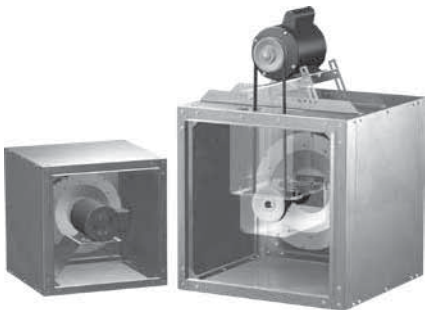
GREENHECK
Building Value in Air.

Document 483064
Models SQ-M and BSQ-M
Centrifugal Inline Fans

Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with these instructions will result in voiding of the product warranty and may result in personal injury and/or property damage.

Model SQ-M Direct Drive



Model SQ-M is a direct drive centrifugal inline exhaust fan. These fans are specifically designed for inline applications. Performance capabilities range up to 8,500 m^3/hr *(5,000 cfm)* and up to 498 Pa *(2.0 in. wg)* of static pressure. SQ-M fans are available in eight sizes with nominal wheel diameter ranging from 211 to 406 mm *(8 to 16 inches)* (70 to 160 unit sizes). Each fan shall bear a permanently affixed manufacturers engraved metal nameplate containing the model number and individual serial number.

Model BSQ-M Belt Drive

Model BSQ-M is a belt drive centrifugal inline exhaust fan. These fans are specifically designed for inline applications. Performance capabilities range up to 46,200 m^3/hr *(27,200 cfm)* and up to 996 Pa *(4.0 in. wg)* of static pressure. BSQ-M fans are available in twenty-two sizes with nominal wheel diameter ranging from 284 to 1067 mm *(11 to 42 inches)* (70 to 420 unit sizes), including High Pressure (HP). Each fan shall bear a permanently affixed manufacturers engraved metal nameplate containing the model number and individual serial number.

General Safety Information

Only qualified personnel should install this fan. Personnel should have a clear understanding of these instructions and should be aware of general safety precautions. Improper installation can result in electric shock, possible injury due to coming in contact with moving parts, as well as other potential hazards. Other considerations may be required if seismic activity is present. If more information is needed, contact a licensed professional engineer before moving forward.

1. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the National Fire Protection Agency (NFPA), where applicable.
2. The rotation of the wheel is critical. It must be free to rotate without striking or rubbing any stationary objects.
3. Motor must be securely and adequately grounded.
4. Do not spin fan wheel faster than max cataloged fan RPM. Adjustments to fan speed significantly affects motor load. If the fan RPM is changed, the motor current should be checked to make sure it is not exceeding the motor nameplate amps.
5. Do not allow the power cable to kink or come in contact with oil, grease, hot surfaces or chemicals. Replace cord immediately if damaged.
6. Verify that the power source is compatible with the equipment.
7. Never open access doors to a duct while the fan is running.

DANGER

Always disconnect, lock and tag power source before installing or servicing. Failure to disconnect power source can result in fire, shock or serious injury.

CAUTION

When servicing the fan, motor may be hot enough to cause pain or injury. Allow motor to cool before servicing.

CAUTION

Precaution should be taken in explosive atmospheres.

Table of Contents

Receiving

Upon receiving the product check to ensure all items are accounted for by referencing the delivery receipt or packing list. Inspect each crate or carton for shipping damage before accepting delivery. Alert the carrier of any damage detected. The customer will make a notation of damage (or shortage of items) on the delivery receipt and all copies of the bill of lading which is countersigned by the delivering carrier. If damaged, immediately contact your local representative. Any physical damage to the unit after acceptance is not the responsibility of the manufacturer.

Unpacking

Verify that all required parts and the correct quantity of each item have been received. If any items are missing, report shortages to your local representative to arrange for obtaining missing parts. Sometimes it is not possible that all items for the unit be shipped together due to availability of transportation and truck space. Confirmation of shipment(s) must be limited to only items on the bill of lading.

