Positions 135° to 225° in some cases interfere seriously with floor structure.



Detached
Bolt-On



Detached
Free-Standing

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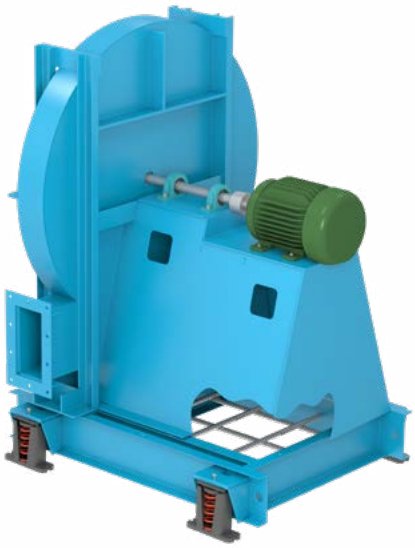
VIBRATION ISOLATION



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.

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.

Table 1. Safe Impeller RPMs for MBO, MBR and MBW @ 70°F
(Use for Temperature Derating of Impeller ONLY)

SIZE	MBO		MBR		MBW	
	ALLOY STEEL	STAINLESS STEEL	ALLOY STEEL	STAINLESS STEEL	ALLOY STEEL	STAINLESS STEEL
196	8292	6409	7095	5484	7790	4845
224	7504	5800	6123	4732	6545	4071
252	6500	5023	5284	4084	5876	3655
280	6109	4721	4762	3681	5255	3269
308	5193	4014	4364	3373	6440	4006
336	4874	3768	3993	3086	5963	3709
365	4589	3547	3784	2925	5264	3274
421	3831	2961	4153	2540	4629	2879
477	3406	2633	2882	2227	3022	1880
533	3098	2394	2588	2000	2678	1666
589	2792	2158	2334	1804	2546	1584

NOTE: The maximum RPMs in Table 1 are to be used for temperature derating of impeller only. Refer to Table 2 for maximum fan RPM.

Table 2. Fan RPM and HP Limits

SIZE	DIRECT DRIVE — ARR. 4 & 8		BELT DRIVEN — ARR. 1	
	RPM LIMIT	HP LIMIT	RPM LIMIT	HP LIMIT
196	3600	10	4000	15
224	3600	20	3500	20
252	3600	30	3000	20
280	3600	50	2500	25
308	3600	75	2500	40
336	3600	125	2500	50
365	3600	200	2500	75
421	3600	400	2500	125
477	1800	75	1800	150
533	1800	150	1800	150
589	1800	250	1800	150

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Table 3. Material Specifications

SIZE	IMPLR DIA.	SHAFT DIA.		HOUSING		MBO		MBR			MBW	
		ARR. 1	ARR. 8	SIDES	SCROLL	BLADE	BLADE SUP-PORT	BLADE	FRONT PLATE	BACK PLATE	BLADE	BACK PLATE
196	19.63	1.687	1.437	0.18	0.18	0.18	0.25	0.18	0.18	0.25	0.18	0.25
224	22.44	1.937	1.437	0.18	0.18	0.18	0.25	0.18	0.18	0.25	0.18	0.25
252	25.25	1.937	1.437	0.18	0.18	0.25	0.38	0.25	0.18	0.25	0.25	0.25
280	28.06	2.187	1.687	0.25	0.25	0.25	0.38	0.25	0.18	0.25	0.25	0.25
308	30.88	2.187	1.687	0.25	0.25	0.25	0.50	0.25	0.18	0.25	0.25	0.25
336	33.69	2.187	2.187	0.25	0.25	0.25	0.50	0.25	0.18	0.25	0.25	0.25
365	36.50	2.437	2.437	0.31	0.25	0.25	0.50	0.25	0.25	0.25	0.25	0.25
421	42.13	3.437	2.937	0.31	0.25	0.25	0.50	0.25	0.25	0.31	0.25	0.25
477	47.75	3.437	2.187	0.31	0.25	0.25	0.50	0.25	0.25	0.31	0.25	0.25
533	53.38	3.437	2.187	0.31	0.25	0.25	0.50	0.25	0.25	0.31	0.25	0.25
589	58.94	3.437	2.687	0.31	0.25	0.25	0.50	0.25	0.25	0.31	0.25	0.31

Table 4. Impeller Weights and WR^2 (moment of inertia in lb-ft^2)

SIZE	MBO		MBR		MBW	
	LBS.	LB-FT²	LBS.	LB-FT²	LBS.	LB-FT²
196	19	4	51	17	34	9
224	26	7	66	28	45	16
252	46	14	88	50	65	28
280	58	22	108	76	80	43
308	79	33	138	114	97	63
336	96	47	164	160	117	89
365	111	63	211	239	137	123
421	155	112	305	460	187	218
477	201	182	392	757	241	359
533	260	285	490	1177	308	562
589	320	420	599	1755	427	984

TCF TWIN CITY FAN

Table 5. MBO, MBR, MBW Direct Drive Minimum Horsepower Required to Start

SIZE	RPM	MINIMUM HP		
		MBO	MBR	MBW
196	3550	2	7 1/2	5
224	3550	3	20	7 1/2
252	3550	7 1/2	30	20
280	3550	15	50	25
308	3550	20	75	40
336	3550	30	100	60
365	3550	40	200	100
421	3550	75	300	200
	1750	20	50	30
477	1750	25	100	50
533	1750	40	150	100
589	1750	50	200	125

The MB Series impellers, especially Model MBR, are relatively heavy. For direct drive fans, the starting time may often dictate the motor size. Please select minimum motor HP per the chart at left. In some cases it may be possible to select a smaller motor depending on the motor design – consult factory.

