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**Twin City Fan & Blower Guide Specification
Cast Aluminum Pressure Blowers: Model TPB Series, Belt Driven**

**Twin City Fan & Blower’s Cast Aluminum Pressure** **Blowers** are the perfect choice for providing low volume, high pressure air for cooling, ventilating, and exhaust systems that handle dust, materials, or corrosive fumes. These belt driven blowers feature heavy duty cast aluminum housings with cast aluminum wheels for extra-long life and trouble-free service.

**Application**

Cast aluminum pressure blowers are available in seven housing sizes that can be fitted with multiple wheel and inlet configurations to meet any performance requirement. In the event that performance needs change, a simple change of the wheel and/or inlet can be made. These fans have been air and sound tested in Twin City Fan’s AMCA accredited Test Laboratory.

Sizes (wheel diameter): 8 to 18 inches (203 mm to 457 mm)

Airflow to 2,400 CFM (4,078 m3/hour)

Static pressure to 22 inches wg (5,465 Pa)

TCF is an industry leading designer and manufacturer of high quality commercial and industrial fans and is a division of Twin City Fan Companies, Ltd. Our extensive product line includes centrifugal fans and blowers, axial fans, and power roof ventilators. For the commercial market, TCF supplies ventilation fans for retail and office buildings, restaurants, schools, hospitals, and government buildings. TCF’s industrial fans are used in a wide variety of process applications for numerous industries including Petrochemical, Nuclear, Cement, Steel, and Air Pollution Control. Special materials, construction, coatings, and accessories are available to fit any application requirements.

TCF has completed thousands of successful installations across the globe and has a proven track record for tackling the most technically complex applications within the fan industry. TCF is also known for its technical design capabilities, comprehensive testing services, and responsive sales team. Due to the company’s extensive expertise and long-standing reputation for proven quality, TCF products continue to be specified around the globe.

TCF occupies over 1,000,000 sq. ft. of manufacturing space across ten facilities in the U.S, with expanded manufacturing and service operations located in South America, Europe, India, China, and Singapore. Headquarters are located in Minneapolis, Minnesota, which houses the management, sales and marketing, accounting, human resources, material management, engineering personnel, as well as a state-of-the-art AMCA accredited testing lab.

We recommend you consult with your Twin City Fan & Blower Sales Representative, who can be contacted through: Twin City Fan & Blower, Minneapolis MN; (763) 551-7600; email: tcf\_sales@tcf.com; [www.tcf.com](http://www.tcf.com).

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SECTION 23 34 16 – INDUSTRIAL FANS

1. GENERAL
	* + 1. SUMMARY
				1. Section includes radial blade Industrial blowers, belt driven.
			2. REFERENCE STANDARDS
				1. American Bearing Manufacturers Association (ABMA): [www.americanbearings.org](http://www.americanbearings.org/):

ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings

* + - * 1. Air Movement and Control Association International, Inc. (AMCA): [www.amca.org](http://www.amca.org):

AMCA Standard 204 - Balance Quality and Vibration Levels for Fans

AMCA Standard 210 -  ASHRAE 51 - Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating

AMCA Standard 300 - Reverberant Room Method for Sound Testing of Fans

* + - * 1. National Electrical Manufacturers Association (NEMA): [www.nema.org](http://www.nema.org):

NEMA MG 1 – Motors and Generators

* + - * 1. National Fire Protection Association (NFPA): [www.nfpa.org](http://www.nfpa.org):

NFPA 70 - National Electric Code

* + - 1. ACTION SUBMITTALS
				1. Product Data: Include the following:

Rated capacities and operating characteristics.

Blower Performance Data: Blower performance curves with flow, static pressure and horsepower.

Sound Performance Data: Blower sound power levels in eight octave bands and, A-weighted overall sound power level or sone values.

Motor ratings and electrical characteristics.

Furnished specialty components.

Specified accessories.

Dimensioned standard drawings indicating dimensions, weights, and attachments to other work.

