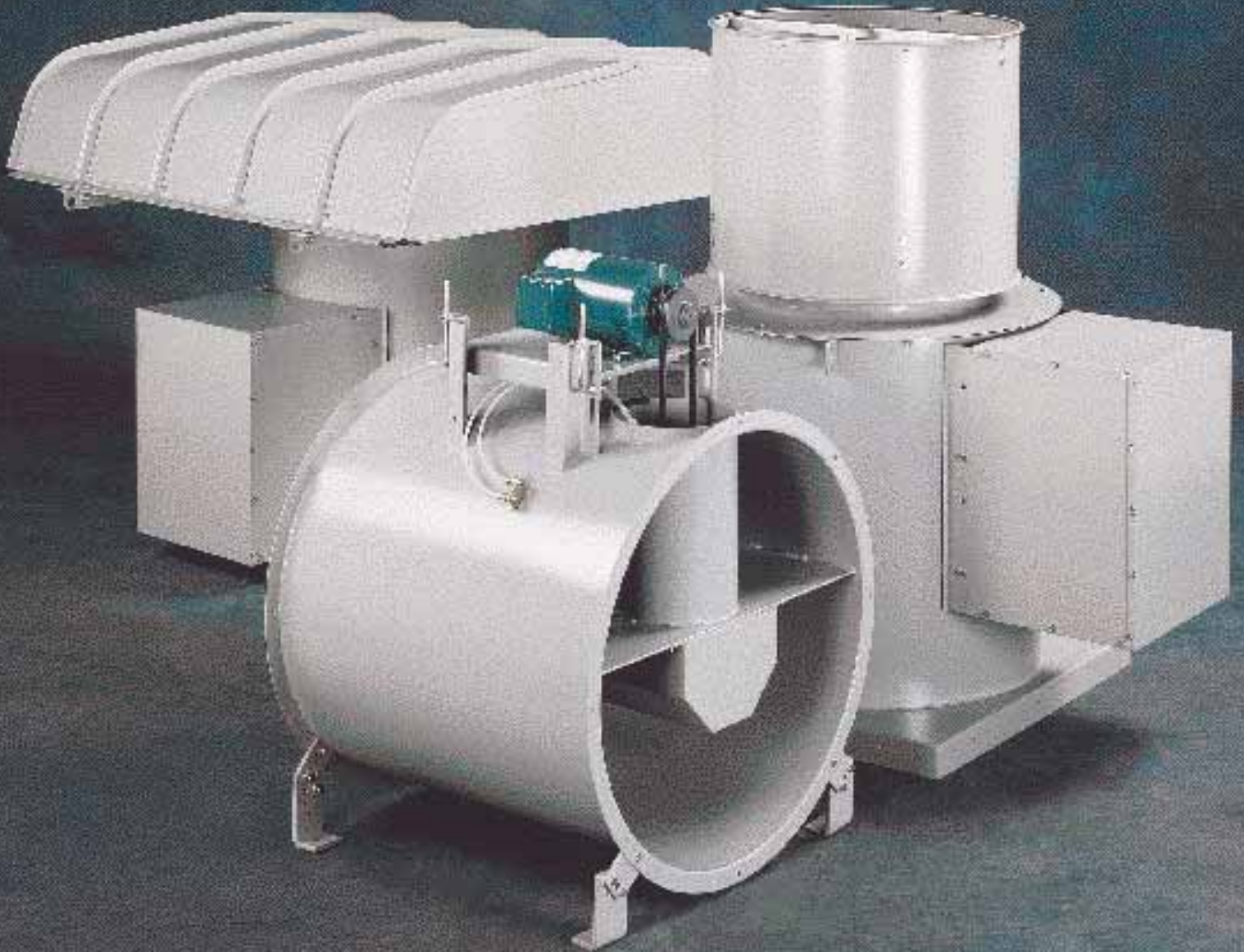


Model TCB Tubular Centrifugal Fans

*Inline - Horizontal or Vertical
Roof Upblast
Roof Supply*




TUBULAR CENTRIFUGAL FANS

Models TCB, TCBRU, and TCBRS, are designed for inline, roof upblast, and roof supply installations. Whether the application is commercial or industrial, Greenheck tubular centrifugal fans provide the quiet, efficient, and reliable air performance required.

Models TCB, TCBRU, and TCBRS are belt driven with motors out of the airstream. Backward inclined aluminum wheels, fan shafts and bearings are sized to match the level of duty and motor size.

Customers can be assured of accurate sound and air performance from all Greenheck fans as a result of thorough testing in our laboratory.



Greenheck certifies that the model TCB tubular centrifugal inline fans shown herein are licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.



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Model TCB - INLINE FAN

- Sizes from 9 to 36 wheel dia.
- CFM Range: 360 to 24,000
- Static Pressure: Up to 4.5 in W.G.
- Max Operating Temperature: 200°F
- Horizontal or Vertical Mounting
- Options: - Easy Access
- All Aluminum Construction



Model TCBRS - ROOF SUPPLY FAN

- Sizes from 9 to 36 wheel dia.
- CFM Range: 360 to 24000
- Static Pressure: Up to 4.5 in W.G.
- Max Operating Temperature: 200° F
- Options: - Insect Screen or Filters
- Easy Access
- All Aluminum Construction

TWO LEVELS OF CONSTRUCTION

All TCB inline and roof mounted fans are available in two levels of construction to provide the most efficient and economical selections. Construction differences between level 1 and 2 selections include the impeller, the inlet cone, the shaft size, and the bearings. The housings for both levels are identical in material gauge and overall design.



