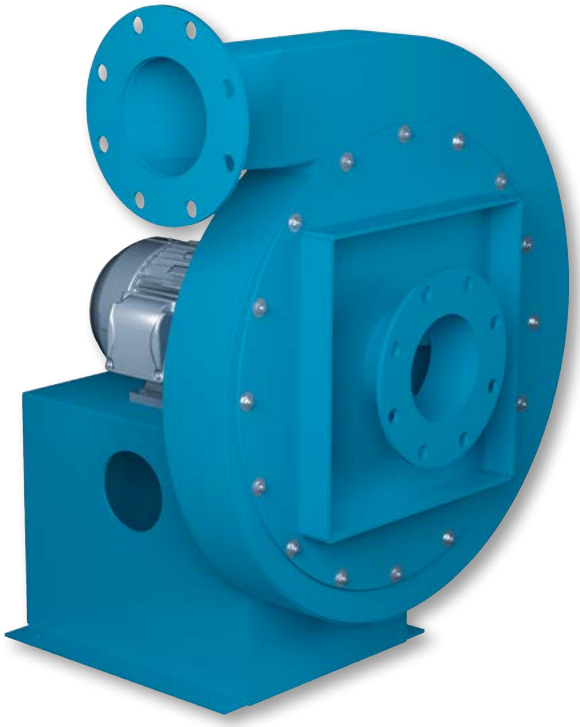
TCF

TWIN CITY FAN

INDUSTRIAL PROCESS AND
COMMERCIAL VENTILATION SYSTEMS

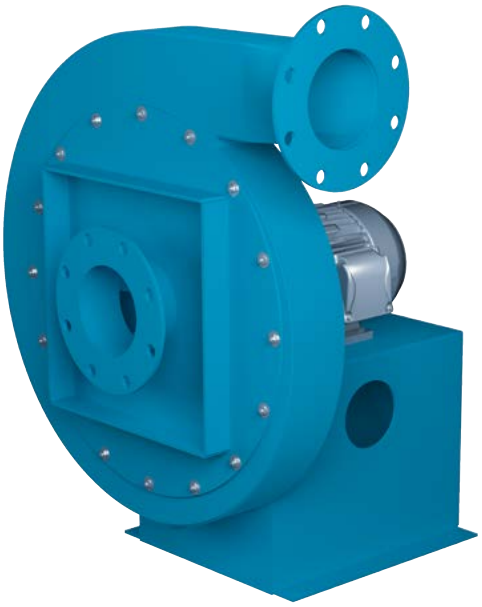
PRESSURE BLOWERS

Model PBW



Overview

Model PBW



Arrangement 4 with Punched Outlet Flange

The Model PBW is designed for low flow and high static pressures, yet stable operation throughout its operating range. The PBW is ideal for the handling of long, stringy, or fibrous materials.

Typical Applications

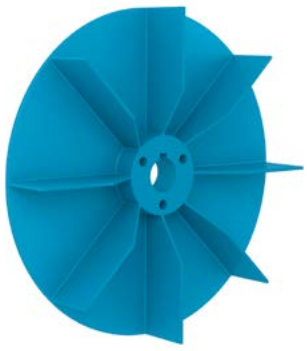
- Textile fiber stripping
- Material conveying
- Product drying
- Air pollution control
- High pressure industrial-process systems
- Glass blowing
- Combustion air
- Fluid bed aeration
- Scrubber exhaust
- Gas boosting

Capabilities

- Static pressures to 60" w.g.
- Airflow capabilities to 7,700 CFM
- High temperature applications to 400°F

Housing Construction

Fans come standard with heavy-gauge, continuously-welded steel housings and welded pedestals for rugged, heavy-duty, long-term service. Housings are reversible and rotatable in the field for easy retrofit and new applications. Fans come standard with a punched inlet flange, round punched flanged outlet connection and standard shaft seal.



PBW Impeller

Impeller

The Model PBW offers an all-welded, reversible, radial back plate impeller of constructed in Corten steel. PBW impellers are ideal for material handling applications.

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.

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TWIN CITY FAN

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

Arrangement 1 (Belt Driven)
The fan impeller on an Arrangement 1 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.

Arrangement 4 (Direct Drive)
The fan impeller on an Arrangement 4 is mounted directly on the motor shaft with the motor mounted on a pedestal. An Arrangement 4 offers a compact, low maintenance design, as there are no fan bearings, fan shaft or drive parts to maintain. Arrangement 4 fans are limited to 180°F.

Arrangement 8 (Direct Drive)
Arrangement 8 is a modified version of Arrangement 1 used for direct drive. The Arrangement 1 bearing pedestal is extended to accommodate the motor. A flexible coupling connects the fan and motor shaft. Consult factory for more information.

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

Arrangement 1

Arrangement 4

Arrangement 8

Arrangement 9

Optional Construction

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 99-0401-86. 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.

