

Medium Pressure Axial Fans

Model TBI-CA Level 4 & 5 with Cast Aluminum Propeller

Belt Drive • Clean Air or Fume Exhaust



BUILDING VALUE IN AIR.



April
2021

Model TBI-CA inline medium pressure axial fans are designed for use in ducted or unducted applications with pressures ranging from 1 to 3.25 inches wg (250 - 812 Pa). TBI-CA Level 4 and 5 models are manufactured with heavy gauge steel and aircraft quality aluminum hubs and blades to move a wide volumetric flow efficiently in light commercial to severe industrial applications. The TBI-CA is tested in Greenheck's accredited sound and air laboratory to ensure that it meets stringent performance requirements. In addition, all of our products pass rigorous endurance testing to ensure a long, reliable operating life.

Typical applications include:

- General exhaust, supply or return air
- Industrial or commercial space ventilation
- Fume hood exhaust
- Paint booth exhaust

TBI-CA Standard Features:

- Sizes from 18 - 60 inch (457 - 1,524 mm) propeller diameters
- Volume Range: 1,300 - 95,000 cfm (2,200 - 161,400 m³/hr)
- Static Pressure: Up to 3.5 inches wg (870 Pa)
- Temperatures: Up to 180°F (82°C) continuous
- Adjustable pitch cast aluminum propeller
- Spark resistant construction
- Motor and drives out of airstream

TBI-CA Level 4



TBI-CA Level 5

Includes Bolt-on Vane Section



Enjoy Greenheck's extraordinary service, before, during and after the sale.

Greenheck offers added value to our wide selection of top performing, energy-efficient products by providing several unique service programs.



- Our Quick Delivery program ensures shipment of in-stock products within 24 hours of placing your order. Our Quick Build made-to-order products are manufactured in 1-3-5-10-15-20 or 25-day production cycles, depending upon its complexity.
- eCAPS® online selection guides you to choose the best value product for your building projects. It includes fan, louver, make-up air and dedicated outdoor air systems (DOAS) selection, as well as a damper guide, and toolbox.
- Greenheck's free computer aided product selection program CAPS®, rated by many as the best in the industry, helps you conveniently and efficiently select the right products for the challenge at hand.
- Our 3D service allows you to download, at no charge, easy-to-use AutoDesk® Revit® 3D drawings for many of our ventilation products.

Find out more about these special services at greenheck.com



Adjustable Pitch, Cast Aluminum Propellers

Levels 4 and 5 use heavy-duty, cast aluminum airfoil propellers that are designed to meet specific capacity and pressure requirements.

- Hubs are single piece aluminum casting.
- Blade bases are cast around steel stems and allow for manual adjustment of blade pitch in the field.
- All propellers are dynamically balanced to assure vibration-free operation.

Electrostatic Powder Paint

Powder coating offers a uniform, durable, and high quality finish. This is a one-coat process applied over a phosphatized surface that meets or exceeds the corrosion resistance of a comparable wet paint.

Greenheck offers a number of proprietary coatings applied via “electrostatic powder”. The standard coating, Permator™, is excellent for indoor or outdoor applications and has resistance to many common chemicals.



Maintenance / Serviceable Construction Advantages

The following features have been incorporated into the design of these fans to allow for quick and easy field service.

- Bearing lubrication is performed through extended grease fittings located on the outside of the fan housing.
- An adjustable motor base is provided for tightening the fan belts.
- Model TBI-CA Level 5 bolt-on vane section removes to allow access to hub and blades.
- Propellers are easily removed with the use of taper lock bushings.

For additional access to the propeller and internal fan components for field service, see the “Easy Access Construction” option in the Accessories section.



Complete Assembly and Testing

TBI-CA fans are completely assembled and tested before shipment. Our inspectors ensure that the fan is vibration-free and that they are electrically safe for field operation.



Easy to Install and Operate

The compact design of the TBI-CA model helps when fitting into tight spaces. In addition, integral connection flanges (pre-punched) and optional Universal Mounting brackets accommodate motor position changes for last minute modifications or unexpected installation obstacles. A roof upblast configuration of the fan is also available (see page 5).

Housing

Housings are continuously welded to prevent air leakage. All steel constructed units are provided with Permator™ coating. Aluminum or stainless housing construction is available upon request.

Inlet and Outlet Flanges

Integral inlet and outlet flanges with mounting holes are provided for an airtight ductwork connection.

Bearings

Bearings are air handling quality, grease lubricated, pillow block type. Bearings are selected with a basic rating fatigue life L_{10} in excess of 80,000 hours (equal to L_{50} 400,000 hours) at each fan's maximum operating speed when mounted in a horizontal configuration.