Level 1 Construction

- Maximum pressure capabilities of 2 inches W.G.
- Highest efficiencies at static pressures below 1.5 inch W.G.
- Most economical selections

Level 2 Construction

- Maximum pressure capabilities of 4.5 inches W.G.
- Highest efficiencies above 1.5 inches W.G.
- Completely welded aluminum wheel
- Increased shaft and bearing diameter.
- Increased horsepower and motor frame size capability.



EASY ACCESS FEATURE

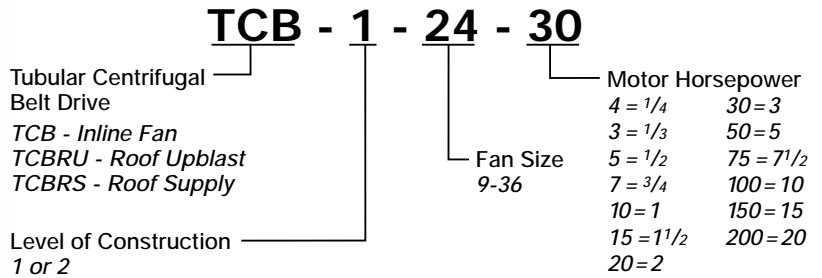
All models are available with an optional access door for serviceability of fan components without removing the fan or duct. See page 4 for details.

Model TCBRU - ROOF UPBLAST FAN

- Sizes from 9 to 36 wheel dia.
- CFM Range: 425 to 24,000
- Static Pressure: Up to 4.5 in W.G.
- Max Operating Temperature: 200° F
- Options: – Easy Access
– All Aluminum Construction

MODEL NUMBER CODE

The model number system is designed to completely identify the fan. A detailed explanation of the model number code for TCB fans is shown below.



STANDARD CONSTRUCTION FEATURES *for all models*

Inlet & Outlet Flanges

Flanged inlets and outlets with mounting holes are provided for duct connections on inline fans.

Housing

Housings are continuously welded. Standard housing material is painted steel with aluminum construction optional.

Protective Coating

All steel constructed units are coated with *Permatector™*, a thermosetting polyester urethane. Aluminum units are uncoated.

Type B Spark Resistance

All fans have aluminum wheels and a nonferrous (aluminum) rub ring which surrounds the fan shaft where it passes through the drive cover. This construction meets Type B spark resistant requirements.

Bearings

Standard bearings are grease lubricated, self aligning, ball type in pillow block mounts. Bearings are selected for a minimum L(10) life in excess of 80,000 hours at maximum cataloged operating speeds.

Belt & Bearing Tube

Belts, bearings, and drives are protected from the airstream by heavy gauge belt tubes and bolted bearing covers with shaft seals.

Extended Lube Lines

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



OPTIONAL CONSTRUCTION *for all models*

Aluminum Construction

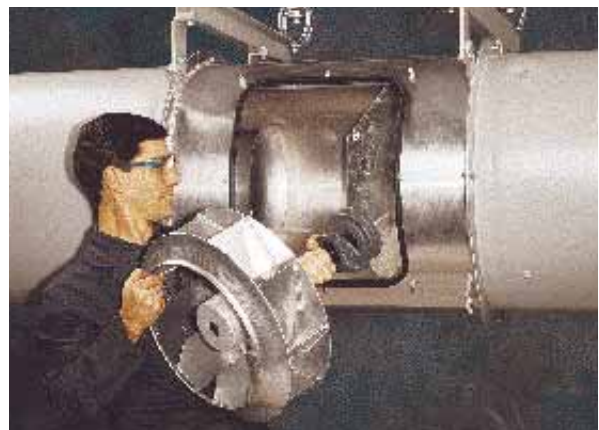
Aluminum construction is available on all TCB models including upblast and roof supply. Aluminum fans are an excellent choice for applications involving moisture, saturated steam vapors, or sea coast installations.

Easy Access

The Easy Access option is highly recommended to provide inspection, cleaning and service of internal fan components. By removing one access panel, service to the wheel, shaft, and bearing assembly is possible without upsetting duct connections. In addition, all internal fan components can be removed from the fan through the access panel.

Easy Access construction is available on all levels and sizes of TCB, TCBRU, and TCBRS. Easy Access is also available with aluminum fan construction.

Note: The Easy Access panel is located 180° from the motor position.



Model TCB INLINE FAN

TUBULAR CENTRIFUGAL BELT DRIVE



The Model TCB inline fan is the ideal choice for installations with straight-through airflow in ducted systems. Greenheck's standard fan can be mounted in any position from horizontal to vertical, allowing installation in the smallest possible space at the lowest installation cost. The centrifugal wheels used in this design provide higher efficiencies and lower sound levels than axial type inline fans when used in medium pressure ducted systems. TCB fans are available in either painted steel or aluminum construction.