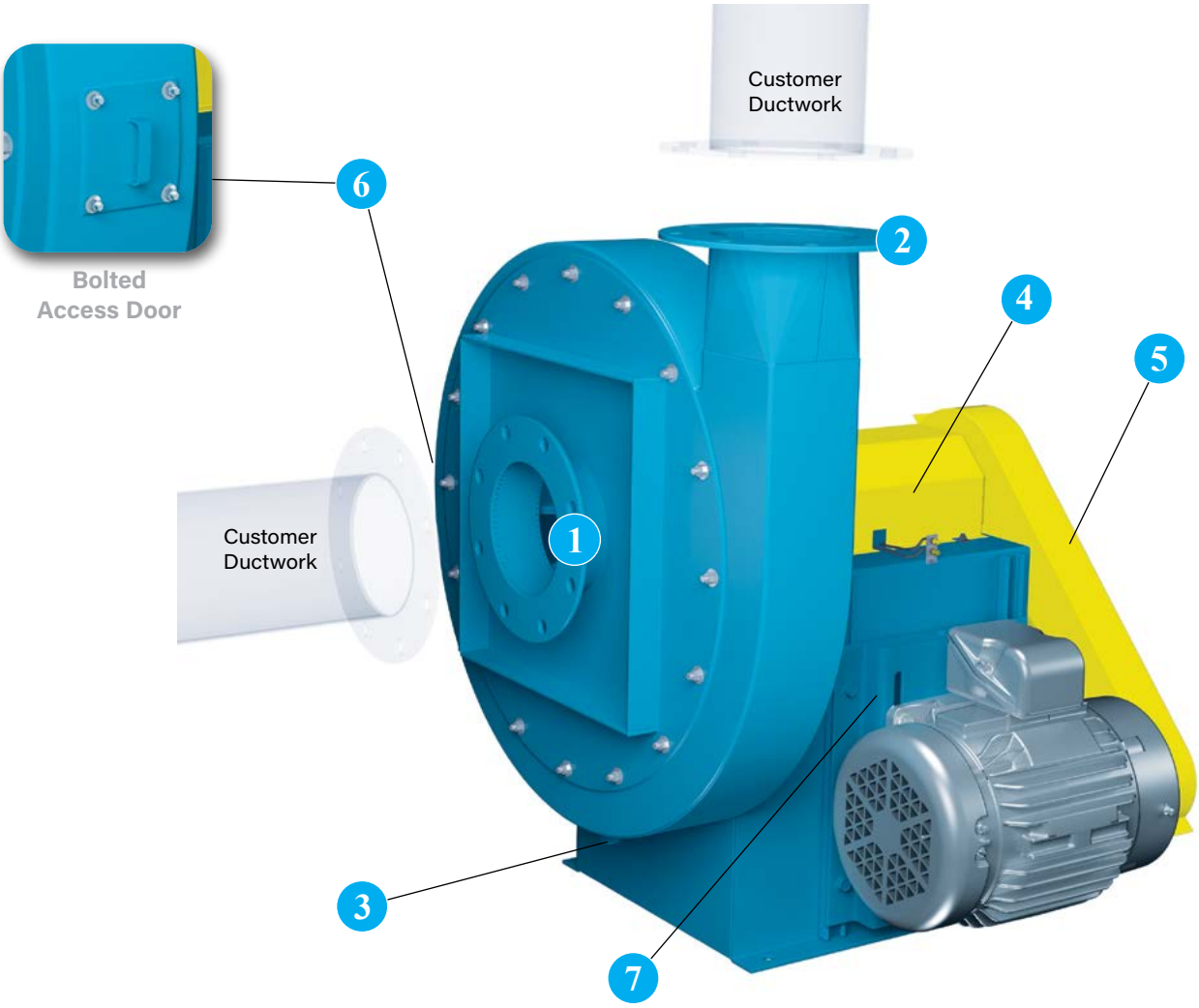
Type B - The fan shall have a nonferrous impeller and nonferrous rub ring about the opening through which the shaft passes — usually aluminum impeller and rub ring and limited to 200°F. Consult factory for availability.

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

High Temperature Construction
301° to 400°F - Package includes shaft cooler with guard, high temperature grease and standard enamel paint. For Arrangement 9 fans, a motor heat shield is included.

Shaft Cooler & Safety Guard

OPTIONS/ACCESSORIES



1 **Flanged Inlet** Punched to ANSI 125/150 hole pattern for bolted connection is standard.

2 **Flanged Outlet** Punched to ANSI 125/150 hole pattern for bolted connection is standard.

3 **Drain** Standard 3/4" NPT half coupling located at the lowest point of the housing. Available with or without plug.

4 **Shaft and Bearing Guard** Sheet metal guards cover shaft and bearings and come with extended lube lines to a common point outside of the guard. Painted safety yellow.

