Centrifugal Inline Fans

Models SQ and BSQ

Direct and Belt Drive



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March
2023

Centrifugal Square Inline Fans

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Model Comparison

Model	Location		Mounting					Airflow				Application							Drive Type		Impeller Type			Performance		Relative Cost
	Outdoor	Indoor	Roof Curb	Base/Floor	Hanging	Wall	Ceiling Mounted	Exhaust	Supply	Reversible	Recirculate	General/Clean Air	Contaminated Air	Spark Resistant	Grease (UL 762)	Smoke Control (UL)	High Wind (150 mph)	High Temp (above 200°F)	Belt	Direct	Centrifugal	Propeller/Axial	Mixed Flow	Maximum Volume (cfm)	Maximum Static Pressure (in. wg)	
SQ		✓		✓	✓			✓	✓		✓	✓		✓						✓	✓			5,000	2.5	$
BSQ		✓		✓	✓			✓	✓		✓	✓							✓		✓			27,700	4	$



Greenheck Fan Corporation certifies the model SQ and BSQ 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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c UL us LISTED

UL/cUL 705
Listed for Electrical
File no. E40001

UL electrical is optional and must be specified

Greenheck's model SQ and BSQ centrifugal inline fans feature a unique combination of installation flexibility, rugged construction, ease of service, high efficiency and low sound levels. These compact inline fans are the ideal selection for indoor clean air applications including intake, exhaust, return or make-up air systems where space is a prime consideration. The need for costly square-to-round transition pieces is eliminated reducing installation costs. The square housing design, compact size and straight-thru airflow also give the system designer the flexibility to mount SQ and BSQ fans in any configuration — horizontal, vertical or at any angle.

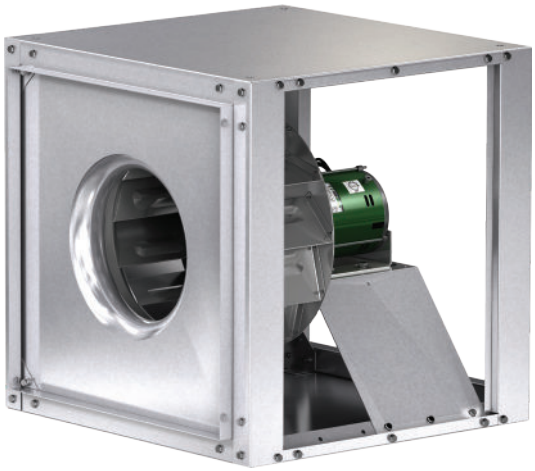
- Broadest performance in the industry, up to 4 in. wg and 27,700 cfm.
- Performance as cataloged is assured. All fan sizes are tested in our AMCA Accredited Laboratory, and all models are licensed to bear the AMCA Sound, Air and FEI seal.
- UL Listed for Electrical.
- These Greenheck products are subjected to extensive life testing to assure the fans will provide many years of reliable performance.

Over the years Greenheck has listened to your needs and input to remain the industry leader.

- Each fan is tested at the factory prior to shipping. The test includes a vibration check, adjusting RPM and maximum amp draw.
- Each fan displays a permanently stamped metal nameplate with complete model number, mark and unique serial number for future identification.
- Packaged-product is tested in accordance with ISTA (International Safe Transit Association) standards and procedures.

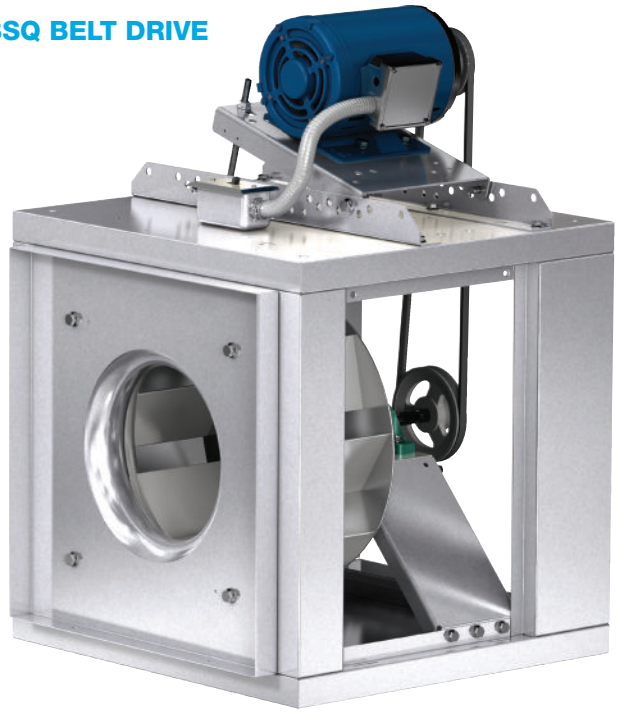
Turn to our inline fans to meet your requirements for applications in office buildings, schools and hospitals.

SQ DIRECT DRIVE



Shown with access panels, motor covers and bearing covers removed

BSQ BELT DRIVE



Housing Construction

The fan housing is constructed of rigid structural members and formed galvanized steel panels. (Aluminum construction is optional in SQ sizes 60-160 and in BSQ sizes 70-300).

Drive Frame

Constructed from heavy-gauge steel.

Wheel

Backward inclined, non-overloading centrifugal wheel is utilized to deliver maximum efficiency. Each wheel is statically and dynamically balanced.