Typical applications include:

- General exhaust or supply
- Industrial space ventilation
- Fume hood exhaust (special coatings are available)
- Combustion air
- Roof exhaust or supply (with weatherhood)

Universal Mounting

All TCB fans can be mounted horizontally or vertically. For ease of installation, eight mounting brackets are welded on each fan. The eight brackets along with standard mounting supports, provide a 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

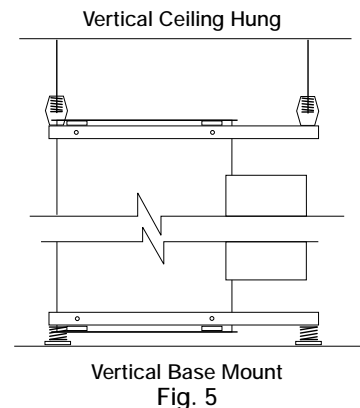
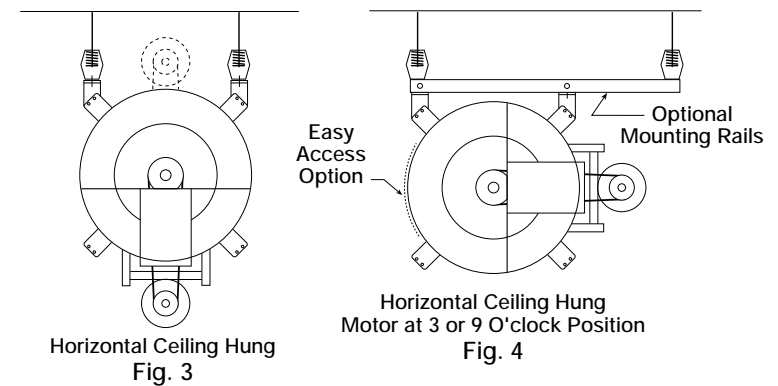
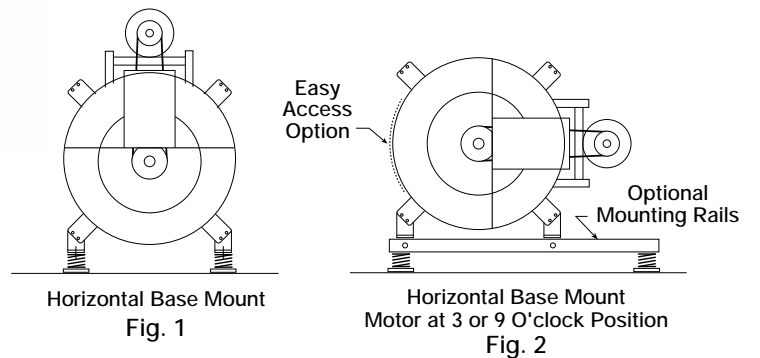
A set of optional mounting rails are required for this installation.

Fig. 5 Vertical Mount

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

NOTE:

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



Model TCBRU ROOF UPBLAST FAN



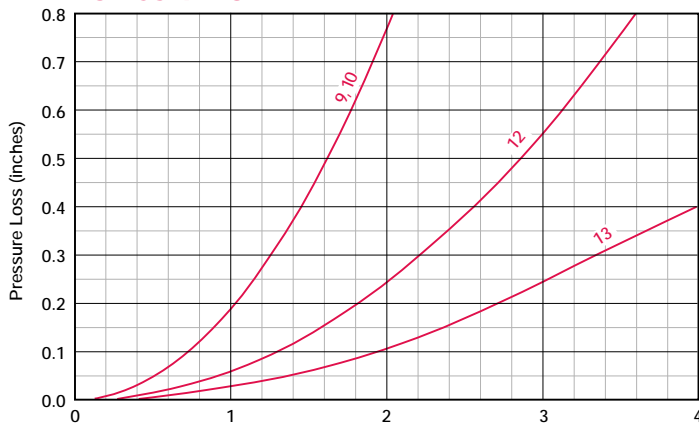
The TCBRU is ideal for roof upblast exhaust systems with moderate system static pressures and for applications where quiet operation is essential. Standard features include a necked-down windband section which creates the high outlet velocities necessary to carry contaminated exhausts away from nearby make-up air units. All TCBRU fans include motor covers for weather protection of the motor and drives, gravity operated dampers to prevent backflow into the building, and a welded curb cap for ease in mounting to a roof curb. TCBRU fans are available in either painted steel or aluminum construction.

Typical roof upblast applications include:

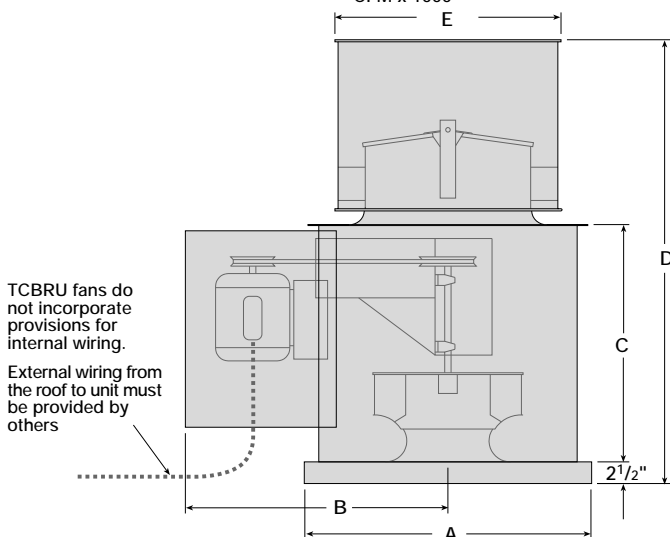
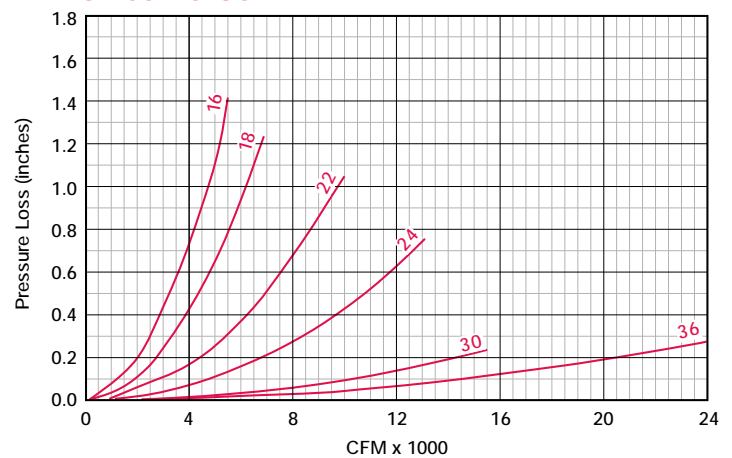
- Low CFM/High velocity exhaust
- General exhaust at static pressure to 4 inches W.G.
- Fume hood exhaust
- Laboratory exhaust
- Industrial process exhaust

When selecting TCBRU fans use the TCB inline performance data (pgs. 10 to 29) along with the following system effect curves. The pressure loss determined below must be added to the system static pressure to assure accurate selections. Greenheck's Computer Aided Product Selection (CAPS) software will add these system effects automatically.

System Effect Curves Sizes 9-13



System Effect Curves Sizes 16-36



Dimensional Data

Size	A	B	C	D	E	Minimum CFM Required to Open Dampers
9	22	21 $\frac{1}{2}$	23	45	20	425
10	22	21 $\frac{1}{2}$	23	45	20	425
12	22	21 $\frac{1}{2}$	23	45	20	1250
13	24	23 $\frac{1}{2}$	24 $\frac{1}{2}$	50 $\frac{1}{2}$	24	1800
16	28	25 $\frac{1}{2}$	28 $\frac{1}{2}$	53	28	2030
18	34	28 $\frac{1}{2}$	31	57 $\frac{1}{2}$	30	2570
22	40	34	35 $\frac{1}{2}$	64	34	2740
24	46	36 $\frac{1}{2}$	42	74 $\frac{1}{2}$	40	4760
30	52	42 $\frac{1}{4}$	48 $\frac{1}{2}$	84	46	6600
36	58	45 $\frac{1}{2}$	54	94 $\frac{1}{2}$	52	8700

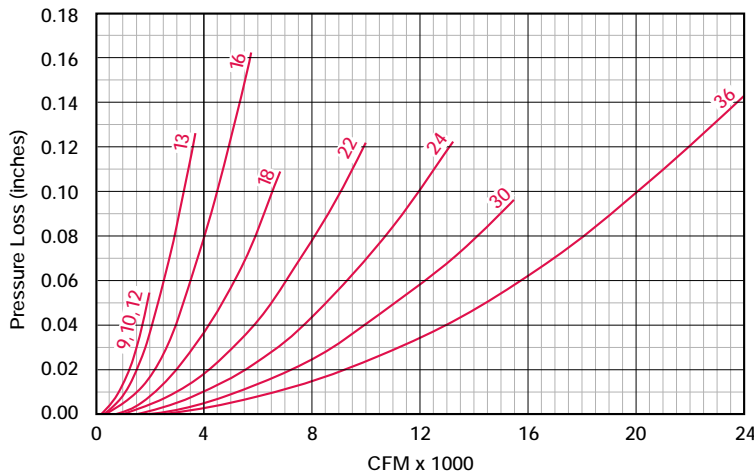
Model TCBRS ROOF SUPPLY FAN



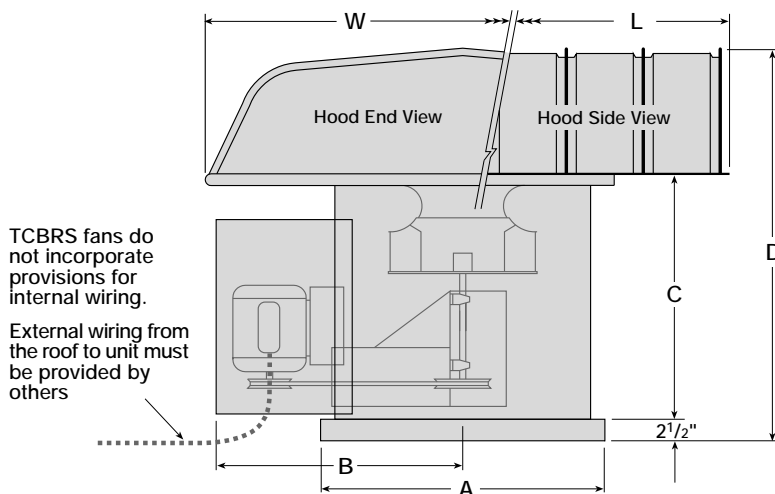
The TCBRS roof mounted supply fan is designed for intake air systems with pressures up to 4 inches of W.G. and is a good selection when low sound is required. The TCBRS design provides for the hood intake to be located at a sufficient height above the roof to limit entry of roof debris and snow. In addition, the hood has sufficient intake area to keep velocities low. Filters are also available to collect dust and moisture before entering the building. Motor and drive protection is provided with a weatherproof motor cover. For ease of installation, TCBRS fans are shipped assembled and have curb caps for attaching to roof curbs. TCBRS fans are available in either painted steel or aluminum construction.