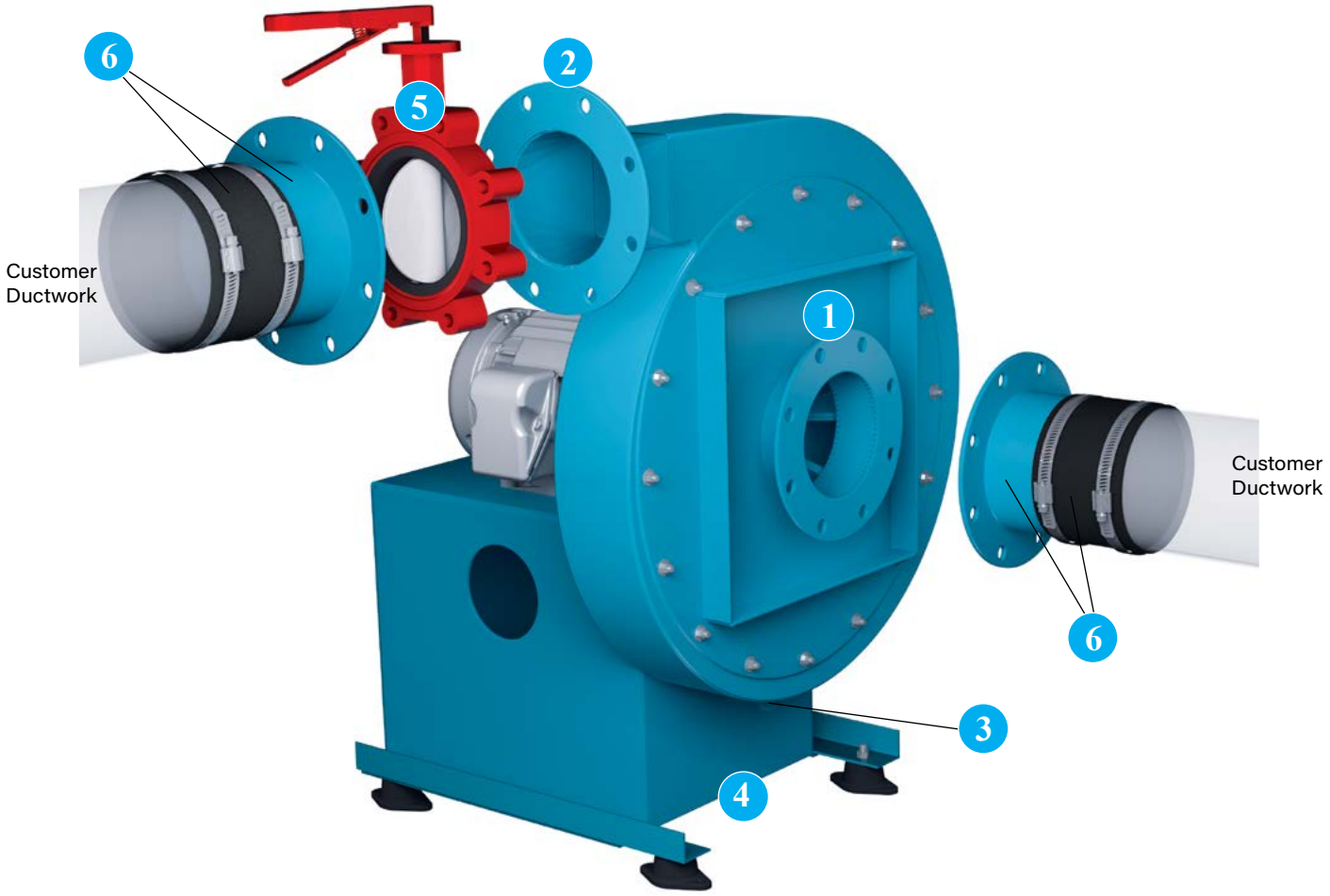
5 **Belt Guard** OSHA style to enclose the V-belt drive. Painted safety yellow.

6 **Access Door** Heavy-duty bolted panel provides access for impeller inspection.

7 **Motor Slide Base** for positioning motors and adjust.

Other Accessories Include:

- Inlet Bell with Inlet Screen
- Belt Guard; Quick Access
- Shaft Guard (Bearings Exposed)
- Extended Lube Lines (Arr. 1, 8, & 9)
- Stainless Steel Nameplate
- Bases (Unitary, Isolation and Inertia)



1 **Flanged Inlet** Punched to ANSI 125/150 hole pattern for bolted connection is standard. Other patterns available upon request.

2 **Flanged Outlet** Punched to ANSI 125/150 hole pattern for bolted connection is standard. Other patterns available upon request.

3 **Drain** Standard $^{3}/_{4}$" NPT half coupling located at the lowest point of the housing. Available with or without plug.

4 **Vibration Rails w/ RIS Isolators** Designed to limit forces transmitted to the support structure of an operating fan. Constructed of structural angle, the rails extend the distance between mounting points distributing a more even load to the isolators. Rubber-in-shear type isolators and flexible connectors at inlet and outlet are often required.

5 **Outlet 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.

6 **Tube-Adapter with Rubber Sleeve & clamps (on inlet & outlet)** Offers flexible connection between the fan and connecting ductwork. Flexible rubber sleeve is good to 200°F operation.

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TWIN CITY FAN

Maximum RPM, Impeller Weights and WR² (moment of inertia in lb-ft²)

FAN SIZE		MAX. RPM	WEIGHT (LB)	WR² (LB-FT²)
HOUSING	IMPLR			
3	19	3600	38.2	9.54
	20	3600	41.2	11.4
	21	3600	44.3	13.6
	22	3600	47.6	16.1
4	19	3600	41.9	10.8
	20	3600	45.1	12.8
	21	3600	48.5	15.2
	22	3600	51.9	17.8
5	21	3600	44.3	13.6
	22	3600	47.6	16.1
	23	3600	52.1	19.3
	26	3600	69.6	32.6
6	21	3600	48.5	15.2
	22	3600	51.9	17.8
	23	3600	57.8	21.5
	26	3600	78.4	36.6

Inlet Suction Pressure Correction

If the inlet pressure is suction or negative, the static pressure required must be corrected by the inlet density ratio.