Belt and Bearing Tube

Belts, bearings, and drives are protected from the airstream by a heavy gauge belt tube and bearing cover.

Adjustable Motor Base

Rigid structural motor bases are welded to the fan housing and include heavy duty adjustment screws for belt tensioning.

Extended Lube Lines

Extended lube lines with grease fittings allow bearing lubrication without disassembling the fan.

Drives

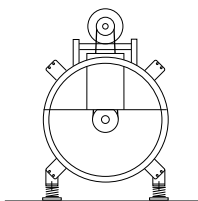
Greenheck offers either constant or adjustable speed drives for fan speed adjustments. Belts are static free and oil resistant.

Motors

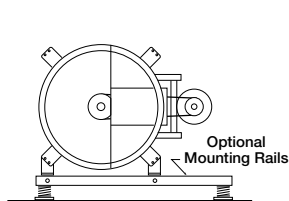
All motors meet the classification for NEMA design B. Motors are available in open drip proof, totally enclosed, or explosion proof enclosures.

Vane Section - Level 5

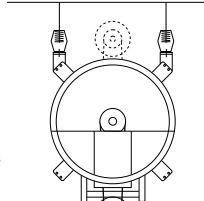
Straightening vanes improve efficiencies 20% by making airflow uniform and less turbulent. Additionally, this section removes to allow access to the fan hub and blade assembly.



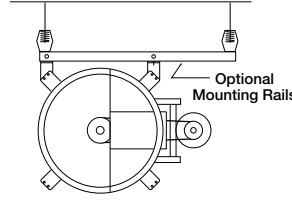
Horizontal Base Mount
Fig. 1



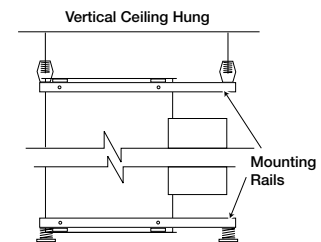
Horizontal Base Mount
Motor at 3 or 9 o'clock position
Fig. 2



Horizontal Ceiling Hung
Fig. 3



Horizontal Ceiling Hung
Motor at 3 or 9 o'clock position
Fig. 4



Vertical Ceiling Hung
Fig. 5

Horizontal and Vertical Mounting Configurations (Brackets Optional)

All fans can be mounted horizontally or vertically. For ease of installation, eight optional mounting brackets can be welded to each fan. These brackets along with mounting supports provide for Greenheck's universal mounting system.

Fig. 1 Horizontal Base Mount

Each fan is shipped as standard in this arrangement. Motor at 12 o'clock is standard.

Fig. 2 Horizontal Base Mount with motor at 3 or 9 o'clock

A set of optional mounting rails are required for this installation. This is the base mounting position required with the easy access option.

Fig. 3 Horizontal Ceiling Hung

In this installation the supports can be positioned for mounting the motor at either 6 or 12 o'clock.

Fig. 4 Horizontal Ceiling Hung with motor at 3 or 9 o'clock

A set of optional mounting rails are required.

Fig. 5 Vertical Mount

All TBI-FS fans can be mounted vertically (ceiling hung or base mount) for either upward or downward airflow. Optional mounting rails are recommended for belt driven fans.

NOTE: All fans are shown with optional mounting brackets and vibration isolators. See the appropriate submittal drawings or installation manual for complete dimensional data.

Curb Mounted Roof Upblast

TBI-CA axial fans can be offered with a roof curb mounted upblast design. This configuration allows the fan to be easily mounted to a roof curb such as Greenheck model GPFHL. The roof upblast design offers the following features and options:

Motor Cover – Weatherproof motor cover shields the motor and drive components from dust, dirt, and moisture. Motor covers meet OSHA standards.

Fully Welded Curb Cap – Provides a transition from square roof curb to tubular fan housing. Welded to the fan inlet.

Windband with Butterfly Dampers – Bolt-on section eliminates rain penetration. Includes rubber gasket at damper closure edge to reduce noise when closing. Standard damper blades are steel. Optional aluminum damper blades for low volume applications are also available.

Correction Factors for Roof Upblast

The constants in the TBI-CA roof upblast corrections table can be used to correct the air data in this catalog to include the losses for roof upblast designs. The required additional static pressure can be calculated by multiplying the appropriate correction factor times the CFM squared.