- Typical roof supply applications include:
- Ducted supply systems
 - Industrial space supply
 - Filtered supply
 - Kitchen hood supply

System Effect Curves



TCBRS fan selections can be made using the TCB inline performance data (pgs. 10 to 29) along with the following system effect curves. The pressure loss determined below must be added to the system static pressure to assure accurate selections. Greenheck's Computer Aided Product Selection (CAPS) software will add these system effects automatically.



Dimensional Data

Size	A	B	C	D	L	W
9	22	21 ¹ / ₂	25 ¹ / ₂	39 ¹ / ₂	39	46
10	22	21 ¹ / ₂	25 ¹ / ₂	39 ¹ / ₂	39	46
12	22	21 ¹ / ₂	25 ¹ / ₂	39 ¹ / ₂	39	46
13	24	23 ¹ / ₂	27	43 ¹ / ₂	39	54
16	28	25 ¹ / ₂	31	47 ¹ / ₂	51	55
18	34	28 ¹ / ₂	33 ¹ / ₂	50	63	64
22	40	34	38 ¹ / ₂	59	75	73
24	46	36 ¹ / ₂	45	67 ¹ / ₂	87	82
30	52	42 ¹ / ₄	52 ¹ / ₂	76	99	88
36	58	45 ¹ / ₂	58	85 ¹ / ₂	111	88

ACCESSORIES

Belt Guard

Totally enclosed belt guards provide protection from rotating pulleys and belts.

Motor Cover

Weatherproof motor covers shield the motor and drive components from dust and dirt and from moisture for outdoor installations. Motor covers also serve as a complete personal guard, plus they are easily removed for service access. Motor covers are standard on TCBRU and TCBRS fans.

Companion Flanges

Companion inlet flanges and outlet flanges with prepunched holes are available for all fan sizes in painted steel construction.

Inlet and Outlet Guards

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

Inspection Door

Bolted or hinged, quick opening doors provide access for cleaning or inspection.

Inspection Section

Inspection sections serve as a length of duct that can be easily removed to provide for complete access to the fan for servicing. Each section includes a bolted inspection door.

Isolators

Both base mount or 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.

Mounting Rails

Mounting rails are required for horizontal mounting of TCB fans when the motor is to be located in the 3 or 9 o'clock position. Mounting rails are also recommended for all vertically mounted inline fans.

Special Coatings

Special coating are available for protective purposes. Coatings are applied before assembly so that each manufactured component is coated inside and out. Painting the exterior a specified color for appearance is also an option. Consult Greenheck's Special Coatings Bulletin, or consult your factory representative for details.

Inlet Vane Dampers

Nested inlet vane dampers for controlling air volume are available on model TCB inline fans with Level 2 steel construction in fan sizes 12 through 36.

Additional Options for TCBRU and TCBRS

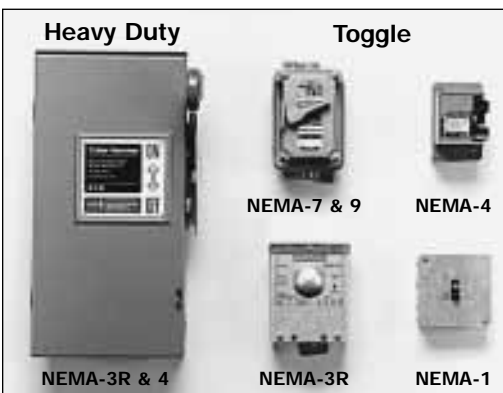
TCBRU fans are available with outlet screens to shield the fan discharge and damper from debris. TCBRS fans are available with either aluminum insect screen or filters at the hood intake (Birdscreen is standard).

Roof Curbs

Prefabricated roof curbs are available to reduce installation time and costs by ensuring compatibility between the fan, the curb, and the roof opening. All curbs are lined with fiberglass insulation to prevent condensation and reduce sound levels. See Greenheck's roof curb catalog for complete details.