Duct Collars

Inlet and discharge duct collars are provided for easy duct connection. The square design provides a larger discharge area than tubular centrifugal and vane axial fans; outlet velocities are reduced for quieter operation.

Motor

Permanently lubricated, sealed ball bearing motors are selected to provide years of trouble-free operation with minimal maintenance.

Bearings

100 percent factory-tested bearings are designed specifically for air handling applications with a minimum L10 life in excess of 100,000 hours (L50 average life in excess of 500,000 hours).

Drive Assembly

Drives are sized for a minimum of 150 percent of driven horsepower. Machined cast iron pulleys are factory set to the required RPM and adjustable for final system balancing. Belts are static free and oil resistant. Belt adjustment is accomplished by loosening fasteners, sliding the motor plate and retightening fasteners.

Fan Shaft

Fan shafts are precisely sized, ground and polished so the first critical speed is at least 25 percent over the maximum operating speed. Close tolerances where the shaft makes contact with bearings result in longer bearing life.

Disconnect Switch

A NEMA-1 disconnect switch is provided as standard. All wiring and electrical components comply with the National Electric Codes and materials are UL Listed. Other NEMA enclosure disconnect switches are optional.

Access Panels

The cabinet construction features two removable access panels permitting easy access to all interior components.

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Aluminum Construction

Aluminum construction is available for all direct drive sizes 60-160 and belt drive sizes 70-300. Some drive frame components may still be of steel construction to maintain structural integrity.

Inlet and Outlet Guards

Inlet and outlet guards provide protection for non-ducted applications. Guards are fabricated of welded wire on a galvanized steel frame. They are easily removed for maintenance and inspection.

Belt Drive Motor Cover and Belt Guard

For belt-driven fans, combination motor cover and belt guards constructed of galvanized steel are available for protection of motors, drives and personnel. Standard on units specified with UL.

Direct Drive Motor Cover

Formed, galvanized steel motor covers are available to isolate direct drive motors from the airstream. When motor covers are furnished, vents to the exterior of the fan are provided to ensure sufficient motor cooling.

Speed Controllers

Available for use with shaded pole and permanent split capacitor (PSC) motors on model SQ fans. They provide an economical means of system balancing with direct drive fans.



Insulated Housing

For noise reduction and condensation control, the interior of the fan housing can be lined with a 1-inch fiberglass duct liner. The optional motor cover can also be insulated.

The table depicts the radiated sound reduction that can be obtained in each octave band for the insulated housing and motor cover together.

Approximate Radiated Sound Attenuation (dB)								
Octave Band	1	2	3	4	5	6	7	8
Sizes 60 - 130	-2	-7	-4	-4	-6	-13	-13	-9
Sizes 140 - 420	-3	-2	-5	-4	-5	-5	-7	-8

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Backdraft Dampers

Gravity or motorized parallel blade dampers (model WD-330) are available for duct mounting. These dampers feature sturdy galvanized frames, aluminum blades with vinyl blade seals, and a balanced design for minimal resistance to airflow.



Control Dampers

Square, opposed blade volume control dampers (model VCD) are available for duct mounting. These dampers feature sturdy galvanized frames, and steel blades with optional blade and jamb seals. A balanced design results in minimal resistance to airflow.



Motor Starters

The fundamental function of a motor starter is to protect the motor from damage that can occur from overheating. With a Greenheck motor starter, you will be provided with the best motor protection available.

Specific model components may include; physical interface, overload protection, disconnect, magnetic contactor, NEMA-1 or NEMA-3R steel enclosures and pre-engineered easy system integration. For complete information on specific Greenheck Motor Starter models refer to greenheck.com, Products, Motor Starter page.



Wiring Pigtail

Allows direct hook-up to the power supply eliminating field wiring at the fan.

Coatings

A wide variety of coatings and colors are available. Greenheck coatings and resistance charts can be found in the Performance Coatings Commercial and Industrial Fans color chart and in our Coatings Application Guide.

PERMATECTOR™

Permatector™ is our standard coating. Typically used for applications that require corrosion resistance in indoor and outdoor environments. Color is RAL 7023 concrete grey.

HI-PRO POLYESTER

Hi-Pro Polyester is resistant to salt water, chemical fumes and moisture in more corrosive atmospheres. It has superior chemical resistance, excellent abrasion and outdoor UV protection. This coating has protective qualities that exceed Air Dry Heresite. Color RAL 7023 concrete grey is standard; choose from seven standard decorative colors or color match any color.



INDUSTRIAL EPOXY

Industrial Epoxy is a high performance epoxy with excellent chemical resistance in interior applications to a wide variety of chemicals including acids, caustics, solvents, and high moisture.

Filter Options

The filter box is designed to provide a compact and convenient clean air solution. Factory-assembled as a single unit, this fan eliminates the costly process of designing, fabricating and installing special remote filter box assemblies. Both the fan and filter section feature removable access panels on both sides to remove and replace filters, making fan maintenance simple and fast.