Example:

A size 36 TBI-CA is required to ventilate 25,000 cfm against 2 in. wg external static pressure and will be configured with roof upblast construction. The additional pressure to be added to the design static pressure before selecting the fan using the cataloged air data is as follows:

$$P_s = K \times \text{CFM}^2$$

$$P_s = 4.78\text{E-}10 \times 25,000^2$$

$$P_s = 0.299$$

The fan can now be selected from the catalog at 25,000 cfm against 2.299 in. wg

Unit Size	K-Factor
18	2.87E-8
20	1.59E-8
24	4.16E-9
30	1.23E-9
36	4.78E-10
42	2.25E-10
48	1.21E-10
54	7.10E-11
60	4.24E-11

Belt Guard

Belt guards provide protection from rotating pulleys and belts. Belt guards meet OSHA standards.

Motor Cover

Weatherproof motor cover shields the motor and drive components from dust, dirt, and moisture for indoor/outdoor installations. Motor covers meet OSHA standards.

Inspection Section

Inspection sections are an easily removable length of duct and are recommended to improve serviceability. Inspection sections are provided with a full diameter removable access panel.

Inspection Door

Bolted or hinged inspection door provides access through the fan tube for inspection of the propeller, bearings and drives.

Easy Access Construction

Recommended to provide inspection, cleaning and service of internal fan components. Allows for the removal of the fan shaft and bearings through the housing without removing the fan from the duct.

Inlet and Outlet Guards

Removable inlet and outlet guards provide protection for personnel and equipment in ducted or non-ducted installations. Inlet and outlet guards meet OSHA standards.

Inlet Bell with Inlet Guard

Inlet bells minimize entry losses in non-ducted applications by providing more uniform airflow into the propeller blades. Inlet bells with inlet guard meet OSHA standards.

Companion Flanges

Companion inlet flanges and outlet flanges with prepunched holes allow for bolted flange to flange connection with ductwork.

Shaft Seal

Neoprene or felt shaft seals are available to prohibit leakage of air into the bearing compartment of the fan.

Universal Mounting Brackets

Universal Mounting brackets include all hardware necessary to position the fan horizontally or vertically in either base mount or ceiling hung applications.

Mounting Rails

Mounting rails are required for horizontal mounting of TBI-CA belt driven fans when the motor is to be located in the 3 or 9 o'clock position or for all vertical applications. Universal Mounting brackets are required.

Isolators

Both base-mount and hanging isolators are available in either neoprene or spring mounts. The isolators are furnished in sets of four and are sized to match the weight of each fan.

Special Coatings

Special coatings are available for protective purposes. Coatings are applied before assembly so that each manufactured component is coated inside and out. Painting the unit a specified color for appearance is also an option.

UL/cUL-705

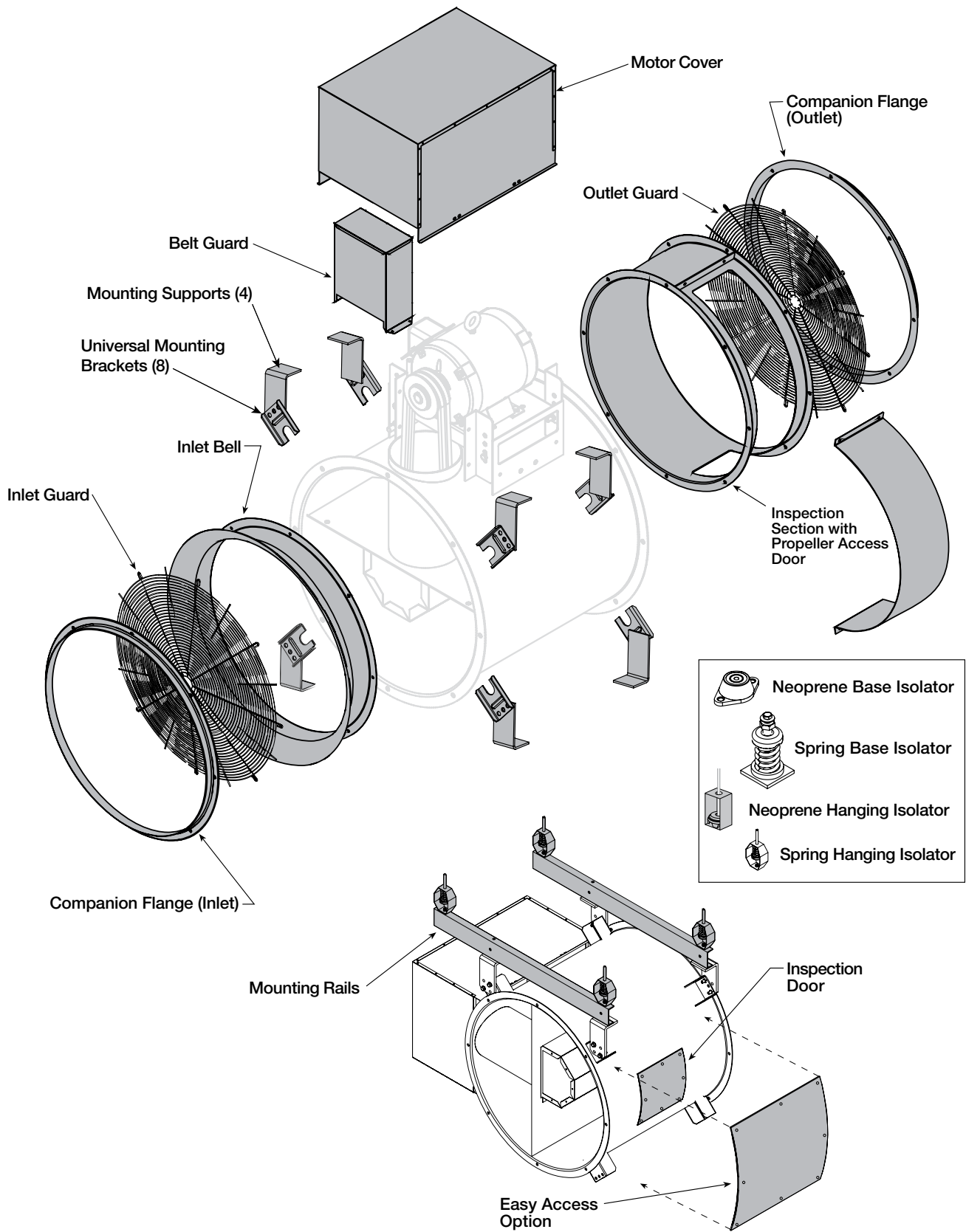
UL/cUL 705 electrical listing available on 50 or 60 Hz motors supplied by Greenheck.