Example: Operating conditions: 70°F at sea level. System resistance at the inlet of the fan is 40".

The correction factor from the table at right is 0.902, or it can be calculated as follows:

$$(407.5 - 40") \div 407.5 = 0.902$$

Equivalent static pressure to be used for selection from the standard performance curves:

$$40" \div 0.902 = 44.36"$$

Actual air density at the inlet of the fan:

$$0.075 \text{ lb/ft}^3 \times 0.902 = 0.0676 \text{ lb/ft}^3$$

Inlet Suction Pressure Correction Factors

INLET SUCTION PRESSURE (IN. W.G.)	CORRECTION FACTOR
5	0.988
10	0.975
15	0.963
20	0.951
25	0.939
30	0.926
35	0.914
40	0.902
45	0.890
50	0.877
55	0.865

Correction Factor = (407.5 – Inlet Suction Pressure) ÷ 407.5

Shaft & Bearings

FAN SIZE		ARR. 1 & 9	
HOUSING	IMPELLER DIAMETER	SHAFT DIAMETER (IN.)	BEARING TYPE
3	All	1-11/16	HDB
4	All	1-11/16	HDB
5	All	1-15/16	HDB
6	All	1-15/16	HDB

HDB: Heavy-Duty Ball Bearing

Bare Fan Weights (Lbs.)

FAN SIZE		WEIGHT (LBS.)	
HOUSING	IMPELLER DIAMETER	ARR. 1 & 9	ARR. 4
3	19	263	275
3	20	266	278
3	21	270	281
3	22	273	284
4	19	271	283
4	20	275	286
4	21	278	290
4	22	281	293
5	21	376	395
5	22	380	398
5	23	384	402
5	26	402	420
6	21	390	408
6	22	393	412
6	23	399	417
6	26	420	438

Note: Weights provided above are for the largest inlet/outlet size available on the housing.

Housing Thickness

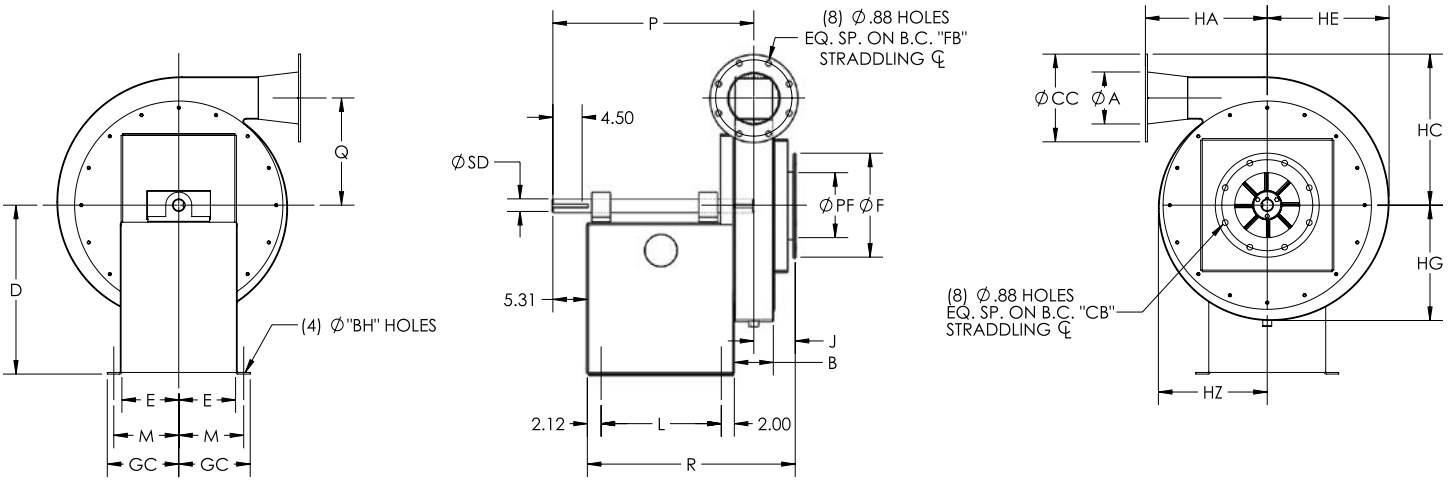
FAN SIZE	HOUSING THICKNESS	
	SIDES	SCROLL
ALL	10 GA.	10 GA.

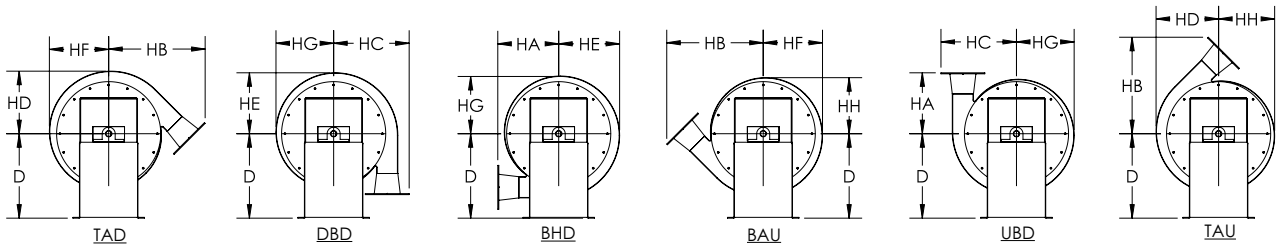
Temperature Derate

AIRSTREAM TEMP (°F)	DERATE FACTOR
70	1.00
200	1.00
300	1.00
400	1.00

TCF TWIN CITY FAN

Arrangement 1





Notes:
1. CW rotation shown, CCW rotation similar but opposite.
2. Optional K & B flange per BC1005899.