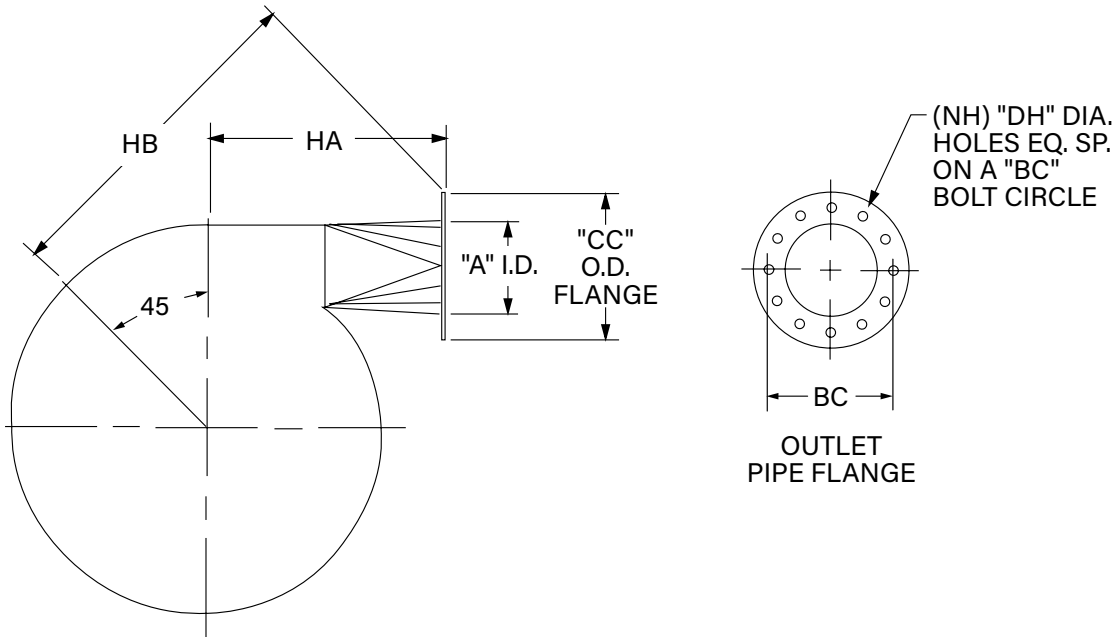
Table 6. Outlet Area (ft^2)

SIZE	STANDARD RECTANGULAR OUTLET	OPTIONAL ROUND OUTLET	OPTIONAL RECTANGULAR EVASE
196	0.14	0.20	0.20
224	0.18	0.35	0.35
252	0.21	0.35	0.35
280	0.25	0.55	0.55
308	0.30	0.55	0.55
336	0.36	0.78	0.78
365	0.42	0.78	0.78
421	0.55	1.07	1.07
477	0.70	1.40	1.40
533	0.86	1.77	1.77
589	1.04	2.18	2.18

Table 7. Bare Fan Weights (lbs.)

SIZE	ARR. 1			ARR. 4			ARR. 8		
	MBO	MBR	MBW	MBO	MBR	MBW	MBO	MBR	MBW
196	307	343	324	255	291	272	388	424	405
224	382	427	403	316	361	337	490	535	511
252	587	636	609	483	532	505	746	795	768
280	762	820	787	630	688	655	991	1049	1016
308	938	1006	959	767	835	788	1278	1346	1299
336	1109	1187	1133	917	995	941	1578	1656	1602
365	1391	1506	1421	1157	1272	1187	2008	2123	2038
421	1856	2029	1893	1463	1636	1500	2697	2870	2734
477	2419	2639	2465	1867	2087	1913	3069	3289	3115
533	2858	3122	2913	2212	2476	2267	3442	3706	3497
589	3650	3970	3773	2753	3073	2876	4487	4807	4610

Optional Round Outlet Expansion & Pipe Flange

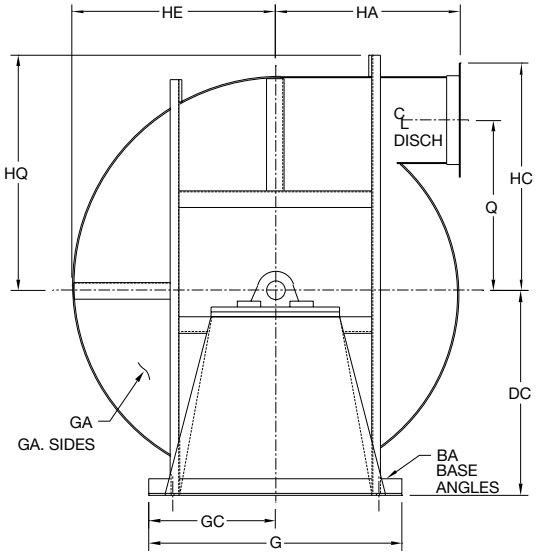


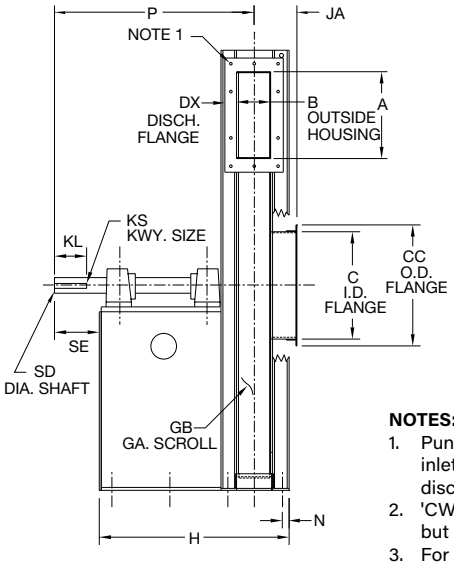
SIZE	A	BC	CC	DH	HA	HB	NH (NO.)	ROUND OUTLET AREA (FT^2)
196	6.00	9.50	11.00	0.44	14.31	22.13	8	0.20
224	8.00	11.75	13.50	0.44	20.50	28.50	8	0.35
252	8.00	11.75	13.50	0.44	19.69	29.13	8	0.35
280	10.00	14.25	16.00	0.44	26.56	36.06	12	0.55
308	10.00	14.25	16.00	0.44	25.50	36.44	12	0.55
336	12.00	17.00	19.00	0.56	32.06	43.25	12	0.78
365	12.00	17.00	19.00	0.56	30.69	43.44	12	0.78
421	14.00	18.75	21.00	0.56	36.06	50.31	12	1.07
477	16.00	21.25	23.50	0.56	41.13	57.13	16	1.40
533	18.00	22.75	25.00	0.56	46.50	63.75	16	1.77
589	20.00	25.00	27.50	0.56	51.63	70.56	20	2.18

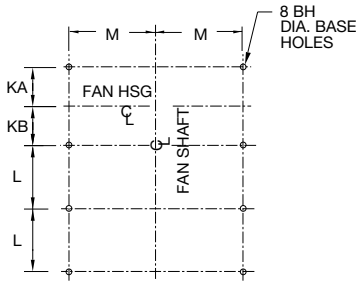
NOTE: Dimensions in inches unless otherwise indicated.