Disconnect Switches

Toggle and heavy-duty disconnect switches are available for positive electrical shut-off and safety in servicing fans. The switches can be factory mounted or shipped loose for field mounting.

- NEMA-1 — General purpose (indoor)
- NEMA-3R — Rainproof (outdoor)
- NEMA-4 — Watertight (outdoor)
- NEMA-7 & 9 — Class 1 and 2 hazardous locations



Specifications

Tube Axial Specification — TBI-CA Level 4 and 5

Inline fans shall be of the axial type with cast aluminum airfoil propellers.

The housing shall be constructed of continuously welded steel and include integral punched inlet and outlet flanges to prevent air leakage. The housing, bearing support and motor base shall be constructed of structural members to prevent vibration and rigidly support the shaft, bearings, and motor.

Blades shall be airfoil design. Hub and blades shall be heat treated cast aluminum alloy A365-T6 with hub blade bases and sockets precision machined. Propeller hub is a single piece casting with a minimum of eight blades. Rotor blade pitch shall be manually adjustable within horsepower limitations. Rotors to be statically and dynamically balanced. A standard square key or tapered bushing shall lock the rotor to the fan shaft. Blades shall be attached to the hub with steel studs.

Steel housings and structural components to be coated with Permatector™, an electrostatically applied thermosetting polyester urethane. Minimum coating thickness to be 2 mils.

Fan performance shall be based on tests conducted in accordance with AMCA Standard 210.

Fan shall be model TBI-CA as manufactured by Greenheck Fan Corporation of Schofield, Wisconsin.

Additional Belt Drive Specification

Bearings shall be cast iron pillow block, grease lubricated and self-aligning. Bearings shall be Air Handling Quality and tested for reduced swivel torque, bore size, noise, and vibration. Bearings shall be selected for an L₁₀ life, per ABMA standards, in excess of 80,000 hours for horizontal applications (equal to L₅₀ 400,000) or L₁₀ life of 40,000 hours for vertical applications (equal to L₅₀ 200,000).

Turned, precision ground and polished steel shafts shall be sized so the first critical speed is at least 25% over the maximum operating speed for each level of construction.

Additional Level 5 Specification

Bolt-on straightening vane section to be fastened to outlet flange. Vanes shall be welded to inner diameter of bolt-on section. Minimum of seven blades constructed of at least 10 gauge material to be used.



Building Value in Air

Greenheck delivers value to mechanical engineers by helping them solve virtually any air quality challenges their clients face with a comprehensive selection of

top quality, innovative air-related equipment. We offer extra value to contractors by providing easy-to-install, competitively priced, reliable products that arrive on time.

And building owners and occupants value the energy efficiency, low maintenance and quiet dependable operation they experience long after the construction project ends.

Our Commitment

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

Product warranties can be found online at Greenheck.com, either on the specific product page or in the literature section of the website at Greenheck.com/Resources/Library/Literature.