Handling

Move fan to desired location and determine position of access panels, discharge and motor. Make sure the inlet and outlet have at least 2½ times the wheel diameter (duct diameter) before any obstructions like an elbow or transition. Attach the fan to a suitable framework as specified; hanging or base vibration isolators are recommended. See the SQ-M & BSQ-M Fan Dimensions table on page 3 for physical dimensions, utilizing Figures 1 and 2. Mounting dimensions and vibration isolator centerline information is provided on pages 4 and 5. The motor's amperage and voltage ratings must be checked for compatibility to supply voltage prior to final electrical connection. Electrical lead-in wires are then connected to the factory supplied safety disconnect switch. All wiring must conform to local and national codes.

Fan Storage

Fans are protected against damage during shipment. If the unit cannot be installed and operated immediately, precautions need to be taken to prevent deterioration of the unit during storage. The user assumes responsibility of the fan and accessories while in storage. The manufacturer will not be responsible for damage during storage. These suggestions are provided solely as a convenience to the user.

Indoor Storage: The ideal environment for the storage of fans and accessories is indoors, above grade, in a low humidity atmosphere which is sealed to prevent the entry of blowing dust, rain or snow. Temperatures should be evenly maintained between 30° to 110°F *(-1° to 43°C)* (wide temperature swings may cause condensation and "sweating" of metal parts). All accessories must be stored indoors in a clean, dry atmosphere.

Remove any accumulations of dirt, water, ice or snow and wipe dry before moving to indoor storage. To avoid "sweating" of metal parts allow cold parts to reach room temperature. To dry parts and packages, use a portable electric heater to get rid of any moisture buildup. Leave coverings loose to permit air circulation and to allow for periodic inspection.

The unit should be stored at least 3½ inches *(89 mm)* off the floor on wooden blocks covered with moisture proof paper or polyethylene sheathing. Aisles between parts and along all walls should be provided to permit air circulation and space for inspection.

Outdoor Storage: Fans designed for outdoor applications may be stored outdoors, if absolutely necessary. Roads or aisles for portable cranes and hauling equipment are needed.
The fan should be placed on a level surface to prevent water from leaking into the fan. The fan should be elevated on an adequate number of wooden blocks so that it is above water and snow levels and has enough blocking to prevent it from settling into soft ground. Locate parts far enough apart to permit air circulation, sunlight and space for periodic inspection. To minimize water accumulation, place all fan parts on blocking supports so that rain water will run off.

Do not cover parts with plastic film or tarps as these cause condensation of moisture from the air passing through heating and cooling cycles.

Fan wheels should be blocked to prevent spinning caused by strong winds.

Inspection and Maintenance During Storage

While in storage, inspect fans once per month. Keep a record of inspection and maintenance performed.

If moisture or dirt accumulations are found on parts, the source should be located and eliminated. At each inspection, rotate the wheel by hand ten to fifteen revolutions to distribute lubricant on motor. If paint deterioration begins, consideration should be given to touch-up or repainting. Fans with special coatings may require special techniques for touch-up or repair.

Machined parts coated with rust preventive should be restored to good condition promptly if signs of rust occur. Immediately remove the original rust preventive coating with petroleum solvent and clean with lint-free cloths. Polish any remaining rust from surface with crocus cloth or fine emery paper and oil. Do not destroy the continuity of the surfaces. Thoroughly wipe clean with Tectyl® 506 (Ashland Inc.) or the equivalent. For hard to reach internal surfaces or for occasional use, consider using Tectyl® 511M Rust Preventive, WD-40® or the equivalent.

Removing From Storage

As fans are removed from storage to be installed in their final location, they should be protected and maintained in a similar fashion until the fan equipment goes into operation.