TCF
TWIN CITY FAN

Arrangement 1







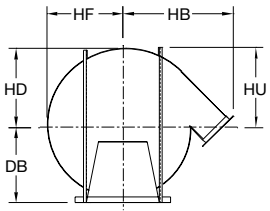
FOUNDATION PLAN

CLOCKWISE ROTATION, TOP HORIZONTAL DISCHARGE 'CW THD'

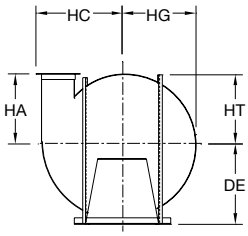
NOTES:

1. Punched outlet flanges per AC15865 & punched inlet flanges per AC15856 are included on all discharges.
2. 'CW' rotation is shown. 'CCW' rotation is similar but opposite.
3. For round outlet (built-in evasé) dimensions see page 19 or drawing AC15949.

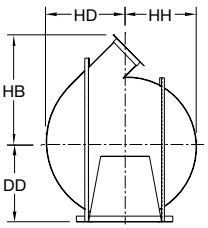
*4. Centerline height = 'DG' + 'DT' when evase, round outlet is used on BHD.



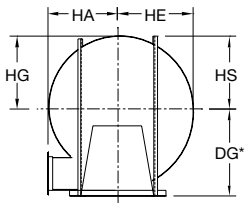
CW TAD



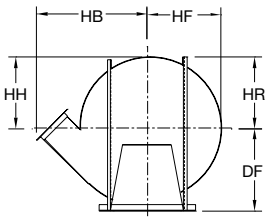
CW UBD



CW TAU



CW BHD



CW BAU

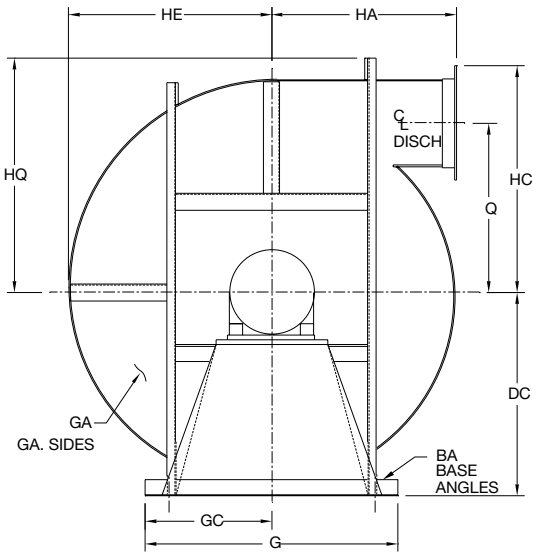
SIZE	A	B	BA	BH	C	CC	DB	DC	DD	DE	DF	DG*	DT*	DX	G	GA	GB	GC	H	HA	HB	HC
196	6.06	3.44	2.00 x 2.00	0.69	7.13	9.38	14.31	14.44	14.75	15.06	15.44	16.50	2.44	1.50	20.50	7	7	10.25	23.31	14.63	21.63	16.00
224	6.88	3.69	2.00 x 2.00	0.69	8.13	10.38	16.06	16.19	16.63	17.00	17.38	18.50	3.31	1.50	22.50	7	7	11.25	23.81	16.00	24.06	18.00
252	7.69	3.94	3 x 3	0.81	9.13	11.63	18.69	19.13	19.56	20.00	20.44	21.56	1.94	1.50	26.88	7	7	13.44	26.06	18.69	27.44	20.06
280	8.63	4.25	3 x 3	0.81	10.13	12.63	20.50	21.00	21.44	21.94	22.44	23.69	1.19	1.50	28.88	0.25	0.25	14.44	26.69	20.13	29.94	22.19
308	9.44	4.63	3 x 3	0.81	11.13	13.63	22.38	22.88	23.38	23.94	25.50	25.75	2.25	1.50	30.38	0.25	0.25	15.44	27.75	21.56	32.38	24.25
336	10.25	5.00	3 x 3	0.81	12.13	15.00	24.13	24.69	25.25	25.88	26.44	27.75	3.38	2.00	35.38	0.25	0.25	17.69	30.13	21.81	34.38	26.75
365	11.06	5.50	3 x 3	0.81	13.13	16.06	25.69	26.31	26.94	27.63	28.25	29.88	2.94	2.00	37.50	0.31	0.25	18.75	31.00	23.56	37.06	28.88
421	12.69	6.25	3 x 3	0.81	15.13	18.06	29.31	30.06	30.75	31.50	32.25	33.94	3.13	2.50	38.88	0.31	0.25	19.44	34.75	27.13	42.81	33.44
477	14.31	7.00	3 x 4	1.06	17.13	20.19	32.94	33.75	34.56	35.38	36.19	38.06	3.56	2.50	45.63	0.31	0.25	22.88	36.50	30.63	48.19	37.50
533	15.94	7.75	3 x 4	1.06	19.13	22.19	36.50	37.44	38.38	39.25	40.19	42.13	3.50	2.50	46.50	0.31	0.25	23.25	37.25	34.19	53.63	41.63
589	17.56	8.50	3.5 x 5	1.06	21.13	24.19	40.63	41.63	42.69	43.69	44.69	46.69	3.44	2.50	49.50	0.31	0.25	24.75	39.00	37.75	59.00	45.69