Model	Fan Size	Filter Box Weight^	Filter Size(s)	Filter Quantity
SQ Direct Drive	60, 70	40	10 x 12	1
	80, 90, 95	74	14 x 25	1
	97, 98, 99	80	14 x 25	1
	100	88	16 x 20	2
	120	114	16 x 25	2
	130 (HP)	120	20 x 20	2
	140 (HP)	174	20 x 25	2
	160 (HP)	246	20 x 20	4
BSQ Belt Drive	70, 80, 90	168	16 x 20	2
	100	169	16 x 20	2
	120	194	16 x 25	2
	130 (HP)	197	20 x 20	2
	140 (HP)	231	20 x 25	2
	160 (HP)	285	20 x 20	4
	180 (HP)	293	20 x 25	4
	200 (HP)	361	12 x 25	3
			16 x 25	3
	240 (HP)	496	20 x 25	4
			16 x 25	4
	300 (HP)	759	20 x 25	8
	360 (HP)	957	16 x 25	10
			20 x 25	5
	420	1185	16 x 25	5
			20 x 25	10

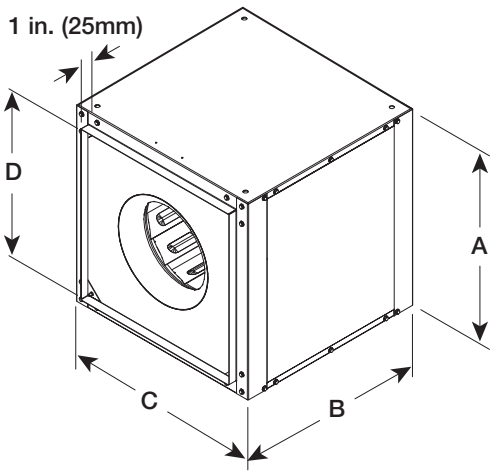
All dimensions in inches and weight is shown in pounds. ^Weight shown is standard galvanized construction and largest cataloged open drip proof motor.
Note: 24-inch side clearance is recommended for accessing and removing filters.

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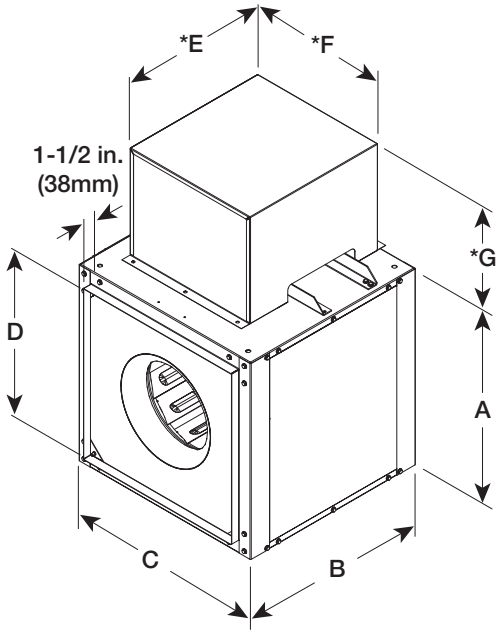
Dimensions