Dimensional Data

Figure 1:
SQ-M Dimensions

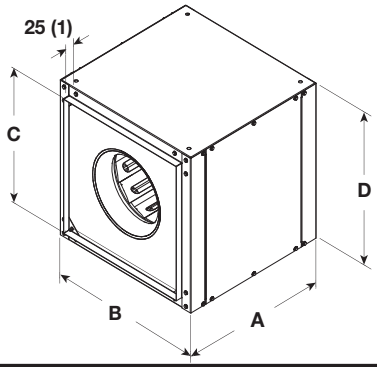
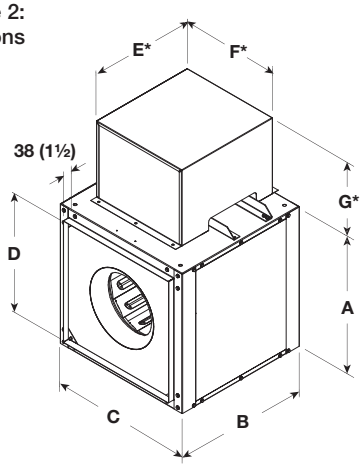


Figure 2:
BSQ-M Dimensions



Model SQ-M Fan Dimensions

Size	A	B	C	D	Outlet Velocity	Unit Weight*	Housing Material	Damper Size
70	305 *(12)*	330 *(13)*	305 *(12)*	225 *(8⅞)*	1.828 x CFM	12 *(26)*	20 ga	229 x 229 *(9 x 9)*
80-90	381 *(15)*	406 *(16)*	381 *(15)*	302 *(11⅞)*	1.021 x CFM	19 *(41)*	20 ga	305 x 305 *(12 x 12)*
100	432 *(17)*	533 *(21)*	432 *(17)*	352 *(13⅞)*	0.748 x CFM	25 *(56)*	20 ga	356 x 356 *(14 x 14)*
120	483 *(19)*	533 *(21)*	483 *(19)*	403 *(15⅞)*	0.571 x CFM	30 *(67)*	20 ga	406 x 406 *(16 x 16)*
130	533 *(21)*	533 *(21)*	533 *(21)*	454 *(17⅞)*	0.451 x CFM	30 *(67)*	20 ga	457 x 457 *(18 x 18)*
140	584 *(23)*	559 *(22)*	584 *(23)*	505 *(19⅞)*	0.364 x CFM	47 *(104)*	18 ga	508 x 508 *(20 x 20)*
160	660 *(26)*	660 *(26)*	660 *(26)*	581 *(22⅞)*	0.275 X CFM	73 *(160)*	18 ga	584 x 584 *(23 x 23)*

All dimensions are in millimeters (inches) and weight is shown in kilograms (pounds).
*Weight shown is largest cataloged open drip proof motor.

Model BSQ-M Fan Dimensions

Size	A	B	C	D	E*	F*	G*	Outlet Velocity	Unit Weight**	Housing Material	Damper Size
70, 80, 90	435 *(17⅛)*	533 *(21)*	435 *(17⅛)*	302 *(11⅞)*	451 *(17¾)*	330 *(13)*	337 *(13¼)*	1.0212 x CFM	48 *(106)*	20 ga	305 x 305 *(12 x 12)*
100	435 *(17⅛)*	533 *(21)*	435 *(17⅛)*	352 *(13⅞)*	451 *(17¾)*	330 *(13)*	337 *(13¼)*	0.7617 x CFM	49 *(107)*	20 ga	356 x 356 *(14 x 14)*
120	486 *(19⅛)*	533 *(21)*	486 *(19⅛)*	403 *(15⅞)*	508 *(20)*	432 *(17)*	337 *(13¼)*	0.5805 x CFM	56 *(124)*	20 ga	406 x 406 *(16 x 16)*
130, 130HP	537 *(21⅛)*	533 *(21)*	537 *(21⅛)*	454 *(17⅞)*	508 *(20)*	432 *(17)*	337 *(13¼))*	0.4571 x CFM	59 *(131)*	20 ga	457 x 457 *(18 x 18)*
140, 140HP	587 *(23⅛)*	559 *(22)*	587 *(23⅛)*	505 *(19⅞)*	508 *(20)*	432 *(17)*	337 *(13¼)*	0.3692 x CFM	66 *(146)*	20 ga	508 x 508 *(20 x 20)*
160, 160HP	664 *(26⅛)*	660 *(26)*	664 *(26⅛)*	581 *(22⅞)*	508 *(20)*	432 *(17)*	337 *(13¼)*	0.2782 x CFM	85 *(188)*	18 ga	584 x 584 *(23 x 23)*
180, 180HP	689 *(27⅛)*	711 *(28)*	689 *(27⅛)*	606 *(23⅞)*	508 *(20)*	432 *(17)*	337 *(13¼)*	0.2553 x CFM	88 *(195)*	18 ga	610 x 610 *(24 x 24)*
200, 200HP	791 *(31⅛)*	813 *(32)*	791 *(31⅛)*	708 *(27⅞)*	762 *(30)*	508 *(20)*	406 *(16)*	0.1870 x CFM	111 *(246)*	18 ga	711 x 711 *(28 x 28)*
240, 240HP	968 *(38⅛)*	864 *(34)*	968 *(38⅛)*	886 *(34⅞)*	762 *(30)*	508 *(20)*	406 *(16)*	0.1192 x CFM	159 *(350)*	18 ga	889 x 889 *(35 x 35)*
300, 300HP	1168 *(46)*	965 *(38)*	1168 *(46)*	1064 *(41⅞)*	864 *(34)*	559 *(22)*	457 *(18)*	0.0826 x CFM	244 *(537)*	16 ga	1067 x 1067 *(42 x 42)*
360, 360HP	1321 *(52)*	1067 *(42)*	1321 *(52)*	1216 *(47⅞)*	864 *(34)*	559 *(22)*	457 *(18)*	0.0632 x CFM	311 *(686)*	16 ga	1219 x 1219 *(48 x 48)*
420	1473 *(58)*	1270 *(50)*	1473 *(58)*	1368 *(53⅞)*	864 *(34)*	559 *(22)*	457 *(18)*	0.0496 x CFM	358 *(789)*	16 ga	1372 x 1372 *(54 x 54)*