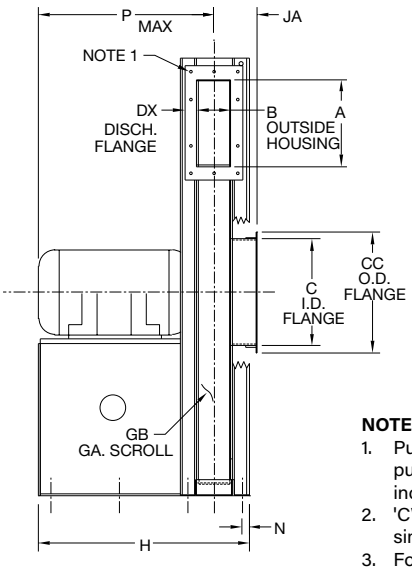
SIZE	HD	HE	HF	HG	HH	HQ	HR	HS	HT	HU	JA	KA	KB	KL	KS	L	M	N	P	Q	SD	SE
196	14.19	13.81	13.50	13.19	12.81	16.50	13.13	13.50	12.69	14.63	4.94	3.00	2.88	4.50	0.38 x 0.19	6.50	8.75	0.88	24.19	11.50	1.687	4.75
224	16.13	15.75	15.38	14.94	14.56	18.50	14.63	15.00	14.13	16.38	5.06	3.13	3.00	4.50	0.50 x 0.25	6.63	9.75	0.88	24.56	13.13	1.937	4.75
252	18.19	17.75	17.31	16.88	16.44	21.56	17.44	17.88	16.88	19.38	6.19	3.75	3.63	4.50	0.50 x 0.25	7.38	10.50	1.38	25.69	14.75	1.937	4.75
280	20.19	19.69	19.25	18.75	18.25	23.69	19.00	19.50	18.38	21.19	6.38	4.00	3.75	4.50	0.50 x 0.25	7.50	11.50	1.38	26.06	16.38	2.187	4.75
308	22.25	21.69	21.19	20.63	20.13	25.75	20.56	21.13	19.94	22.94	6.56	4.19	3.94	6.00	0.50 x 0.25	7.50	12.50	1.38	28.38	18.00	2.187	6.19
336	24.19	23.63	23.06	22.44	21.88	27.75	21.31	22.00	20.63	24.06	6.75	4.38	4.13	6.00	0.50 x 0.25	8.50	14.75	1.38	30.56	19.63	2.187	6.19
365	26.25	25.63	24.94	24.31	23.69	29.88	22.88	23.56	22.06	25.81	7.06	4.69	4.38	6.00	0.63 x 0.31	8.50	15.81	1.38	31.25	21.31	2.437	6.31
421	30.25	29.50	28.75	28.06	27.31	33.94	26.75	27.50	25.88	30.06	7.44	5.06	4.75	6.00	0.88 x 0.44	9.75	16.50	1.38	34.69	24.63	3.437	6.38
477	34.19	33.38	32.56	31.75	30.94	39.06	30.75	31.63	29.69	34.50	8.81	5.94	5.63	6.00	0.88 x 0.44	9.75	19.19	1.88	35.06	27.88	3.437	6.38
533	38.19	37.25	36.38	35.44	34.50	43.13	34.69	35.63	33.56	38.75	9.19	6.31	6.00	6.00	0.88 x 0.44	9.75	19.63	1.88	35.44	31.13	3.437	6.38
589	42.19	41.19	40.19	39.13	38.13	48.19	39.56	40.63	38.38	44.00	10.56	7.19	6.88	6.00	0.88 x 0.44	9.63	20.00	2.38	35.81	34.38	3.437	6.38

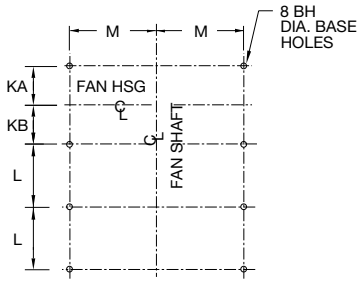
BC15911F

DIMENSIONS ARE SUBJECT TO CHANGE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Arrangement 4







FOUNDATION PLAN

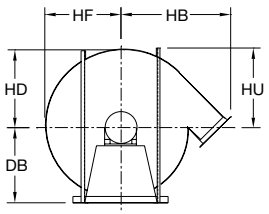
CLOCKWISE ROTATION, TOP HORIZONTAL DISCHARGE 'CW THD'

NOTES:

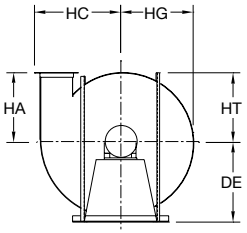
1. Punched outlet flanges per AC15865 & punched inlet flanges per AC15856 are included on all discharges.
2. 'CW' rotation is shown. 'CCW' rotation is similar but opposite.
3. For round outlet (built-in evasé) dimensions see page 19 or drawing AC15949.

*4. Centerline height = 'DG' + 'DT' when evase, round outlet is used on BHD.

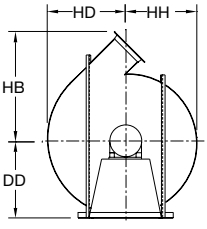
5. Dim. 'FR' is max. motor frame.