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SQ DIRECT DRIVE



BSQ BELT DRIVE

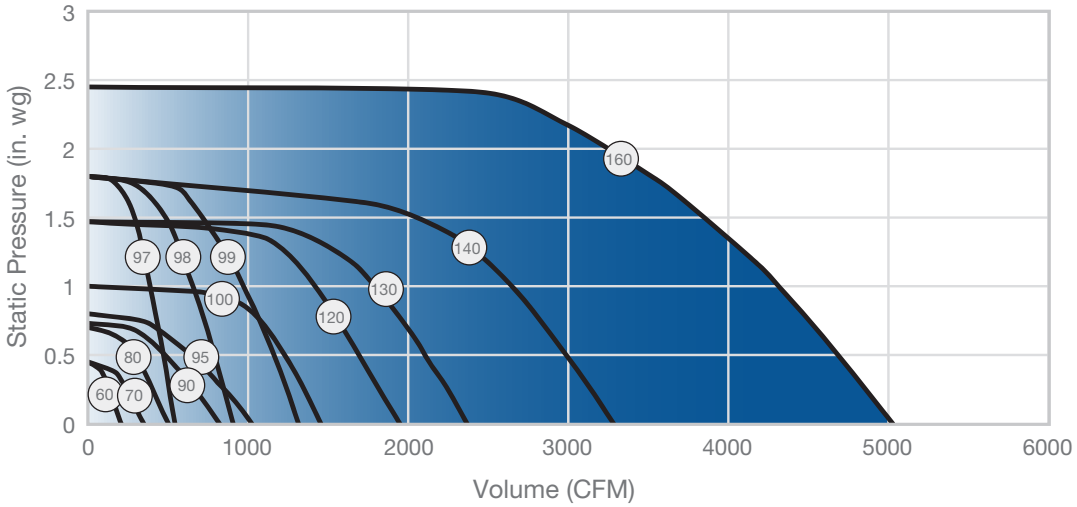


Model	Fan Size	A	B	C	D	*E	*F	*G	Damper Size	Max Fan Weight^
SQ Direct Drive	60, 70	12	13	12	8-7/8	-	-	-	9 x 9	26
	80, 90, 95	15	16	15	11-7/8	-	-	-	12 x 12	41
	97, 98, 99	15	21	15	11-7/8	-	-	-	12 x 12	49
	100	17	21	17	13-7/8	-	-	-	14 x 14	56
	120	19	21	19	15-7/8	-	-	-	16 x 16	67
	130 (HP)	21	21	21	17-7/8	-	-	-	18 x 18	67
	140 (HP)	23	22	23	19-7/8	-	-	-	20 x 20	104
	160 (HP)	26	26	26	22-7/8	-	-	-	23 x 23	160
BSQ Belt Drive	70, 80, 90	17-1/8	21	17-1/8	11-7/8	17-3/4	13	13-1/4	12 x 12	106
	100	17-1/8	21	17-1/8	13-7/8	17-3/4	13	13-1/4	14 x 14	107
	120	19-1/8	21	19-1/8	15-7/8	20	17	13-1/4	16 x 16	124
	130 (HP)	21-1/8	21	21-1/8	17-7/8	20	17	13-1/4	18 x 18	131
	140 (HP)	23-1/8	22	23-1/8	19-7/8	20	17	13-1/4	20 x 20	146
	160 (HP)	26-1/8	26	26-1/8	22-7/8	20	17	13-1/4	23 x 23	188
	180 (HP)	27-1/8	28	27-1/8	23-7/8	20	17	13-1/4	24 x 24	195
	200 (HP)	31-1/8	32	31-1/8	27-7/8	30	20	16	28 x 28	246
	240 (HP)	38-1/8	34	38-1/8	34-7/8	30	20	16	35 x 35	350
	300 (HP)	46	38	46	41-7/8	34	22	18	42 x 42	537
	360 (HP)	52	42	52	47-7/8	34	22	18	48 x 48	686
	420	58	50	58	53-7/8	34	22	18	54 x 54	789

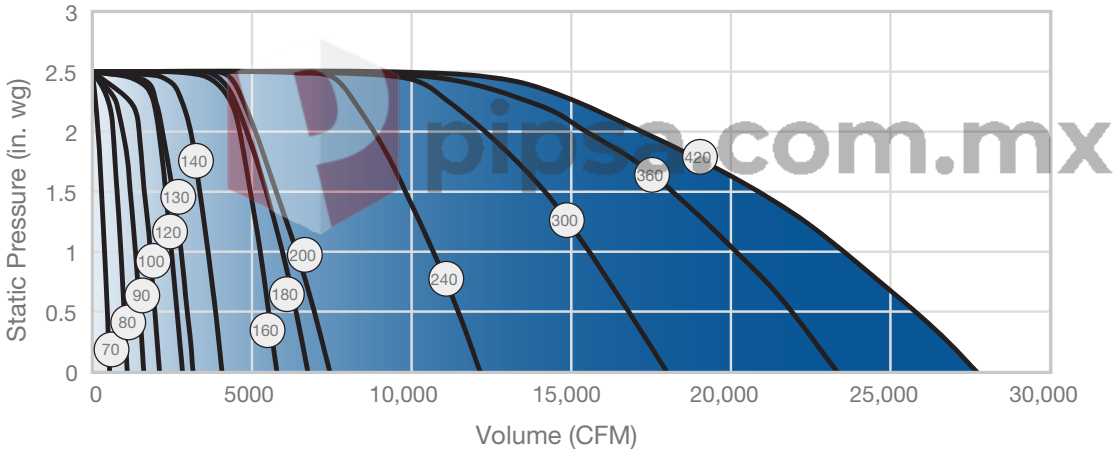
All dimensions in inches and weight is shown in pounds. *Motor cover is optional. Size may be greater depending on motor. ^Weight shown is standard galvanized construction and largest cataloged open drip proof motor.

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SQ DIRECT DRIVE

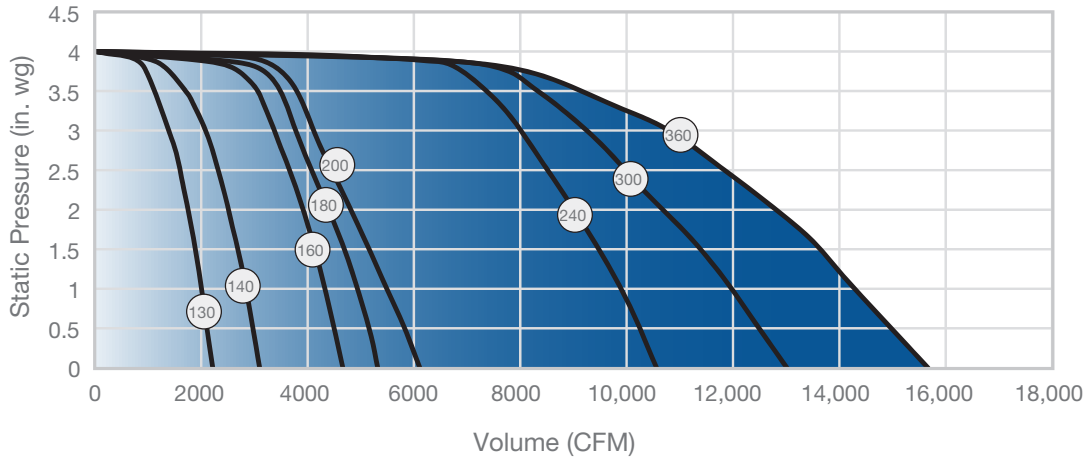


BSQ BELT DRIVE

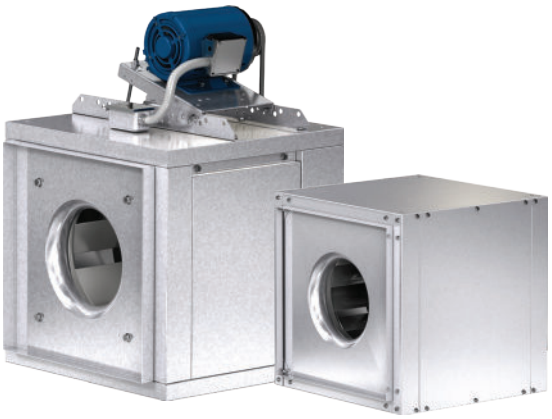


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BSQ-HP BELT DRIVE



Fan Size



MODEL NUMBER CODE

The model number system is designed to completely identify the fan. The correct code letters must be specified to designate belt or direct drive. The remainder of the model number is determined by the size and performance.