All dimensions are in millimeters (inches). and weight is shown in kilograms (pounds).
*Motor cover is optional. Dimensions may vary with motor size. **Weight shown is largest cataloged open drip proof motor.

Mounting: SQ-M /BSQ-M

All SQ-M and BSQ-M fan models can be mounted horizontally or vertically. For ease of installation, knockouts are provided at each location where mounting brackets are shown in Figures 3, 4 and 5. Optional brackets are universally adjustable to mount in any of these locations.

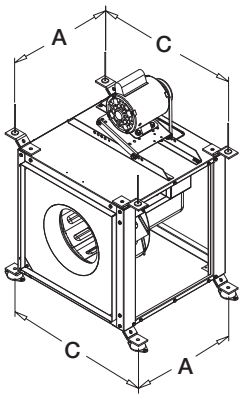


Figure 3
Horizontal Hanging or Base Mount

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

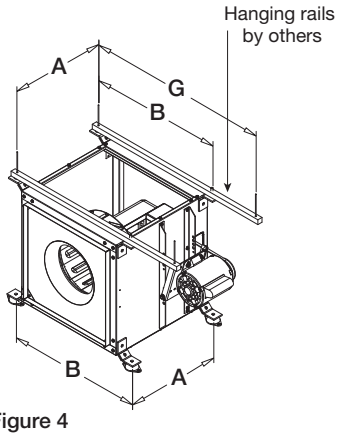


Figure 4
Horizontal Hanging or Base Mount

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.