Specifier: If Contractor will be required to provide engineering drawings and calculations for vibration, seismic, or high wind design, insert requirements here.

* + - 1. INFORMATIONAL SUBMITTALS
				1. Source quality-control reports.
				2. Field quality-control reports.
				3. ISO - 9001 certificate.
			2. CLOSEOUT SUBMITTALS
				1. Operation and Maintenance Data: Include routine maintenance, adjustment requirements, safety information, and troubleshooting guide.
			3. QUALITY ASSURANCE
				1. Manufacturer Qualifications: Approved ISO 9001-compliant manufacturer listed in this Section with minimum 10 years' experience in manufacture of similar products in successful use in similar applications, and with an ASME NQA-1 compliant Program.

Specifier: Retain paragraph below if Owner allows substitutions but requires strict control over qualifying of substitutions.

Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:

Product data, including certified independent test data indicating compliance with requirements.

Project references: Minimum of 5 installations not less than 5 years old, with Owner contact information.

Sample warranty.

Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.

Approved manufacturers must meet separate requirements of Submittals Article.

* + - * 1. AMCA Compliance:

Provide fan types tested in accordance with AMCA Standard 210 (air performance) and AMCA Standard 300 (sound performance) in an AMCA-accredited laboratory.

* + - 1. COORDINATION
				1. Coordinate sizes and locations of supports required for blower units.
				2. Coordinate sizes and locations of equipment supports, roof curbs, and roof penetrations.
			2. FIELD CONDITIONS
				1. Handling and Storage: Handle and store blower units in accordance with manufacturer's published instructions. Examine units upon delivery for damage. Store units protected from weather.
			3. WARRANTY

Specifier: Consult TCF for available special Project-specific warranties.

* + - * 1. Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to furnish replacement components for blower units that demonstrate defects in workmanship or materials under normal use within warranty period specified.

Warranty Period: 12 months from startup or 18 months from shipment by manufacturer, whichever first occurs.

1. PRODUCTS
	* + 1. MANUFACTURER
				1. Basis-of-Design Manufacturer: Provide blower units manufactured by **Twin City Fan & Blower**, Minneapolis MN; (763) 551-7600; email: tcf\_sales@tcf.com; website: [www.tcf.com](http://www.tcf.com).
				2. Source Limitations: Obtain cast aluminum pressure blowers from a single manufacturer.
			2. PERFORMANCE REQUIREMENTS
				1. Blower Performance Ratings: [Project site elevation- based] [Sea level-based].
			3. BELT - DRIVEN CAST ALUMINUM PRESSURE BLOWERS
				1. Belt - Driven Centrifugal Blowers.

Basis of Design Product: **Twin City Fan & Blower, Model TPB**.

Permanently attach nameplate displaying serial number and unit information.

Specifier: Coordinate blower orientation with notations on drawings.

* + - * 1. Configuration: Provide unit with blower inlet and discharge directions as indicated on Drawings.
				2. Blower Wheels: Provide cast aluminum wheel with radial bladed backplate or backward curved design. Provide wheels suitable for exhaust purposes where low volume and high pressure applications exist.
				3. Fan Shaft: AISI 1040 or 1045 hot rolled steel, accurately turned, ground, polished, and ring gauged. Select shaft diameter so that first critical speed is minimum 1.40 times maximum speed.

Apply petroleum based rust prevention coating.

* + - * 1. Bearings: Manufacturer's standard field-lubricated ball bearings, based on blower size and mounting orientation, with copper grease lines extended to outside fan housing.

Minimum L-50 Bearing Life: 200,000 hours at maximum operating speed, in accordance with ABMA 9 for ball bearings.

Specifier: Retain option in the following paragraph when it is required that the blower housing be rotatable in the field.

* + - * 1. Housing:

Heavy duty cast aluminum.

Provide eight standard [field adjustable] mounting positions to direct discharge direction.

Provide flanged connections [with] [without] pre-punched bolt holes at fan [outlet] [inlet].

* + - * 1. Supports: Steel angle, intermittently welded with calk at joints between welds.