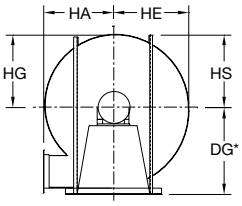
CW TAD



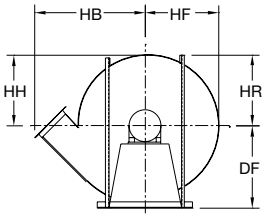
CW UBD



CW TAU



CW BHD



CW BAU

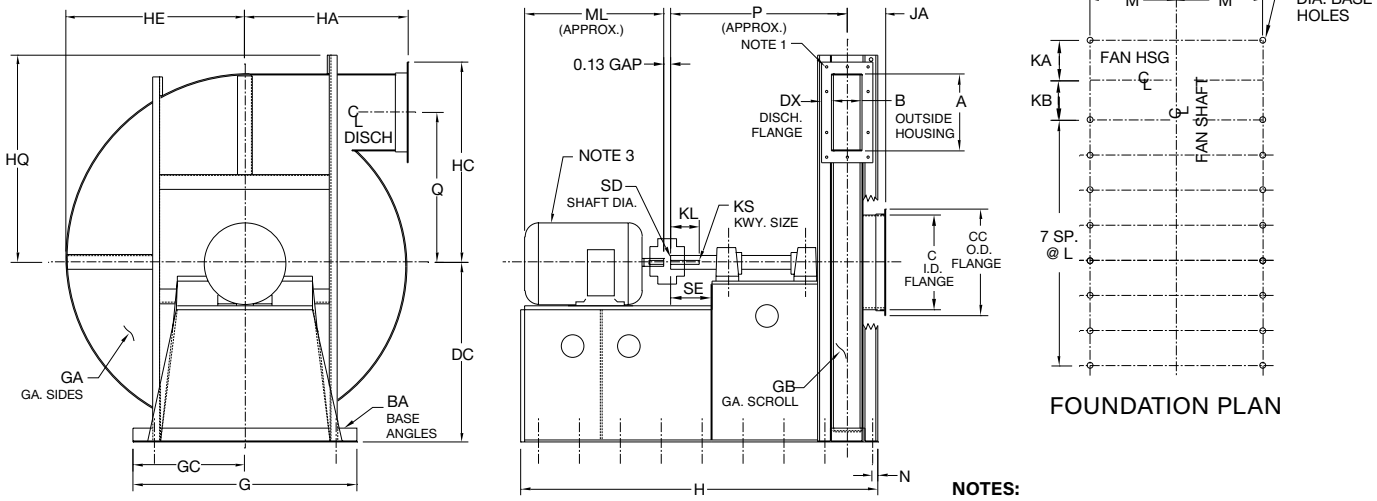
SIZE	A	B	BA	BH	C	CC	DB	DC	DD	DE	DF	DG*	DT*	DX	FR	G	GA	GB	GC	H	HA
196	6.06	3.44	2.00 x 2.00	0.69	7.13	9.38	14.31	14.44	14.75	15.06	15.44	16.50	2.44	1.50	215T	20.50	7	7	10.25	22.63	14.63
224	6.88	3.69	2.00 x 2.00	0.69	8.13	10.38	16.06	16.19	16.63	17.00	17.38	18.50	3.31	1.50	256T	22.50	7	7	11.25	26.88	16.00
252	7.69	3.94	3.00 x 3.00	0.81	9.13	11.63	18.69	19.13	19.56	20.00	20.44	21.56	1.94	1.50	286TS	26.88	7	7	13.44	30.13	18.69
280	8.63	4.25	3.00 x 3.00	0.81	10.13	12.63	20.50	21.00	21.44	21.94	22.44	23.69	1.19	1.50	326TS	28.88	0.25	0.25	14.44	32.50	20.13
308	9.44	4.63	3.00 x 3.00	0.81	11.13	13.63	22.38	22.88	23.38	23.94	25.50	25.75	2.25	1.50	365TS	30.88	0.25	0.25	15.44	35.88	21.56
336	10.25	5.00	3.00 x 3.00	0.81	12.13	15.00	24.13	24.69	25.25	25.88	26.44	27.75	3.38	2.00	445TS	35.38	0.25	0.25	17.69	43.25	21.81
365	11.06	5.50	3.00 x 3.00	0.81	13.13	16.06	25.69	26.31	26.94	27.63	28.25	29.88	2.94	2.00	445TS	37.50	0.31	0.25	18.75	43.81	23.56

SIZE	HB	HC	HD	HE	HF	HG	HH	HQ	HR	HS	HT	HU	JA	KA	KB	L	M	N	P	Q
196	21.63	16.00	14.19	13.81	13.50	13.19	12.81	16.50	13.13	13.50	12.69	14.63	4.94	3.00	2.88	7.00	8.75	0.88	19.88	11.50
224	24.06	18.00	16.13	15.75	15.38	14.94	14.56	18.50	14.63	15.00	14.13	16.38	5.06	3.13	3.00	9.00	9.75	0.88	25.31	13.13
252	27.44	20.06	18.19	17.75	17.31	16.88	16.44	21.56	17.44	17.88	16.88	19.38	6.19	3.75	3.63	9.75	10.50	1.38	27.75	14.75
280	29.94	22.19	20.19	19.69	19.25	18.75	18.25	23.69	19.00	19.50	18.38	21.19	6.38	4.00	3.75	10.75	11.50	1.38	30.19	16.38
308	32.38	24.25	22.25	21.69	21.19	20.63	20.13	25.75	20.56	21.13	19.94	22.94	6.56	4.19	3.94	12.25	12.50	1.38	31.69	18.00
336	34.38	26.75	24.19	23.63	23.06	22.44	21.88	27.75	21.31	22.00	20.63	24.06	6.75	4.38	4.13	15.75	14.75	1.38	44.69	19.63
365	37.06	28.88	26.25	25.63	24.94	24.31	23.69	29.88	22.88	23.56	22.06	25.81	7.06	4.69	4.38	15.75	15.81	1.38	44.69	21.31

BC1004823

DIMENSIONS ARE SUBJECT TO CHANGE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Arrangement 8



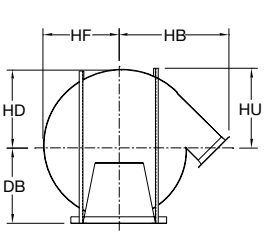
FOUNDATION PLAN

CLOCKWISE ROTATION, TOP HORIZONTAL DISCHARGE 'CW THD'

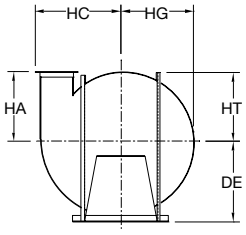
NOTES:

1. Punched outlet flanges per AC15865 & punched inlet flanges per AC15856 are included on all discharges.
2. 'CW' rotation is shown. 'CCW' rotation is similar but opposite.
3. Dim 'FR' equals max. motor size.
4. Use TS frame when possible.
5. For round outlet (built-in evasé) dimensions see page 19 or drawing AC15949.