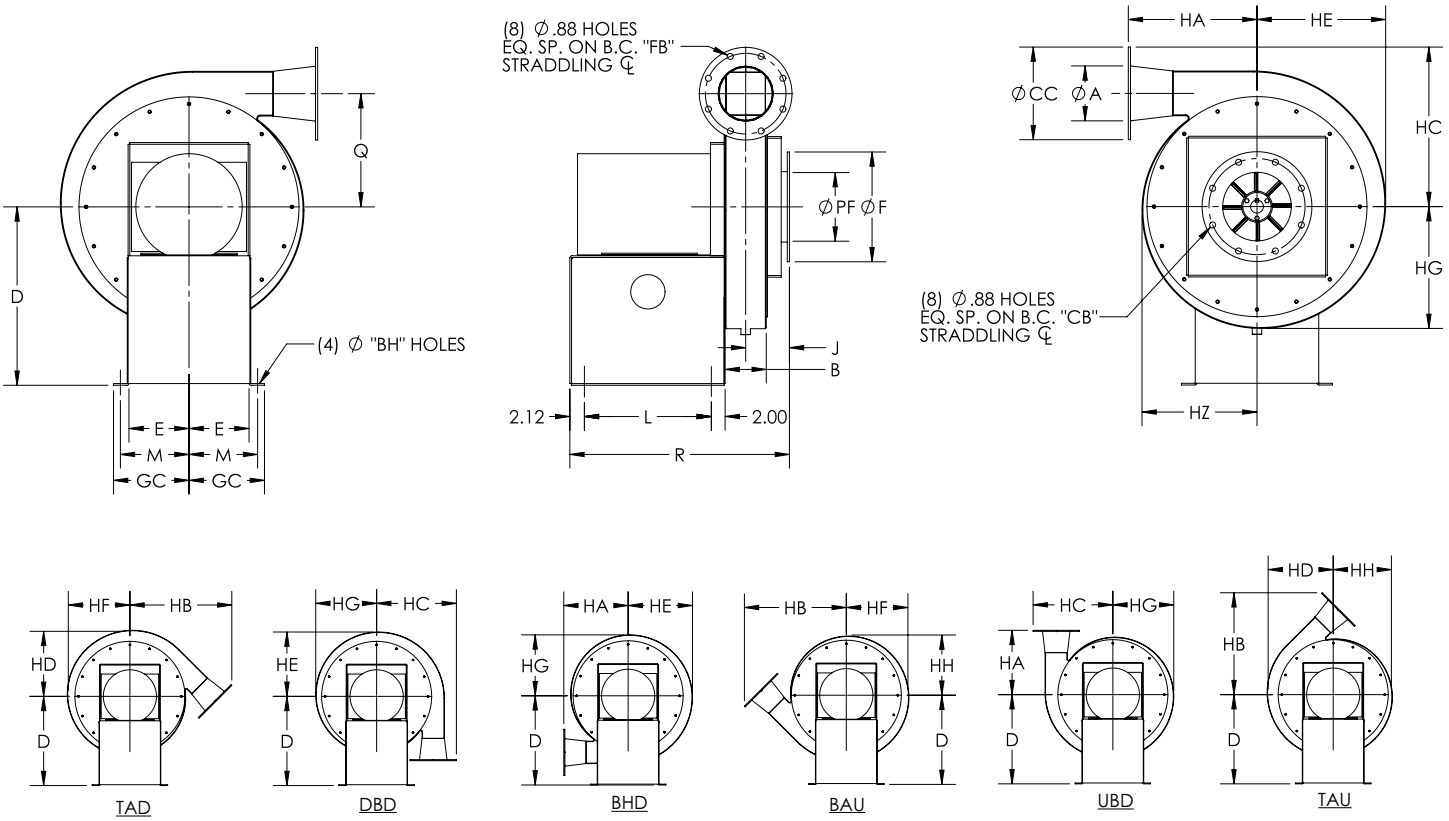
HOUSING SIZE	IMPELLER DIAMETER (NOMINAL)	INLET DIAMETER (NOMINAL)	A	B	BH	CB	CC	D	E	F	FB	GC	HA	HB
3	19, 20, 21, & 22	6	6.00	4.50	0.56	9.50	11.00	20.00	6.81	11.00	9.50	9.00	16.00	25.63
		8				11.75				13.50				
		10				14.00				16.00				
4	19, 20, 21, & 22	6	6.00	5.50	0.56	9.50	11.00	20.00	6.81	11.00	9.50	9.00	16.00	25.63
		8				11.75				13.50				
		10				14.00				16.00				
5	21, 22, 23, & 26	6	6.00	4.75	0.69	9.50	11.00	26.00	8.75	11.00	9.50	11.00	18.75	29.70
		8				11.75				13.50				
		10				14.00				16.00				
6	21, 22, 23, & 26	6	8.00	6.00	0.69	9.50	13.50	26.00	8.75	11.00	11.75	11.00	18.75	29.70
		8				11.75				13.50				
		10				14.00				16.00				