Specifier: Retain the following paragraph and subparagraphs for belt-driven blowers only.

* + - * 1. Belt Drives:

Drive Components: V-belt drive, rated for minimum [120] [150] percent of motor nameplate horsepower, with machined, [variable] [fixed] - pitch cast-iron sheaves, and heat resistant, oil resistant, static-free V-belts. Provide sheaves with minimum two belt grooves.

* + - * 1. Motors: Comply with NEMA MG-1 for designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Division 23 section "Common Motor Requirements for HVAC Equipment."

Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

Specifier: Select motor electrical data in following subparagraphs, or show this data on the drawing fan schedule. Do not show the data in both places.

Voltage: [115] [208] [230] [277] [460] [575] [\_\_\_\_\_] V; [1] [3] phase; 60 Hz.

Specifier: Select motor enclosure type in first following subparagraph. For motors controlled by VFDs, retain second following subparagraph.

Enclosure Type: [Open, Drip Proof (ODP)] [Totally Enclosed Fan Cooled (TEFC)] [Explosion Proof (XP)].

Provide motors that comply with the Energy Independence and Security Act of 2007 (EISA).

Specifier: For motors controlled by VFDs, retain following paragraph.

When required, provide premium efficiency motor, suitable for inverter duty, for motors controlled by Variable Frequency Drive (VFD).

Shaft Grounding Ring: Provide conductive ring to stay in continuous contact with motor shaft to collect stray currents and shunt them to frame ground.

Specifier: If factory disconnect is required, select NEMA enclosure rating in following paragraph, and select one subparagraph below to specify factory or field mounting. Retain second subparagraph when NEMA 7/9 (explosion proof) option is selected.

Disconnect Switch: Unfused, NEMA [1] [3R] [4] [4X] [7/9 explosion proof], selected in accordance with Division 26 section "Enclosed Switches."

Ship disconnect switch loose for field mounting and wiring.

Specifier: Retain the following paragraph for belt-driven fans only.

* + - * 1. Motor Mounting Platform: Heavy-duty motor mounting platform that allows adjustment of drive belt tension.
				2. Vibration Isolation:

Specifier: Retain paragraph and subparagraph below, and coordinate options with project design.

Provide isolation of blower from connected piping, duct work and foundation in accordance with fan manufacturer's requirements, and Division 23, Section "Vibration and Seismic Controls for HVAC Piping and Equipment."

Isolation Type Base:

Spring isolation base: Provide spring isolators [and seismic restraints] with [1 inch (25.4 mm)] [2 inch (51 mm)] deflection.

Rigid Mounting Base: Unitary type.

* + - * 1. Finishes:

Do not apply coatings to aluminum components.

After fabrication, clean and chemically pretreat ferrous metal parts by phosphatization.

Apply two coats of air dried enamel finish to carbon steel components.

* + - * 1. Accessories:

Specifier: Accessories listed in subparagraphs below are optional TCF features for this unit. Consult TCF representative for recommended options based upon Project requirements.

Volume Control Devices

Slide Gate Dampers, [Inlet] [Outlet]: Provide cast aluminum frame and manually operated galvanized sliding gate. Include locking screw.

Inlet and Outlet Safety Screen: Spiral wire type featuring electrostatic zinc finish. Mounts over inlet/outlet collar: Retain following two paragraphs if safety screens are required. Select options in second following paragraph to designate screen locations.

Inlet and Outlet Guards: Removable, galvanized steel wire with radial supports.

Provide screens at fan [inlet] [outlet].

Specifier: The shaft seal in the following paragraph is not air tight. For air tight, or other custom shaft seals, contact a TCF technical representative and revise the following paragraph.

Shaft seal, including PTFE wear plate and rubber seal, to limit airstream infiltration.

Belt Guard: Provide [OSHA compliant] steel, bolt‑on belt guard to cover belts and sheaves.] [Paint belt guard yellow.]