*6. Centerline height = 'DG' + 'DT' when evase, round outlet is used on BHD.



CW TAD



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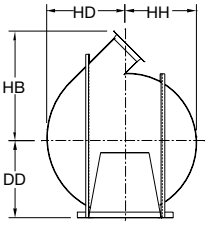

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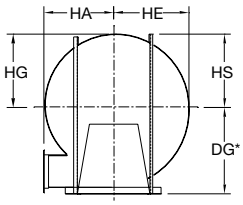

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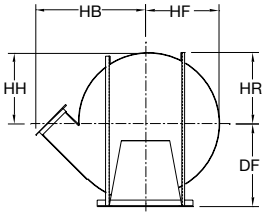


CW BAU

SIZE	A	B	BA	BH	C	CC	DB	DC	DD	DE	DF	DG*	DT*	DX	FR	G	GA	GB	GC	H	HA	HB	HC
196	6.06	3.44	2.00 x 2.00	0.81	7.13	9.38	14.31	14.44	14.75	15.06	15.44	16.50	2.44	1.50	215T	20.50	7	7	10.25	45.69	14.63	21.63	16.00
224	6.88	3.69	2.00 x 2.00	0.81	8.13	10.38	16.06	16.19	16.63	17.00	17.38	18.50	3.31	1.50	256T	22.50	7	7	11.25	50.31	16.00	24.06	18.00
252	7.69	3.94	3.00 x 3.00	0.81	9.13	11.63	18.69	19.13	19.56	20.00	20.44	21.56	1.94	1.50	286TS	26.88	7	7	13.44	54.69	18.69	27.44	20.06
280	8.63	4.25	3.00 x 3.00	0.81	10.13	12.63	20.50	21.00	21.44	21.94	22.44	23.69	1.19	1.50	326TS	28.88	0.25	0.25	14.44	57.63	20.13	29.94	22.19
308	9.44	4.63	3.00 x 3.00	0.81	11.13	13.63	22.38	22.88	23.38	23.94	25.50	25.75	2.25	1.50	365TS	30.88	0.25	0.25	15.44	61.06	21.56	32.38	24.25
336	10.25	5.00	3.00 x 3.00	0.81	12.13	15.00	24.13	24.69	25.25	25.88	26.44	27.75	3.38	2.00	444TS	35.38	0.25	0.25	17.69	72.06	21.81	34.38	26.75
365	11.06	5.50	3.00 x 3.00	0.81	13.13	16.06	25.69	26.31	26.94	27.63	28.25	29.88	2.94	2.00	447TS	37.50	0.31	0.25	18.75	84.44	23.56	37.06	28.88
421	12.69	6.25	3.00 x 3.00	0.81	15.13	18.06	29.31	30.06	30.75	31.50	32.25	33.94	3.13	2.50	449TS	38.88	0.31	0.25	19.44	88.75	27.13	42.81	33.44
477	14.31	7.00	3.00 x 4.00	1.06	17.13	20.19	32.94	33.75	34.56	35.38	36.19	38.06	3.56	2.50	365T	45.63	0.31	0.25	22.81	65.63	30.63	48.19	37.50
533	15.94	7.75	3.00 x 4.00	1.06	19.13	22.19	36.50	37.44	38.38	39.25	40.19	42.13	3.50	2.50	445T	46.50	0.31	0.25	23.25	75.88	34.19	53.63	41.63
589	17.56	8.50	3.50 x 5.00	1.06	21.13	24.19	40.63	41.63	42.69	43.69	44.69	46.69	3.44	2.50	449T	49.50	0.31	0.25	24.75	91.38	37.75	59.00	45.69

SIZE	HD	HE	HF	HG	HH	HQ	HR	HS	HT	HU	JA	KA	KB	KL	KS	L	M	ML	N	P	Q	SD	SE
196	14.19	13.81	13.50	13.19	12.81	16.50	13.13	13.50	12.69	14.63	4.94	3.00	2.88	4.50	0.38 x 0.19	5.31	8.75	20.25	0.88	23.81	11.50	1.437	4.75
224	16.13	15.75	15.38	14.94	14.56	18.50	14.63	15.00	14.13	16.38	5.06	3.13	3.00	4.50	0.38 x 0.19	5.94	9.75	25.75	0.88	23.94	13.13	1.437	4.75
252	18.19	17.75	17.31	16.88	16.44	21.56	17.44	17.88	16.88	19.38	6.19	3.75	3.63	4.50	0.38 x 0.19	6.31	10.50	28.88	1.38	25.06	14.75	1.437	4.75
280	20.19	19.69	19.25	18.75	18.25	23.69	19.00	19.50	18.38	21.19	6.38	4.00	3.75	4.50	0.38 x 0.19	6.69	11.50	32.00	1.38	25.56	16.38	1.687	4.69
308	22.25	21.69	21.19	20.63	20.13	25.75	20.56	21.13	19.94	22.94	6.56	4.19	3.94	6.00	0.38 x 0.19	7.13	12.50	34.38	1.38	27.25	18.00	1.687	6.13
336	24.19	23.63	23.06	22.44	21.88	27.75	21.31	22.00	20.63	24.06	6.75	4.38	4.13	6.00	0.50 x 0.25	8.63	14.75	49.00	1.38	28.56	19.63	2.187	6.13
365	26.25	25.63	24.94	24.31	23.69	29.88	22.88	23.56	22.06	25.81	7.06	4.69	4.38	6.00	0.63 x 0.31	10.31	15.81	54.50	1.38	30.63	21.31	2.437	6.31
421	30.25	29.50	28.75	28.06	27.31	33.94	26.75	27.51	25.88	30.06	7.44	5.06	4.75	6.00	0.75 x 0.38	10.88	16.50	54.50	1.38	34.44	24.63	2.937	6.25
477	34.19	33.38	32.56	31.75	30.94	39.06	30.75	31.63	29.69	34.50	8.81	5.94	5.63	6.00	0.50 x 0.25	7.25	19.19	34.38	1.88	29.56	27.88	2.187	6.13
533	38.19	37.25	36.38	35.44	34.50	43.13	34.69	35.63	33.56	38.75	9.19	6.31	6.00	6.00	0.50 x 0.25	8.56	19.63	49.00	1.88	29.94	31.13	2.187	6.13
589	42.19	41.19	40.19	39.13	38.13	48.19	39.56	40.63	38.38	44.00	10.56	7.19	6.88	6.00	0.63 x 0.31	10.50	20.00	54.50	2.38	34.06	34.38	2.687	6.31