HOUSING SIZE	HC	HD	HE	HF	HG	HH	HZ	J	L	M	P	PF	Q	R	SD	MAX MOTOR FRAME	
																EXCL. TAD & BHD	TAD & BHD
3	20.25	17.13	16.51	15.88	15.26	14.63	13.88	5.63	14.63	8.00	26.31	6.00	14.75	26.63	1.688	286T	145T
												8.00					
												10.00					
4	20.25	17.13	16.51	15.88	15.26	14.63	13.88	6.13	14.63	8.00	26.81	6.00	14.75	27.63	1.688	286T	145T
												8.00					
												10.00					
5	22.00	19.26	18.76	18.26	17.76	17.26	18.63	5.75	18.50	10.00	30.31	6.00	16.50	30.75	1.938	326T	184T
												8.00					
												10.00					
6	23.25	19.26	18.76	18.26	17.76	17.26	18.63	6.38	18.50	10.00	30.93	6.00	16.50	32.00	1.938	326T	184T
												8.00					
												10.00					

BC1006149B

DIMENSIONS ARE NOT TO BE USED FOR CONSTRUCTION. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Arrangement 4



Notes:
1. CW rotation shown, CCW rotation similar but opposite.
2. Optional K & B flange per BC1005899.

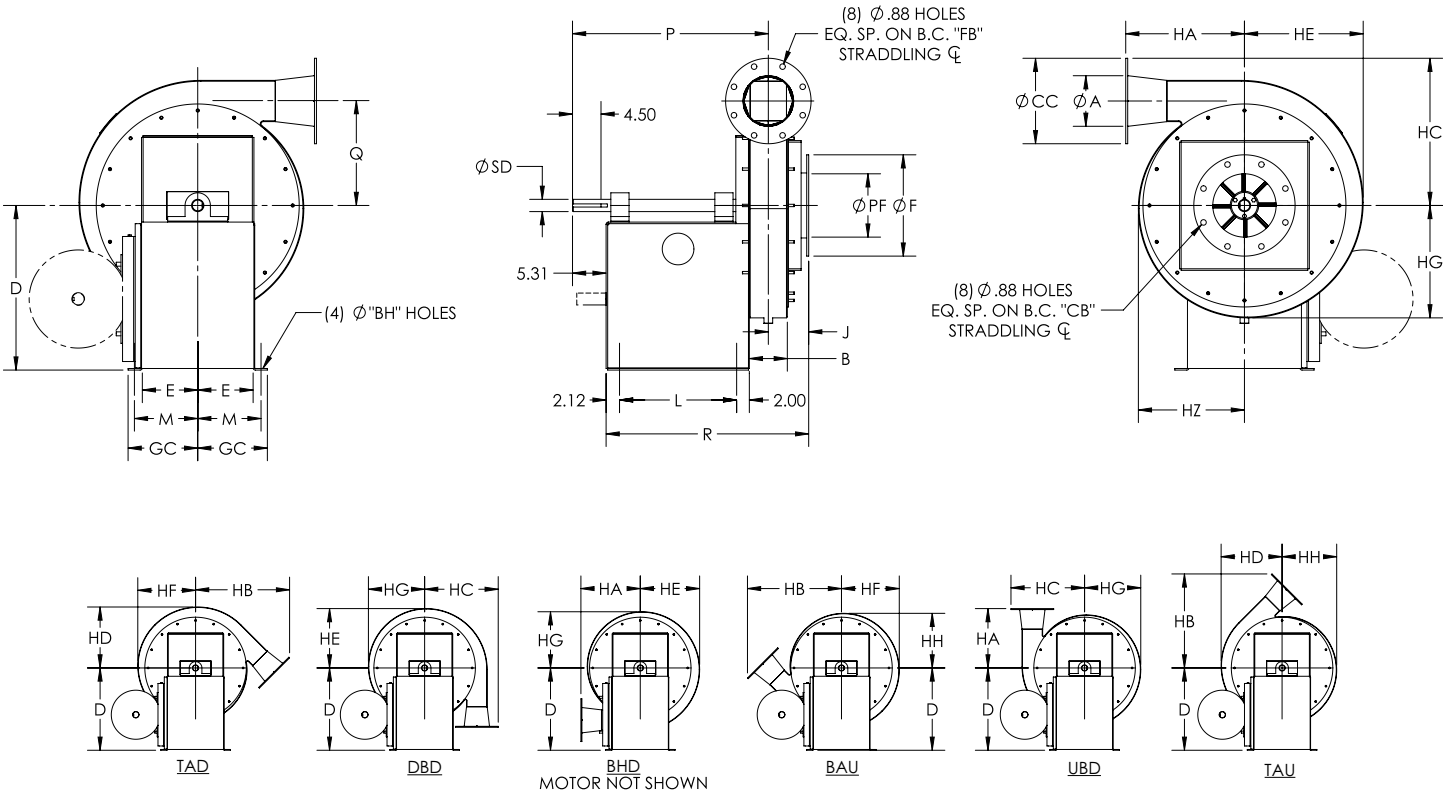
HOUSING SIZE	IMPELLER DIAMETER (NOMINAL)	INLET DIAMETER (NOMINAL)	A	B	BH	CB	CC	D	E	F	FB	GC	HA	HB
3	19, 20, 21 & 22	6	6.00	4.50	0.56	9.50	11.00	20.00	6.81	11.00	9.50	9.00	16.00	25.63
		8				11.75				13.50				
		10				14.00				16.00				
4	19, 20, 21 & 22	6	6.00	5.50	0.56	9.50	11.00	20.00	6.81	11.00	9.50	9.00	16.00	25.63
		8				11.75				13.50				
		10				14.00				16.00				
5	21, 22, 23 & 26	6	6.00	4.75	0.69	9.50	11.00	26.00	8.75	11.00	9.50	11.00	18.75	29.70
		8				11.75				13.50				
		10				14.00				16.00				
6	21, 22, 23 & 26	6	8.00	6.00	0.69	9.50	13.50	26.00	8.75	11.00	11.75	11.00	18.75	29.70
		8				11.75				13.50				
		10				14.00				16.00				