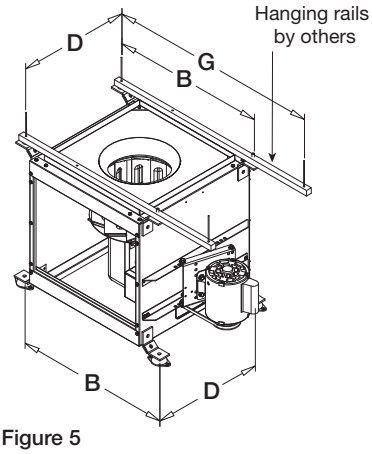


Figure 5
Vertical Hanging or Base Mount

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

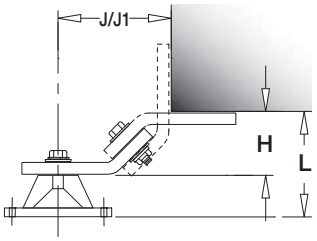
Mounting Dimensional Data

Model	A		B		C		D		G
SQ-M 70	270	*(10⅝)*	432	*(17)*	400	*(15¾)*	225	*(8⅞)*	Hanging rails not included. Supplied by others.
SQ-M 80-90	337	*(13¼)*	508	*(20)*	476	*(18¾)*	302	*(11⅞)*	
BSQ-M 70-90	473	*(18⅝)*	511	*(20⅛)*	476	*(18¾)*	302	*(11⅞)*	
SQ-M/BSQ-M 100	473	*(18⅝)*	562	*(22⅛)*	527	*(20¾)*	352	*(13⅞)*	
SQ-M/BSQ-M 120	473	*(18⅝)*	610	*(24)*	578	*(22¾)*	406	*(16)*	
SQ-M/BSQ-M 130	473	*(18⅝)*	664	*(26⅛)*	629	*(24¾)*	454	*(17⅞)*	
SQ-M/BSQ-M 140	498	*(19⅝)*	714	*(28⅛)*	679	*(26¾)*	505	*(19⅞)*	
SQ-M/BSQ-M 160	597	*(23½)*	787	*(31)*	756	*(29¾)*	581	*(22⅞)*	Hanging rails not included. Supplied by others.
BSQ-M 180	648	*(25½)*	851	*(33½)*	751	*(29 9/16)*	578	*(22¾)*	
BSQ-M 200	740	*(29⅛)*	940	*(37)*	857	*(33¾)*	679	*(26¾)*	
BSQ-M 240	803	*(31⅝)*	1124	*(44¼)*	1035	*(40¾)*	860	*(33⅞)*	
BSQ-M 300	889	*(35)*	1295	*(51)*	1213	*(47¾)*	1038	*(40⅞)*	
BSQ-M 360	974	*(38¾)*	1454	*(57¼)*	1359	*(53½)*	1187	*(46¾)*	
BSQ-M 420	1197	*(47⅛)*	1600	*(63)*	1521	*(59⅞)*	1521	*(59⅞)*	

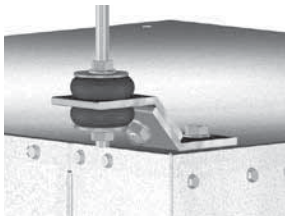
All dimensions in millimeters *(inches)*.