BC15912E

DIMENSIONS ARE SUBJECT TO CHANGE. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Model

MBO

Furnish and install Model MBO Heavy-Duty Pressure Blowers as manufactured by Twin City Fan & Blower, Minneapolis, Minnesota. Fans shall be specifically designed to handle specified volume and pressure to ensure rated performance.

HOUSING — Housings shall be made of a heavy-gauge steel with continuously-welded construction and braced with structural shapes to eliminate any resonant vibration and provide smooth operation. Housings shall be a minimum of 7 gauge thick for impeller diameters to 27". All others shall be a minimum of 1/4" thick. A shaft seal as well as a flanged inlet and outlet shall be provided as standard equipment.

IMPELLER — Impellers shall be of heavy-gauge welded construction. Blades shall be a minimum 1/4" thick for impeller diameter 27" and larger. The impellers shall be mounted to the shaft using an interference fit. The MBO impeller shall be designed to handle hot, sticky and abrasive airstreams as well as clean air applications.

SHAFT — Shafts are to be solid material selected for AISI 1040 or 1045 hot rolled steel, accurately turned, ground, polished and ring-gauged for accuracy. Shaft design shall be of sufficient diameter to allow the first critical speed to be at least 1.35 times the maximum fan operating speed.

BEARINGS — Fans shall be supplied with heavy-duty self-aligning grease lubricated anti-friction ball bearings to provide long bearing life. Bearing support members shall be fabricated of heavy steel shapes to insure maximum rigidity.

FACTORY TEST RUN UNITS — All fans up to 200 HP shall be completely assembled and test run as a unit at operating speed at the factory. The fans are to be balanced and records maintained of the readings in the axial, vertical and horizontal direction on each of the bearings. A written copy of this record shall be available upon request by the customer. Fans larger than 200 HP shall be assembled at the factory and should be field checked for vibration by the customer.

TCF
TWIN CITY FAN

Model

MBR

Furnish and install Model MBR Heavy-Duty Pressure Blowers as manufactured by Twin City Fan & Blower, Minneapolis, Minnesota. Fans shall be specifically designed to handle specified volume and pressure to ensure rated performance.

HOUSING — Housings shall be made of a heavy-gauge steel with continuously-welded construction and braced with structural shapes to eliminate any resonant vibration and provide smooth operation. Housings shall be a minimum of 7 gauge thick for impeller diameters to 27". All others shall be a minimum of 1/4" thick. A shaft seal as well as a flanged inlet and outlet shall be provided as standard equipment.

IMPELLER — Impellers shall be of heavy-gauge welded construction. Blades shall be a minimum 1/4" thick for impeller diameter 27" and larger. The impellers shall be mounted to the shaft using an interference fit. The MBR impeller shall be designed to handle hot, sticky and abrasive airstreams as well as clean air applications, and where efficiency is of paramount importance.

SHAFT — Shafts are to be solid material selected for AISI 1040 or 1045 hot rolled steel, accurately turned, ground, polished and ring-gauged for accuracy. Shaft design shall be of sufficient diameter to allow the first critical speed to be at least 1.35 times the maximum fan operating speed.

BEARINGS — Fans shall be supplied with heavy-duty self-aligning grease lubricated anti-friction ball bearings to provide long bearing life. Bearing support members shall be fabricated of heavy steel shapes to insure maximum rigidity.

FACTORY TEST RUN UNITS — All fans up to 200 HP shall be completely assembled and test run as a unit at operating speed at the factory. The fans are to be balanced and records maintained of the readings in the axial, vertical and horizontal direction on each of the bearings. A written copy of this record shall be available upon request by the customer. Fans larger than 200 HP shall be assembled at the factory and should be field checked for vibration by the customer.

TCF
TWIN CITY FAN

Model

MBW

Furnish and install Model MBW Heavy-Duty Pressure Blowers as manufactured by Twin City Fan & Blower, Minneapolis, Minnesota. Fans shall be specifically designed to handle specified volume and pressure to ensure rated performance.

HOUSING — Housings shall be made of a heavy-gauge steel with continuously-welded construction and braced with structural shapes to eliminate any resonant vibration and provide smooth operation. Housings shall be a minimum of 7 gauge thick for impeller diameters to 27". All others shall be a minimum of 1/4" thick. A shaft seal as well as a flanged inlet and outlet shall be provided as standard equipment.

IMPELLER — Impellers shall be of heavy-gauge welded construction. Blades shall be a minimum 1/4" thick for impeller diameter 27" and larger. The impellers shall be mounted to the shaft using an interference fit. The MBW impeller shall be designed to handle long, stringy or fibrous materials.

SHAFT — Shafts are to be solid material selected for AISI 1040 or 1045 hot rolled steel, accurately turned, ground, polished and ring-gauged for accuracy. Shaft design shall be of sufficient diameter to allow the first critical speed to be at least 1.35 times the maximum fan operating speed.

BEARINGS — Fans shall be supplied with heavy-duty self-aligning grease lubricated anti-friction ball bearings to provide long bearing life. Bearing support members shall be fabricated of heavy steel shapes to insure maximum rigidity.

FACTORY TEST RUN UNITS — All fans up to 200 HP shall be completely assembled and test run as a unit at operating speed at the factory. The fans are to be balanced and records maintained of the readings in the axial, vertical and horizontal direction on each of the bearings. A written copy of this record shall be available upon request by the customer. Fans larger than 200 HP shall be assembled at the factory and should be field checked for vibration by the customer.