BSQ - 120 HP - VG

VG = Vari-Green® Motor
(Direct Drive only)

MODEL CONFIGURATION
BSQ - Belt Drive
SQ - Direct Drive

FAN SIZE
60 through 420

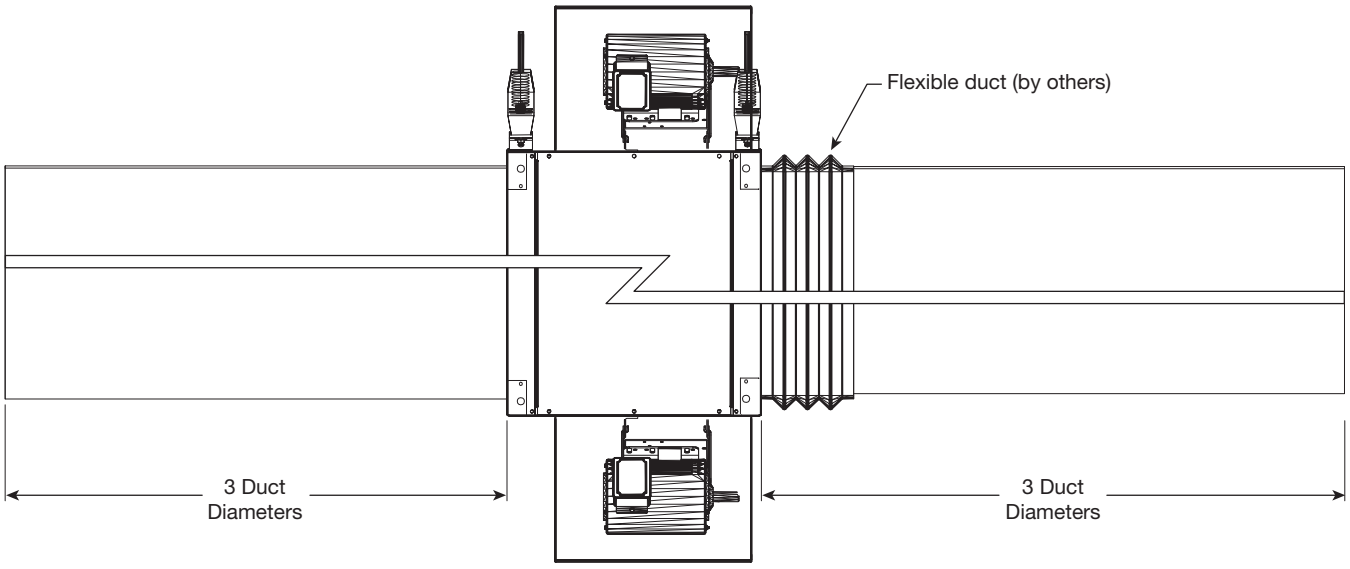
PRESSURE LEVEL *(Belt Drive Only)*
HP - High Pressure Wheel

TYPICAL INSTALLATION

Models SQ and BSQ ducted inline fans are designed for the exhaust, supply or recirculation of air in a building. Typical installation requires ductwork on the inlet and outlet side of the fan. A minimum of three duct diameters is required on the inlet and outlet of the fan to minimize system effect losses. See the diagram below for a typical installation.
Installations can include flexible duct connections (by others) on either the inlet or outlet side of the fan or both. The motor is rigidly mounted and can be oriented in any direction (top, bottom, side).

The model BSQ ducted inline fan must be installed with the motor accessible for maintenance and inspection. External isolators are recommended, hanging (shown below) or base mounted.
Installation must meet all local governing codes and the NEC.

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Discharge Options

The side discharge option helps to reduce system effect. It will increase performance and reduce installation labor. The most notable is reducing system effects. Note: The Figure 1 example shows the air being discharged into the corner. It will take several duct lengths before the airflow becomes laminar or smooth again after making the turn.

In Figure 2, the fan is placed in the corner using a side discharge. In this configuration the airflow pattern at discharge is smooth and supports a more predictable system. Remember the duct length on the discharge side should be approximately two to three wheel diameters to achieve catalog performance.

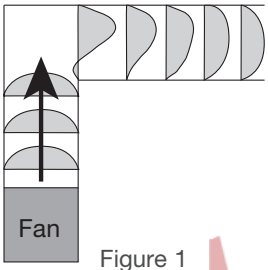


Figure 1

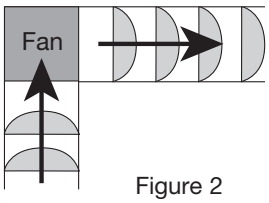


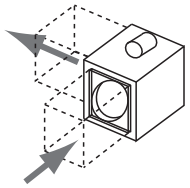
Figure 2

Discharge Configuration

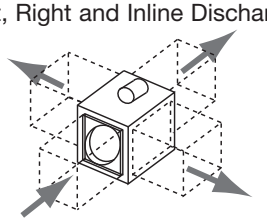
Fan performance will change with different discharge positions. Catalog data is based on an inline discharge. Right side discharge will give you 108% of cataloged performance and left side will give you 109% of cataloged performance. Use Figure 3 to locate the orientation to fit your application.