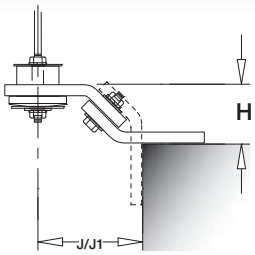
Isolator and Discharge Information

Neoprene Base Isolator

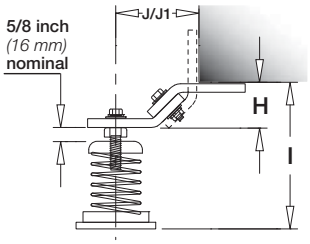


Neoprene Hanging Isolator

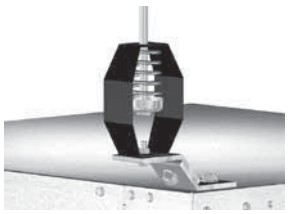


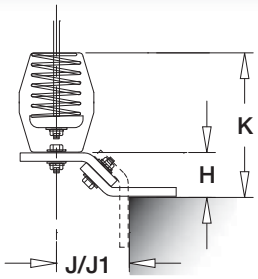


Spring Base Isolator



Spring Hanging Isolator





Neoprene Base Isolators						
Model	H	J	J1	L	I	K
SQ-M 70-90	38 *(1½)*	51 *(2)*	70 *(2¾)*	70 *(2¾)*	-	-
SQ-M 100-160	35 *(1⅜)*	51 *(2)*	-	67 *(2⅝)*		
BSQ-M 70-140	35 *(1⅜)*	35 *(1⅜)*	60 *(2⅜)*	67 *(2⅝)*		
BSQ-M 160-240	35 *(1⅜)*	35 *(1⅜)*	64 *(2½)*	67 *(2⅝)*		
BSQ-M 300	35 *(1⅜)*	35 *(1⅜)*	64 *(2½)*	80 *(3⅛)*		
BSQ-M 360	35 *(1⅜)*	35 *(1⅜)*	64 *(2½)*	105 *(4⅛)*		
BSQ-M 420						
Neoprene Hanging Isolators						
Model	H	J	J1	L	I	K
SQ-M 70-90	38 *(1½)*	51 *(2)*	70 *(2¾)*	-	-	-
SQ-M 100-160	35 *(1⅜)*	51 *(2)*	-			
BSQ-M 70-140	35 *(1⅜)*	35 *(1⅜)*	60 *(2⅜)*			
BSQ-M 160-420	35 *(1⅜)*	35 *(1⅜)*	64 *(2½)*			
Spring Base Isolators						
Model	H	J	J1	L	I	K
SQ-M 70-90	38 *(1½)*	51 *(2)*	70 *(2¾)*	-	152 *(6)*	-
SQ-M 100-160	35 *(1⅜)*	51 *(2)*	-		150 *(5¹⁵⁄₁₆)*	
BSQ-M 70-140	35 *(1⅜)*	35 *(1⅜)*	60 *(2⅜)*		150 *(5¹⁵⁄₁₆)*	
BSQ-M 160-420	35 *(1⅜)*	35 *(1⅜)*	64 *(2½)*		150 *(5¹⁵⁄₁₆)*	
Spring Hanging Isolators						
Model	H	J	J1	L	I	K
SQ-M 70-90	38 *(1½)*	51 *(2)*	70 *(2¾)*	-	-	140 *(5½)*
SQ-M 100-160	35 *(1⅜)*	51 *(2)*	-			135 *(5⁵⁄₁₆)*
BSQ-M 70-140	35 *(1⅜)*	35 *(1⅜)*	60 *(2⅜)*			135 *(5⁵⁄₁₆)*
BSQ-M 160-200	35 *(1⅜)*	35 *(1⅜)*	64 *(2½)*			135 *(5⁵⁄₁₆)*
BSQ-M 240-420	35 *(1⅜)*	35 *(1⅜)*	64 *(2½)*			160 *(6⁵⁄₁₆)*

All dimensions in millimeters *(inches)*.

Duct Length: The inlet and outlet duct length should be approximately two to three wheel diameters long before and after the fan to achieve cataloged performance.

Side Discharge: Make sure discharge is orientated in the same direction as originally ordered, performance will change with different discharge positions. Refer to Figure 6 for proper side discharge definition and the Side Discharge chart for dimensions. Refer to the CAPS program or consult factory for performance corrections.

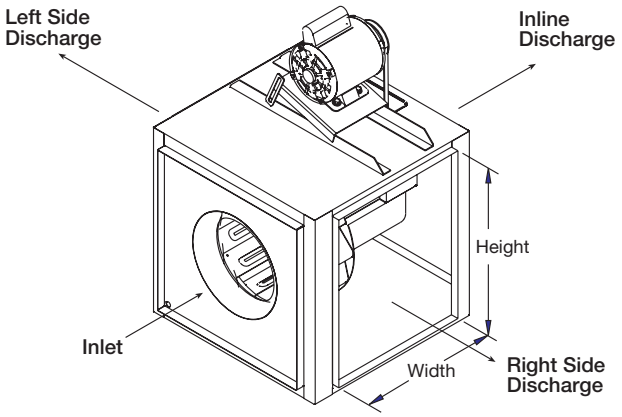


Figure 6

Side Discharge Duct Openings		
Unit Size	Width	Height
SQ-M 70	251 *(9⅞)*	225 *(8⅞)*
SQ-M 80-90	327 *(12⅞)*	302 *(11⅞)*
BSQ-M 70-80-90	302 *(11⅞)*	302 *(11⅞)*
SQ-M 100/BSQ-M 100	352 *(13⅞)*	352 *(13⅞)*
SQ-M 120/BSQ-M 120	403 *(15⅞)*	403 *(15⅞)*
SQ-M 130/BSQ-M 130 (HP)	454 *(17⅞)*	454 *(17⅞)*
SQ-M 140/BSQ-M 140 (HP)	505 *(19⅞)*	505 *(19⅞)*
SQ-M 160/BSQ-M 160 (HP)	581 *(22⅞)*	581 *(22⅞)*
BSQ-M 180 (HP)	606 *(23⅞)*	606 *(23⅞)*
BSQ-M 200 (HP)	708 *(27⅞)*	708 *(27⅞)*
BSQ-M 240 (HP)	733 *(28⅞)*	886 *(34⅞)*
BSQ-M 300 (HP)	810 *(31⅞)*	1064 *(41⅞)*
BSQ-M 360 (HP)	835 *(32⅞)*	962 *(37⅞)*
BSQ-M 420	886 *(34⅞)*	1114 *(43⅞)*