TCF
TWIN CITY FAN

ALTERNATIVE PRESSURE BLOWERS

Models
TBNA | TBNS

Sizes
14.5" to 38" inches impeller diameters

Performance
Airflow to 20,000 CFM
Static pressure to 128 inches w.g.

See Catalog 1250 for more information

TBNA
Aluminum Impeller

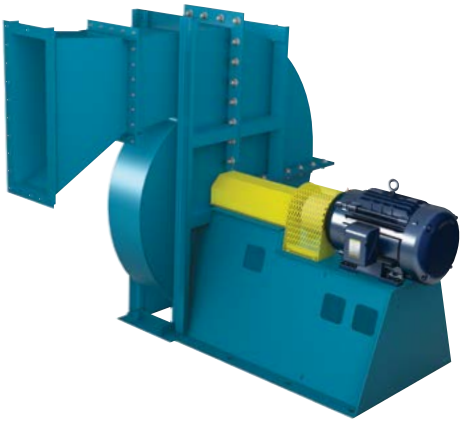
TBNS
Steel Impeller

Model
BCN

Sizes
27" to 73" impeller diameters

Performance
Airflow to 75,000 CFM
Static pressures to 100" w.g.

See Catalog 1450 for more information

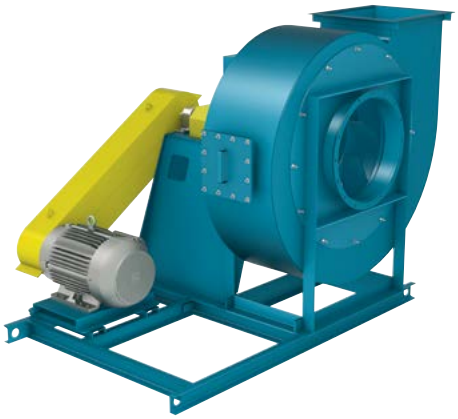


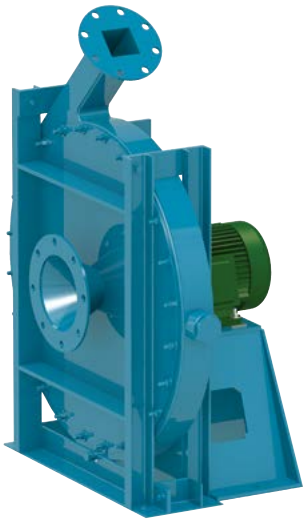
Radial Bladed Fans
RB Series (For Lower Pressure Material Handling)

Sizes
8.75" to 104.25" impeller diameters

Performance
Airflow to 141,000 CFM
Static pressures to 32" w.g.

See Catalog 902 for more information





HRO Impeller

HRS Impeller

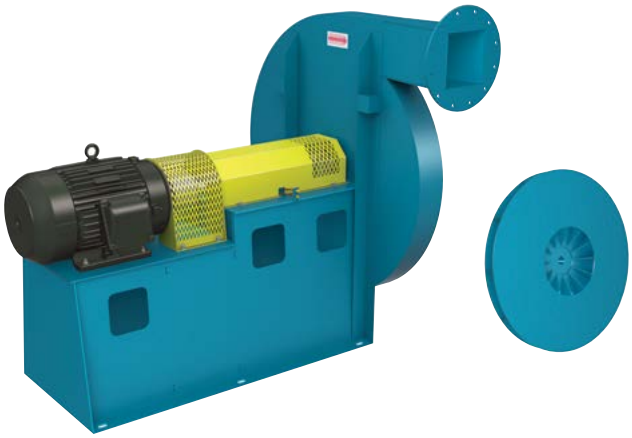
Models

HRO | HRS

Sizes
19.75" to 61.25" impeller diameters

Performance
Airflow to 10,000 CFM
Static pressures up to 120" w.g.

See Catalog 1300 for more information



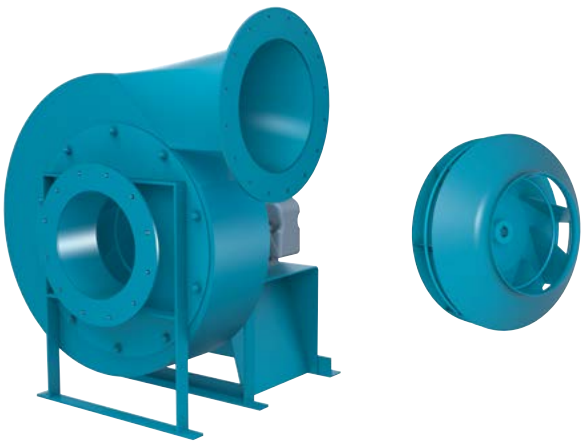
Model

TBR

Sizes
10.75" to 35.19" impeller diameters

Performance
Airflow to 10,100 CFM
Static pressures to 104" w.g.

See Catalog 1200 for more information



Model

TBA

Sizes
11.19" to 32.06" impeller diameters

Performance
Airflow to 28,700 CFM
Static pressures to 70" w.g.

See Catalog 1200 for more information

INDUSTRIAL PROCESS AND COMMERCIAL VENTILATION SYSTEMS

CENTRIFUGAL FANS | UTILITY SETS | PLENUM & PLUG FANS | INLINE CENTRIFUGAL FANS
MIXED FLOW FANS | TUBEAXIAL & VANEAXIAL FANS | WALL MOUNTED FANS | ROOF VENTILATORS
CENTRIFUGAL ROOF & WALL EXHAUSTERS | CEILING VENTILATORS | GRAVITY VENTILATORS | DUCT BLOWERS
RADIAL BLADED FANS | RADIAL TIP FANS | HIGH EFFICIENCY INDUSTRIAL FANS | PRESSURE BLOWERS
LABORATORY EXHAUST FANS | FILTERED SUPPLY FANS | MANCOOLERS | FIBERGLASS FANS | CUSTOM FANS

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