Figures 4 and 5 illustrate the proper side discharge definitions. Refer to Greenheck's CAPS® (Computer Aided Product Selection) program or consult factory for performance modifications.

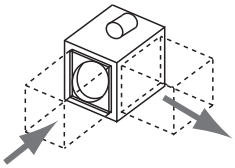
Left Discharge



Left, Right and Inline Discharge



Right Discharge



Left and Right Discharge

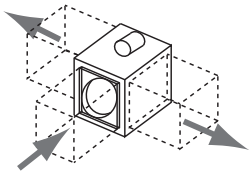


Figure 3

Side Discharge Duct Openings

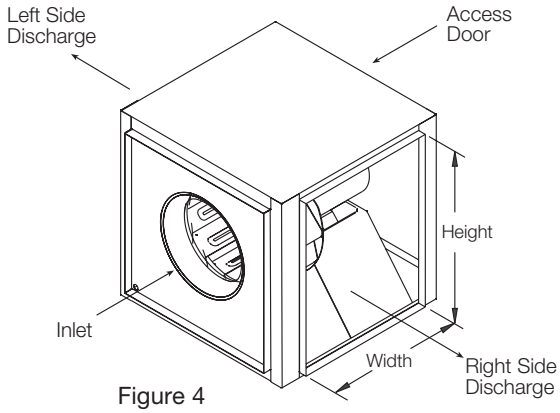


Figure 4

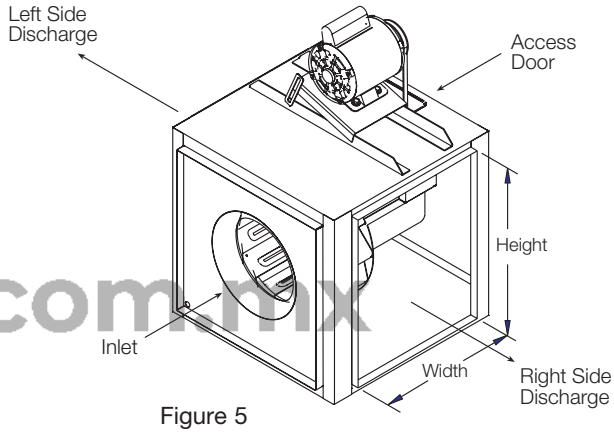


Figure 5

Model	Fan Size	Width	Height
SQ Direct Drive	60, 70	9-7/8	8-7/8
	80, 90, 95	12-7/8	11-7/8
	97, 98, 99	13-7/8	11-7/8
	100	13-7/8	13-7/8
	120	15-7/8	15-7/8
	130 (HP)	17-7/8	17-7/8
	140 (HP)	19-7/8	19-7/8
	160 (HP)	22-7/8	22-7/8
BSQ Belt Drive	70, 80, 90, 100	12-1/2	13-7/8
	120	12-1/2	15-7/8
	130 (HP)	12-1/2	17-7/8
	140 (HP)	13-1/2	19-7/8
	160 (HP)	17-1/2	22-7/8
	180 (HP)	19-1/2	23-7/8
	200 (HP)	23-1/2	27-7/8
	240 (HP)	25-1/2	43-7/8
	300 (HP)	31-7/8	41-7/8
	360 (HP)	32-7/8	37-7/8
	420	34-7/8	43-7/8

All dimensions in inches.

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Mounting Options

All fan models can be mounted horizontally, vertically or at an angle. For ease of installation, knockouts are provided at each location where mounting brackets are shown in Figures 6, 7 and 8. Optional brackets are universally adjustable to mount in any of these locations.

With either a hanging or base mount the motor may be located on either side. The base mount allows top access panels only.

With a hanging mount, the motor may be located on either top or bottom. The base mount allows top motor location only. Both options provide access panels on two sides.

Mounting brackets are turned 90° for vertical mounting. Access panels are located on the two sides adjacent to the motor.