Shaft Guard: Provide [OSHA compliant] steel, bolt‑on shaft guard.] [Paint shaft guard yellow.]

Drain: 1/2 inch NPT [with plug].

Specifier: Filters are recommended where heavy dust conditions exist. Specify standard stub inlet of fan for mounting.

Inlet Filter: Provide filter housing constructed of carbon steel with baked enamel finish. Provide [polyester] [paper] [wire-mesh] filter media [with] [without] a powder coated steel hood.

Weather Hood: Provide powder coated steel, weatherproof hood with birdscreen located at fan [inlet] [outlet].

* + - * 1. Blower Capacities and Characteristics: Refer to Drawing schedule.
			1. SOURCE QUALITY CONTROL
				1. Factory Run Test: Test run assembled blower units prior to shipment at specified operating speed or maximum RPM allowed. Statically and dynamically balance each wheel in accordance with AMCA Standard 204 "Balance Quality and Vibration Levels for Fans" to Fan Application Category BV-3, Balance Quality Grade G6.3. Obtain balance readings by electronic equipment in the axial, vertical, and horizontal directions on each set of bearings.

Submit report of factory run test.

1. EXECUTION
	* + 1. EXAMINATION
				1. Examine areas to receive blowers. Notify Engineer regarding conditions that may adversely affect installation, operation, or maintenance of blowers. Proceed with installation once conditions are in accordance with manufacturer's published instructions.
			2. PROTECTION
				1. Protect adjacent construction and finished surfaces during installation and testing.
				2. Except for operational testing, do not operate blower during construction.
			3. INSTALLATION
				1. Install blowers in accordance with Contract documents and manufacturer's published instructions.

Specifier: Insert applicable installation requirements for vibration, seismic, and high wind design if applicable to installation.

* + - * 1. Install blower units with adequate clearances for service and maintenance.

Specifier: Coordinate duct installation and specialty arrangements with schematics on Drawings and with requirements specified in duct systems. If Drawings are explicit enough, these requirements may be reduced or omitted.

Retain option for companion flanges when required.

* + - * 1. Duct Connections: Drawings indicate general arrangement of ducts and duct accessories. Where indicated on Drawings, make final duct connections with flexible connectors. Flexible connectors are specified in Division 23 section "Air Duct Accessories."

Install connecting ducts with adequate clearances for service and maintenance.

* + - * 1. Electrical Connections: Connect wiring in accordance with NFPA 70 and Division 26 section "Low-Voltage Electrical Power Conductors and Cables."

Ground and bond equipment according to Division 26 section "Grounding and Bonding for Electrical Systems."

* + - * 1. Equipment Identification: Label units according to Division 23 section "Identification for HVAC Piping and Equipment."
			1. FIELD QUALITY CONTROL

Specifier: Select option in paragraph below to define the party responsible for final tests and inspections to be performed.

* + - * 1. [Owner will retain] [Contractor shall retain] qualified testing agency to perform field tests and inspections.

Specifier: Retain first paragraph below to describe tests and inspections to be performed.

* + - * 1. Tests and Inspections:

Verify that unit is secured to supports, and that duct and electrical connections are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.

Verify that cleaning and adjusting are complete.

Disconnect blower belt drive from motor. Verify proper motor rotation direction, and verify blower wheel free rotation and smooth bearing operation. Reconnect blower drive system, align and adjust belts, and install belt guards.

Verify proper motor rotation direction, and verify blower wheel free rotation and smooth bearing operation.

Verify that manual and automatic volume control, and fire and smoke dampers in connected ductwork systems are in fully open position.

Disable automatic temperature-control actuators, energize motor, adjust blower to indicated rpm, and measure and record motor voltage and amperage.

Shut unit down and reconnect automatic temperature-control actuators.

Remove and replace malfunctioning units and retest as specified above.

* + - * 1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
				2. Submit test and inspection reports.
			1. ADJUSTING AND CLEANING
				1. Adjust, clean, and maintain installed blower units in accordance with manufacturer's published instructions.

END OF SECTION