ELECTRICAL ACCESSORIES

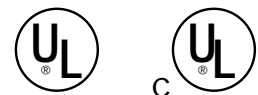
Disconnect Switches



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

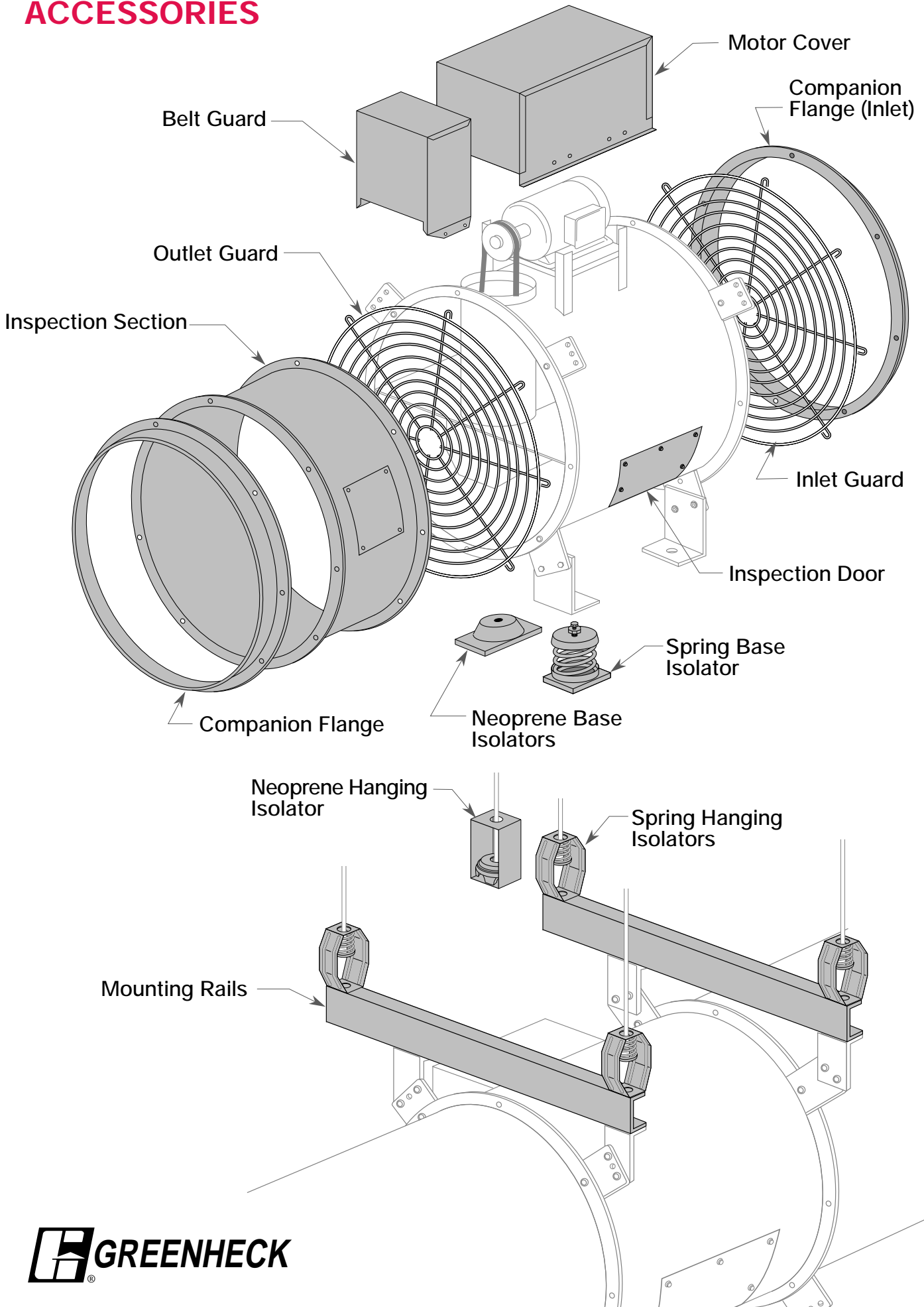
- NEMA-1- General purpose
- NEMA-3R - Rainproof
- NEMA 4 - Watertight
- NEMA-3R & NEMA 4 Heavy Duty
- NEMA-7 & 9 - for Class 1 and Class 2 hazardous locations.

All TCB inline fans can be specified to bear the following seals:

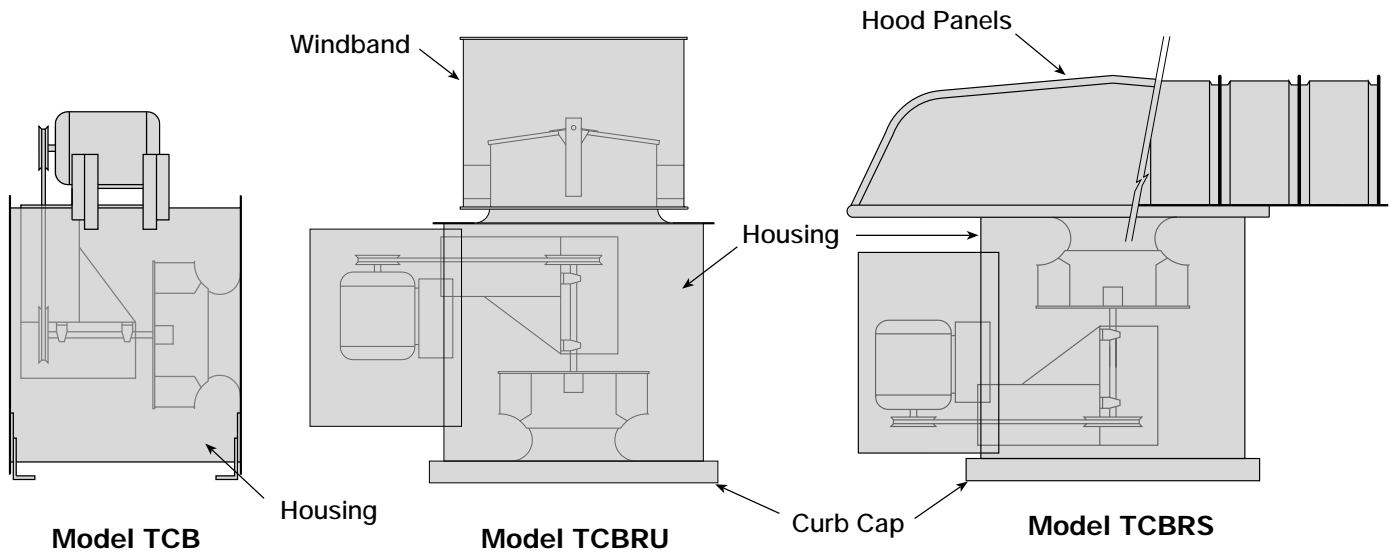


TCB-1 and TCB-2 models shown herein are UL and cUL listed E40001

ACCESSORIES



CONSTRUCTION SPECIFICATIONS



Steel Construction (gauge thickness)

Size	Housing	Curb Cap	Windband	Hood Panels	Shaft Diameter	
					Level 1	Level 2
9	12	12	20	22	3/4	1
10	12	12	20	22	3/4	1
12	12	12	20	22	3/4	1
13	12	12	20	22	3/4	1
16	12	12	20	22	1	1 3/16
18	12	12	20	22	1	1 3/16
22	10	12	20	22	1	1 7/16
24	10	12	20	22	1	1 11/16
30	10	12	20	22	1 1/4	1 15/16
36	10	12	20	22	1 1/2	1 15/16

Aluminum Construction (thickness in inches)

Size	Housing	Curb Cap	Windband	Hood Panels	Shaft Diameter	
					Level 1	Level 2
9	0.125	0.125	0.051	0.051	3/4	1
10	0.125	0.125	0.051	0.051	3/4	1
12	0.125	0.125	0.051	0.051	3/4	1
13	0.125	0.125	0.051	0.051	3/4	1
16	0.125	0.125	0.051	0.051	1	1 3/16
18	0.125	0.125	0.051	0.051	1	1 3/16
22	0.125	0.125	0.051	0.051	1	1 7/16
24	0.125	0.125	0.051	0.051	1	1 11/16
30	0.19	0.125	0.051	0.051	1 1/4	1 15/16
36	0.19	0.125	0.051	0.051	1 1/2	1 15/16

MOTOR SELECTION

Motor frame size, enclosure type, and fan size limit the available standard motor selections. The accompanying charts show the motors available per unit size.

60 Cycle Motors

Size		HP	Single Speed						Two Speed	
			Open		TE		Exp. Resist		Open	
			115 208 230 1ph	*	115 208 230 1ph	*	115 208 230 1ph	*	115 208 230 1ph	**
L1	L2		1ph	3ph	1ph	3ph	1ph	3ph	1ph	3ph
9-16	9-13	1/4	+	+	+	+	+	+	+	
9-22	9-18	1/3	+	+	+	+	+	+	+	
9-24	9-22	1/2	+	+	+	+	+	+	+	+
9-30	9-30	3/4	+	+	+	+	+	+	+	+
10-36	9-36	1	+	+	+	+	+	+	+	+
12-36	9-36	1 1/2	+	+	+	+	+	+	+	+
16-36	9-36	2	+	+	+	+	+	+	+	+
16-36	12-36	3	+	+	+	+	+	+	+	+
24-36	16-36	5	+ X	+	+ X	+	+	+	+	+
30-36	22-36	7 1/2		+		+		+		+
36	24-36	10		+		+		+		+
-	30-36	15		+		+		+		+
-	36	20		+		+		+		+

+ Indicates available motors X Motors only available in 208 or 230v.
 * 1 speed 3 phase motors avail. in 200 or 208-230/460. Motors 1/2 hp and larger are avail in 575v.
 ** 2 speed 3 phase specify 1 voltage only (200, 208, 230 or 460v). For 575v consult local representative.

1800 RPM Motors

HP	Single Speed								2 SP 2 WDG		
	Open			TE		Explosion Resistant		High Efficiency		Open	
	115V 1PH	230V 1PH	*	115V 230V 1PH	*	115V 230V 1PH	*	230V 460V 3PH	230V 460V 3PH	115V 230V 1PH	**
1/4	48	48	48	48	48	48	48			48	
1/3	48	48	56	56	56	56	56			56	
1/2	56	56	56	56	56	56	56			56	
3/4	56	56	56	56	56	56	56			56	
1	56	56	143T	56	143T		56	143T	143T		56
1 1/2	145T	145T	145T	145T	145T		145T	145T	145T		56
2	182T	182T	145T	182T	145T		145T	145T	145T		182T
3			182T		182T		182T	182T	182T		184T
5			184T		184T		184T	184T	184T		215T
7.5			213T		213T		213T	213T	213T		254T
10			215T		215T		215T	215T	215T		256T
15			254T		254T		254T	254T	254T		256T
20			256T		256T		256T	256T	256T		284T