HOUSING SIZE	HC	HD	HE	HF	HG	HH	HZ	J	L	M	PF	Q	R	MAX MOTOR FRAME
3	20.25	17.13	16.51	15.88	15.26	14.63	13.88	5.63	14.63	8.00	6.00	14.75	26.63	286T
											8.00			
											10.00			
4	20.25	17.13	16.51	15.88	15.26	14.63	13.88	6.13	14.63	8.00	6.00	14.75	27.63	286T
											8.00			
											10.00			
5	22.00	19.26	18.76	18.26	17.76	17.26	18.63	5.75	18.50	10.00	6.00	16.50	30.75	326T
											8.00			
											10.00			
6	23.25	19.26	18.76	18.26	17.76	17.26	18.63	6.38	18.50	10.00	6.00	16.50	32.00	326T
											8.00			
											10.00			

BC1006151B

DIMENSIONS ARE NOT TO BE USED FOR CONSTRUCTION. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

Arrangement 9



Notes:
1. CW rotation shown, CCW rotation similar but opposite.
2. Optional K & B flange per BC1005899.
3. Standard Arr. 9 motor location is on the left for CW rotation and on the right for CCW rotation except BHD, which is right for CW and left for CCW.

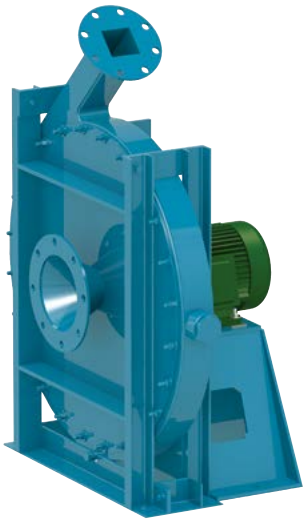
HOUSING SIZE	IMPELLER DIAMETER (NOMINAL)	INLET DIAMETER (NOMINAL)	A	B	BH	CB	CC	D	E	F	FB	GC	HA	HB
3	19, 20, 21 & 22	6	6.00	4.50	0.56	9.50	11.00	20.00	6.81	11.00	9.50	9.00	16.00	25.63
		8				11.75				13.50				
		10				14.00				16.00				
4	19, 20, 21 & 22	6	6.00	5.50	0.56	9.50	11.00	20.00	6.81	11.00	9.50	9.00	16.00	25.63
		8				11.75				13.50				
		10				14.00				16.00				
5	21, 22, 23 & 26	6	6.00	4.75	0.69	9.50	11.00	26.00	8.75	11.00	9.50	11.00	18.75	29.70
		8				11.75				13.50				
		10				14.00				16.00				
6	21, 22, 23 & 26	6	8.00	6.00	0.69	9.50	13.50	26.00	8.75	11.00	11.75	11.00	18.75	29.70
		8				11.75				13.50				
		10				14.00				16.00				

HOUSING SIZE	HC	HD	HE	HF	HG	HH	HZ	J	L	M	P	PF	Q	R	SD	MAX MOTOR FRAME
3	20.25	17.13	16.51	15.88	15.26	14.63	13.88	5.63	14.63	8.00	26.31	6.00	14.75	26.63	1.69	215T
												8.00				
												10.00				
4	20.25	17.13	16.51	15.88	15.26	14.63	13.88	6.13	14.63	8.00	26.81	6.00	14.75	27.63	1.69	215T
												8.00				
												10.00				
5	22.00	19.26	18.76	18.26	17.76	17.26	18.63	5.75	18.50	10.00	30.31	6.00	16.50	30.75	1.94	256T
												8.00				
												10.00				
6	23.25	19.26	18.76	18.26	17.76	17.26	18.63	6.38	18.50	10.00	30.93	6.00	16.50	32.00	1.94	256T
												8.00				
												10.00				

BC1005950A

DIMENSIONS ARE NOT TO BE USED FOR CONSTRUCTION. CERTIFIED DRAWINGS AVAILABLE UPON REQUEST.