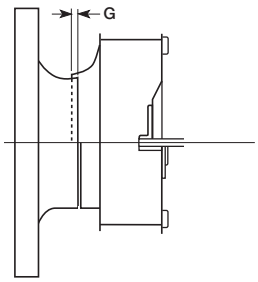
All dimensions in millimeters (*inches*).

Pre-Start-Up Checks, Operation & Inspection

Pre Start-Up Checks

1. **Check all fasteners for tightness.** The wheel should rotate freely and be aligned as shown in Figure 7. Wheel position is preset and the unit is tested at the factory. Movement may occur during shipment, and realignment may be necessary. Centering can be accomplished by loosening the bolts holding the inlet (venturi) panel and repositioning. Wheel and inlet cone overlap can be adjusted by loosening the setscrews in the wheel and moving the wheel to the desired position.

Wheel Overlap Dimensions



Model	G - Overlap mm (in.)
SQ-M 70-90	3 *(1/8)*
SQ-M 100-160	6 *(1/4)*
BSQ-M 70-160	6 *(1/4)*
BSQ-M 180-240	10 *(3/8)*
BSQ-M 300-420	13 *(1/2)*

Figure 7

2. **Wheel Rotation:** Direction of wheel rotation is critical. Reversed rotation will result in poor air performance, motor overloading and possible burnout. Check wheel rotation by momentarily energizing the unit (all SQ-M and BSQ-M fans have clockwise wheel rotation when viewed from top of fan). Rotation should be clockwise as shown in Figure 8 and correspond to the rotation decal on the unit.

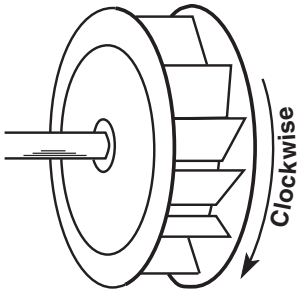


Figure 8

WARNING

Correct direction of wheel rotation is critical. Reversed rotation will result in poor air performance, motor overloading and possible burnout.

3. **Vibration Isolators:** After fan is moved to desired location, punch out the four knockout holes which are located on the unit top and bottom panels. Assemble the brackets to the unit according to the appropriate drawings on page 5. Make certain all connectors are tight and that all washers are in.
4. **For BSQ-M Fans:** If adjustments are made, it is very important to check the pulleys for proper alignment. Misaligned pulleys lead to excessive belt wear, vibration, noise, and power loss (see Figure 9).

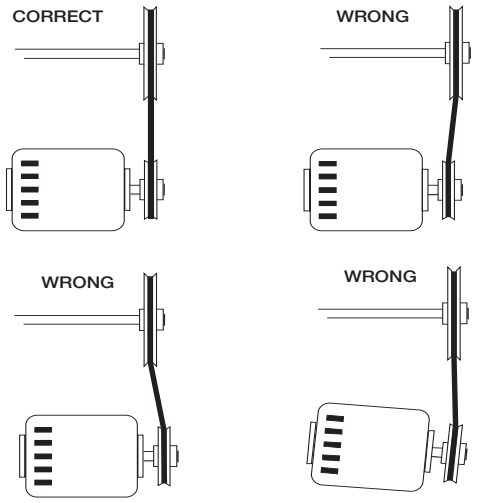
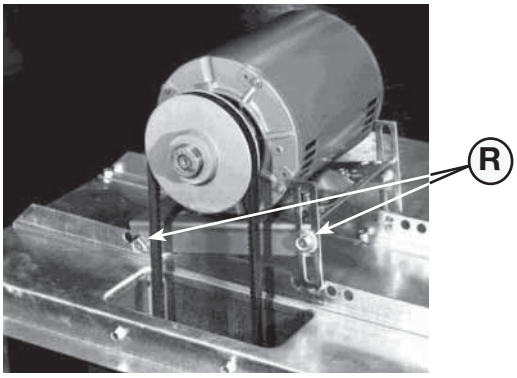