English/Metric Conversions

CATEGORY	ENGLISH UNIT	METRIC UNIT	CONVERSION FACTOR*
Air Flow Volume	CFM (Ft ³ / min)	m ³ / sec	0.00047195
		m ³ / min	0.028317
		m ³ / hr	1.6990
		l / sec	0.47195
		l / min	28.317
Pressure	Inches W.G.	Pascals (Pa)	248.36
Power	H.P.	Watt	745.7
		Kilowatt (kW)	0.7457
Temperature	Fahrenheit (°F)	Celsius (°C)	(°F - 32) (5/9)
Tip Speed & Velocity	Ft / Min	(m / sec)	0.00508
Fan Speed	rpm	rps	0.016
Dimensions	in	mm	25.4
		cm	2.54
	Ft	m	0.3048

* To obtain metric units, multiply the english units by the conversion factor.
 Note: The Greenheck Computer Aided Product Selection program (CAPS) provides conversions for all of these metric and english units automatically.

50 Cycle Motors

Size		HP	Single Speed					
			Open		TE		Exp. Resist	
			115 208 230 1ph		115 208 230 1ph		115 208 230 1ph	
L1	L2		1ph	3ph	1ph	3ph	1ph	3ph
9-22	9-18	1/4	+	+	+	+	+	+
9-24	9-22	1/3	+	+	+	+	+	+
9-30	9-30	1/2	+	+	+	+	+	+
10-36	9-36	3/4	+	+	+	+	+	+
12-36	9-36	1	+	+	+	+	+	+
16-36	9-36	1 1/2	+	+	+	+	+	+
16-36	12-36	2	+	+	+	+	+	+
24-36	16-36	3	+ X	+	+ X	+	+	+
30-36	22-36	5		+		+		+
36	24-36	7 1/2		+		+		+
-	30-36	10		+		+		+
-	36	15		+		+		+

+ Indicates available motors
 X available in 220/50/1 only.
 Open 1ph 110/220/50/1 Class B 40°C AMB
 3ph 220/50/3, 190/380/50/3, 415/50/3 Class B 40°C AMB
 TE 1ph 220/240/50/1 Class F 50°C AMB
 3ph 220/50/3, 190/380/50/3, 415/50/3 Class F 50°C AMB
 EXP 1ph 110/220/50/1 Class B 40°C AMB
 3ph 220/50/3, 190/380/50/3, 415/50/3 Class B 40°C AMB

CAPS

Computer Aided Product Selection Software

Greenheck's computer software for electronic fan selection is considered the best in the industry. It is designed to make fan selection fast, easy and accurate. CAPS eliminates manual calculations and allows you to compare up to six possible selections that meet the job requirements. Air performance is displayed in tables or fan curves. Dimensional drawings and data are shown on screen and can be printed out. Sound performance tables include eight octave band sound power, LwA, and dBA.

Once a fan is selected, it can be saved as part of a job, and the data can be stored on a disk and printed in the form of a fan schedule. Fan schedules may also be transferred directly to drawings with design packages such as AutoCAD.

How to Receive CAPS

To receive your copy of the CAPS software simply contact your nearest Greenheck representative and ask for the CAPS license agreement.

TYPICAL SPECIFICATION

Inline, upblast, or supply fans shall be of the tubular centrifugal type with backward inclined wheels.

The housing shall be constructed of continuously welded heavy gauge steel to minimize air leakage.

The housing and bearing support shall be constructed of structural steel members to prevent vibration and rigidly support the shaft and bearings.

The wheel shall be of the non-overloading backward inclined centrifugal type with aluminum construction. Wheel shall be statically and dynamically balanced. The wheel cone and fan inlet cone shall be carefully matched and shall have precise running tolerances for maximum performance and operating efficiency.

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.

Bearings shall be heavy duty grease lubricated and self-aligning. Bearings shall be selected for a basic rating fatigue life L (10) of 80,000 hours at maximum operating speed for each level of construction.

Inline tubular centrifugal fans shall bear the AMCA Certified Ratings Seals for both sound and air performance.

TCBRU fans shall meet the following additional requirements:

Curb cap shall be constructed of painted steel and welded to the fan housing. Windbands shall be constructed of heavy gauge painted steel with reinforced edges and bolted seams. Butterfly damper to be constructed of aluminum.

TCBRS fans shall meet the following additional requirements:

Curb cap shall be constructed of painted steel and welded to the fan housing. Hoods shall be inter-locking panel style for superior strength. Hood construction shall be painted steel. One-half inch galvanized mesh birdscreen shall be horizontally mounted in the intake perimeter of the hood.

Easy Access construction fans shall meet the following additional requirements:

Fan shall have an access panel large enough for the removal of the wheel, shaft, and bearings without disassembling the fan housing or removing the fan from the installation. Access panel shall be gasket lined to prevent air leakage from the fan housing.

Fans shall be TCB, TCBRU, and TCBRS as manufactured by Greenheck, Schofield, Wisconsin, USA.

WARRANTY

Greenheck warrants this equipment free from defects in material and workmanship for a period of one year from the purchase date. Any units or parts which prove defective during the warranty period will be replaced at our option when returned to our factory, transportation prepaid.

The motor is warranted by the motor manufacturer for a period of one year. Should the motor prove defective during this period, it should be returned to the nearest authorized motor service station. Greenheck will not be responsible for any installation or removal costs.