ALTERNATIVE PRESSURE BLOWERS



HRO Impeller

HRS Impeller

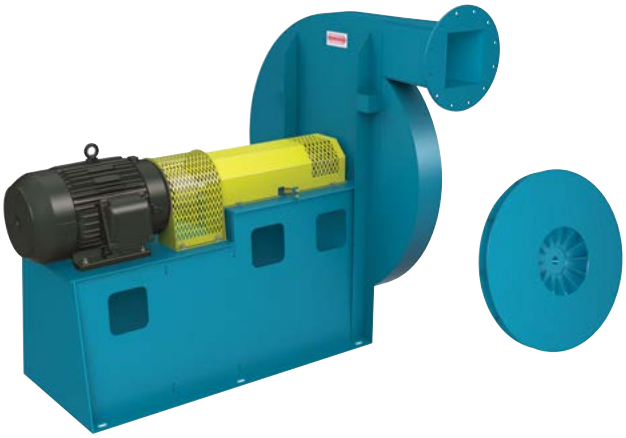
Models

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



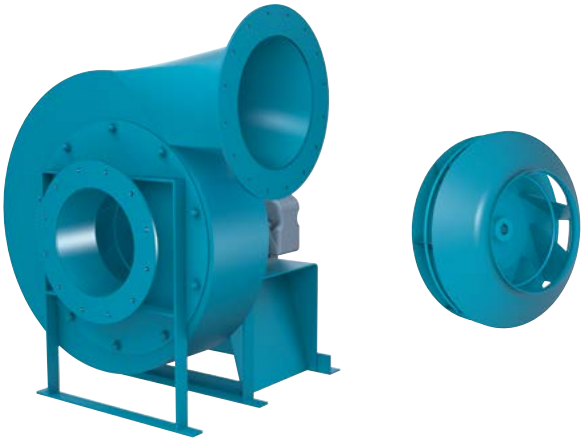
Model

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

Models

MBO | MBR | MBW

Sizes
19.63" to 58.94" impeller diameters

MBO Performance
Airflow to 18,000 CFM
Static pressures over 170" w.g.

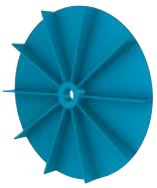
MBR Performance
Airflow to 18,000 CFM
Static pressures over 180" w.g.

MBW Performance
Airflow to 20,000 CFM
Static pressures over 160" w.g.

See Catalog 1400 for more information

MBO Impeller

MBR Impeller



MBW Impeller

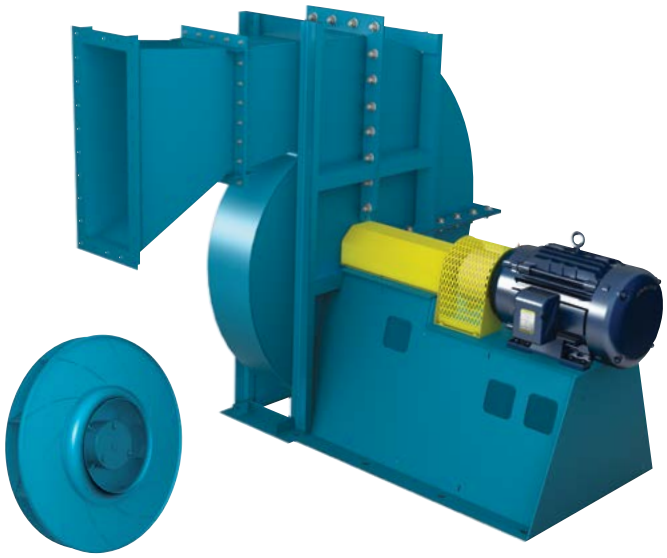
Model

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



Model

PBW

Fans shall be Type PBW Pressure Blowers as manufactured by Twin City Fan & Blower, Minneapolis, Minnesota.

PERFORMANCE — Fans shall be tested in accordance with ANSI/AMCA Standard 210 (air performance) and 300 (sound performance) in an AMCA accredited laboratory.

HOUSING — Fan housings shall be constructed of continuously-welded heavy-gauge steel. All sizes shall be rotatable and reversible. A choice of inlet connections shall include an inlet venturi with screen, an inlet pipe assembly and a punched flange to ANSI 125/150 bolt pattern. The outlet connection shall be flanged and punched to ANSI 125/150 bolt pattern. Inlet and outlet flanges with alternate bolt patterns shall be available.

IMPELLER — Impellers shall be constructed of continuously-welded heavy-gauge steel or from a variety of special materials. Impellers shall be statically and dynamically balanced. The complete fan assembly shall be test balanced at the operating speed prior to shipment.

SHAFT (ARR. 1, 8 & 9 ONLY) — Shafts shall be AISI 1045 hot rolled steel, accurately turned, ground, polished and ring-gauged for accuracy. Shafts shall be sized for the first critical speed of at least 1.43 times the maximum speed.

BEARINGS (ARR 1, 8 & 9 ONLY) — Bearings shall be heavy-duty, grease lubricated, anti-friction ball or roller, self-aligning, pillow block type and selected for a minimum average bearing life (AFBMA L-50) in excess of 200,000 hours at the maximum fan RPM.

FINISH AND 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 inlet filters, inlet filters with hoods, inlet and outlet silencers, flexible connectors for flanged outlet and plain pipe outlets, outlet blast gates, built-in outlet dampers, shaft closure plates, shaft seals, drains, inspection ports, shaft and bearing guards, belt guards, couplings, coupling guards, unitary bases, isolation bases, inertia bases and vibration rails shall be provided by Twin City Fan & Blower to maintain one source responsibility.

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

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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