Model	Fan Size	A	B	C	D	E	F	G
SQ Direct Drive	60, 70	10-5/8	16-3/4	14-5/8	8-7/8	19-7/8	6-7/8	Hanging rails not included. Supplied by others.
	80, 90, 95	13-1/4	19-3/4	15-1/8	9-3/8	43	27-3/8	
	97, 98, 99	18-5/8	19-3/4	15-1/8	9-3/8	48-3/8	27-3/8	
	100	18-5/8	21-3/4	19-5/8	13-7/8	43-3/4	22-3/4	
	120	18-5/8	23-3/4	21-5/8	15-7/8	49-1/8	28-1/8	
	130 (HP)	18-5/8	25-3/4	23-5/8	17-7/8	44	23	
	140 (HP)	19-5/8	27-3/4	25-5/8	19-7/8	50	28	
	160 (HP)	23-1/2	31	28-3/4	22-7/8	49-1/2	23-5/8	
BSQ Belt Drive	70, 80, 90, 100	18	21-13/16	19-7/8	14-1/8	50-7/8	29-7/8	Hanging rails not included. Supplied by others.
	120	18	23-13/16	21-7/8	16-1/8	55-3/4	34-3/4	
	130 (HP)	18	25-13/16	23-7/8	18-1/8	50-1/4	29-1/4	
	140 (HP)	19	27-13/16	25-7/8	20-1/8	56	34	
	160 (HP)	23	31-3/16	29	23-1/8	55-3/4	29-3/4	
	180 (HP)	25	32-3/16	30	24-1/8	57-3/4	29-3/4	
	200 (HP)	29	36-3/16	34	28-1/8	66-3/8	34-3/8	
	240 (HP)	31	43-3/16	41	35-1/8	68-1/2	34-1/2	
	300 (HP)	35	51	46-3/4	40-7/8	69-1/8	31-3/8	
	360 (HP)	39-3/8	57	52-5/8	46-3/4	76-5/8	34-3/4	
	420	47	63	58-5/8	52-3/4	90-1/4	40-5/8	

All dimensions in inches.

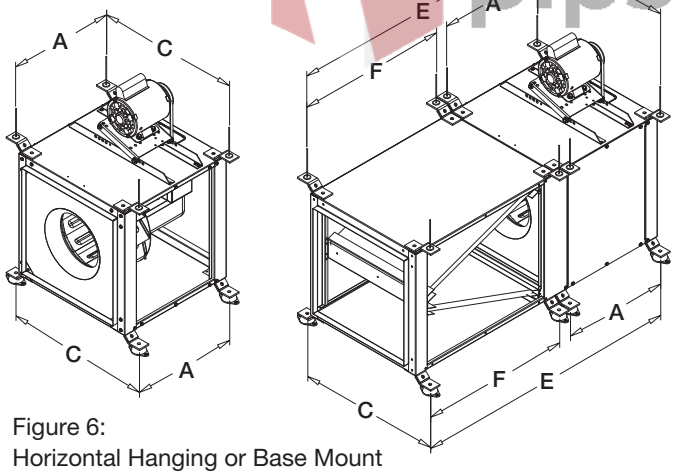
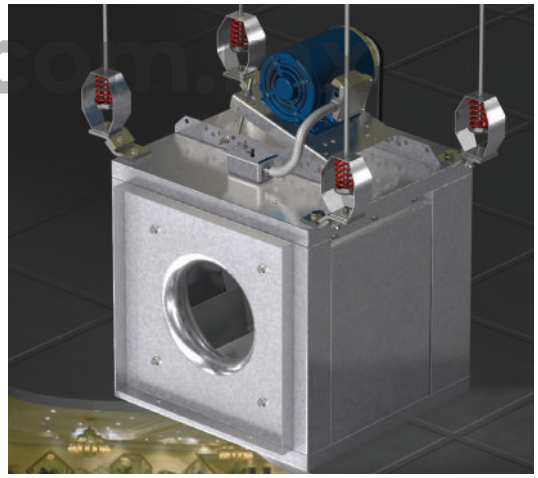


Figure 6:
Horizontal Hanging or Base Mount



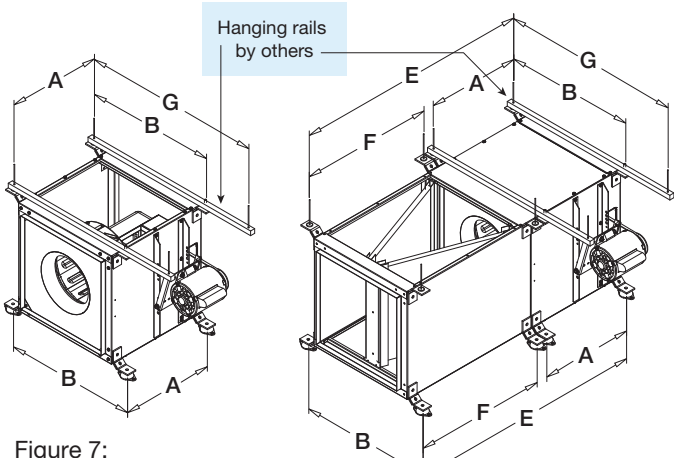


Figure 7:
Horizontal Hanging or Base Mount

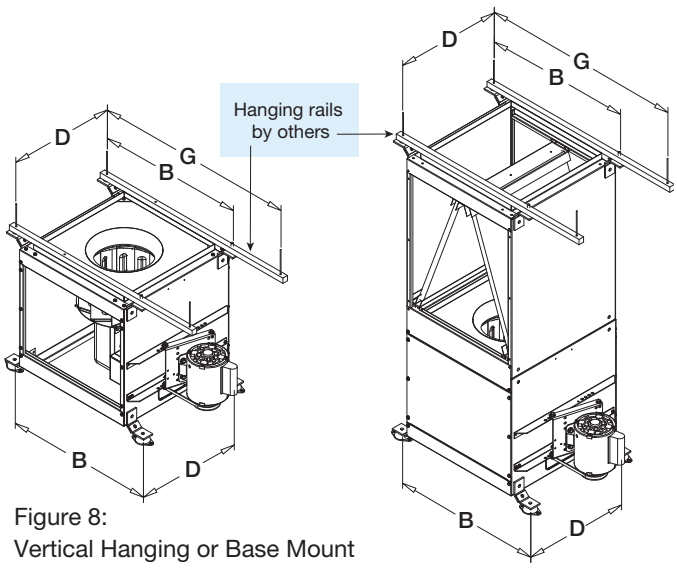


Figure 8:
Vertical Hanging or Base Mount

Base Mount or Hanging Isolators

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Building Value in Air.

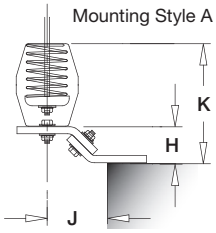
Complete isolation kits are available with either neoprene or spring isolators and are sized to match the weight of the specified fan size. The base isolator support brackets are designed to permit mounting of the fan with the motor located on top or either side. The hanging isolator support brackets are designed to permit mounting of the fan with the motor located on top, bottom or side.

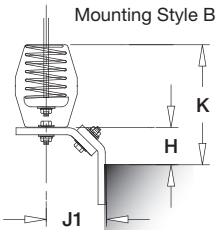
Note: Hanging rods to be supplied by others.

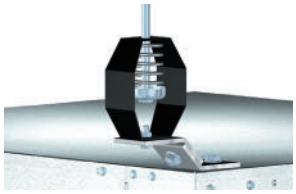
Model	Fan Size	H	I	J	J1	K	L
SQ Direct Drive	60, 70, 80, 90, 95, 97, 98, 99, 100, 120, 130 (HP), 140 (HP)	1-3/8	5-1/2	1-3/8	2-3/8	6-3/4	2-5/16
	160 (HP)	1-3/8	5-1/2	1-3/8	2-1/2	6-3/4	2-5/8
BSQ Belt Drive	70, 80, 90, 100, 120, 130 (HP), 140 (HP)	1-3/8	5-1/2	1-3/8	2-3/8	6-3/4	2-5/8
	160 (HP), 180 (HP), 200 (HP), 240 (HP), 300 (HP), 360 (HP), 420	1-3/8	5-1/2	1-3/8	2-1/2	6-3/4	2-5/8

All dimensions in inches.

Hanging Spring

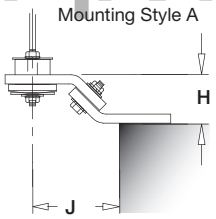


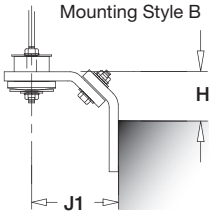


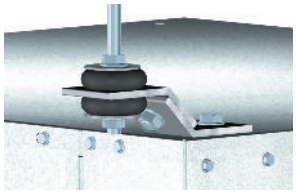


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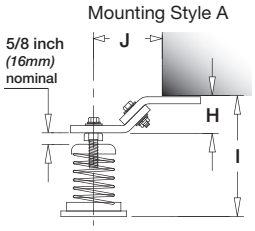
Hanging Neoprene

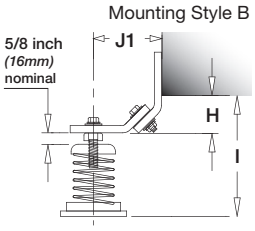






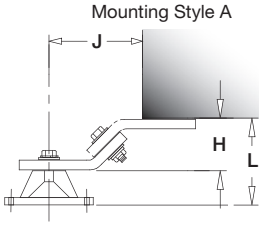
Standing Spring

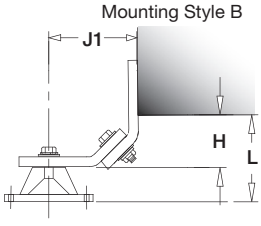






Standing Neoprene







Vari-Green® Options

Model SQ (direct drive) is available with Greenheck's Vari-Green® technology. Vari-Green products are design for efficiency, controllability and low maintenance.



Motors

The Greenheck Vari-Green motor is an electronically commutated (EC) motor that operates on single or three phase AC power input and internally converts it to DC power providing better speed control capabilities (up to an 80% turndown) and higher efficiencies than standard motors.

The Vari-Green motor blends technology, controllability and energy efficiency in a low maintenance package that has changed the way the industry designs, specifies and operates air movement equipment. Depending on power rating, Vari-Green motors are available in both single and three phase with either a dial-mounted potentiometer (speed control) or wired to accept a 0-10 VDC control signal from an external source.

Controls

For expanded controllability, Greenheck offers many different solutions to fit any need. Controls are designed specifically for Vari-Green motors. These controls are available for applications requiring manual operation or demand-controlled ventilation (DCV). Applications utilizing DCV controls provide only the desired amount of ventilation, delivering building owners savings on their energy bills.



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Manual Controls

- Dial on Fan
- Remote Dial
- Touch Remote

Demand Controlled Ventilation

- Hand/Off/Auto (HOA)
- Constant Airflow
- Constant Pressure
- Air Quality - Volatile Organic Compound (VOC)
- Air Quality - Temperature/Humidity
- 0-10 VDC Signal from Building Management System (BMS)



Our Commitment

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

Specific Greenheck product warranties are located on greenheck.com within the product area tabs and in the Library under Warranties.

GREENHECK
Building Value in Air.

P.O. Box 410 • Schofield, WI 54476-0410 • Phone (715) 359-6171 • greenheck.com

00.F&V.1016 R10 3-2023
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