Figure 9

5. **For BSQ-M Fans:** Belt tension can be adjusted by loosening four fasteners marked “R” on the drive frame (see Figure 10). The motor plate slides on the slotted adjusting arms. Belt tension should be adjusted to allow 1/64 inch of deflection per inch of belt span. For example, a 15 inch belt span should have 15/64 inch (or about 1/4 inch) of deflection with moderate thumb pressure at mid-point between pulleys (see Figure 11). Over-tightening will cause excessive bearing wear and noise. Too little tension will cause slippage at start-up and uneven wear.



NOTE: Identical fasteners on opposing side must also be loosened.

Figure 10

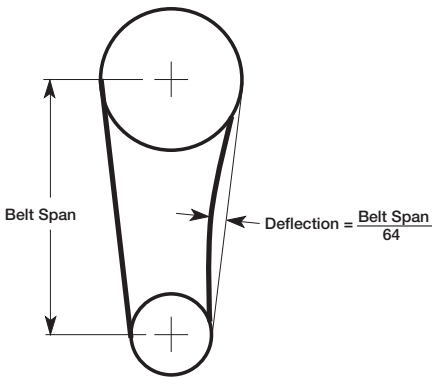


Figure 11

6. The adjustable motor pulley is factory set for the RPM specified. Speed can be increased by closing or decreased by opening the adjustable motor sheave. Two groove variable pitch pulleys must be adjusted an equal number of turns open or closed. Any increase in speed represents a substantial increase in the horsepower required by a unit. Motor amperage should always be checked to avoid serious damage to the motor when speed is varied.

IMPORTANT

The fan has been checked for mechanical noises at the factory prior to shipment. If mechanical noise should develop, suggested corrective actions are offered in the Troubleshooting section.

IMPORTANT

Over-tightening will cause excessive bearing wear and noise. Too little tension will cause slippage at start-up and uneven wear.

IMPORTANT

Adjust (tighten) belt tension after the first 24-48 hours of operation.

Operation: SQ-M / BSQ-M

1. Before starting up or operating fan, check all fasteners for tightness. In particular, check the setscrews in wheel hub (and pulleys, if applicable).
2. While in the OFF position or before connecting the fan to power, turn the fan wheel by hand to be sure it is not striking the venturi or any obstacle.
3. Start the fan and shut it off immediately to check rotation of the wheel with directional arrow in the motor compartment, see Figure 8.
4. When the fan is started, observe the operation and check for any unusual noises.
5. With the system in full operation and all ductwork attached, measure current input to the motor and compare with the nameplate rating to determine if the motor is operating under safe load conditions.
6. Keep inlets and approaches to fan clean and free from obstruction.

Inspection: SQ-M / BSQ-M

Inspection of the fan should be conducted at the first 30 minute and 24 hour intervals of satisfactory operation.

30 Minute Interval

Inspect bolts, setscrews and motor mounting bolts. Adjust and tighten as necessary.

24 Hour Interval

Check all internal components. On BSQ-M unit only, inspect belt alignment and tension. Adjust and tighten as necessary.

Maintenance: SQ-M / BSQ-M

Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations and who are experienced with this type of equipment.

Motor maintenance is generally limited to cleaning and lubrication for model BSQ-M. Motor cleaning should be limited to exterior surfaces only. Removing dust buildup on the motor housing ensures proper motor cooling.

Greasing of motors is only intended when fittings are provided. Many fractional horsepower motors are permanently lubricated and should not be lubricated after installation. Motors supplied with grease fittings should be greased in accordance with manufacturers' recommendations. Where motor temperatures do not exceed 104ºF *(40ºC)*, the grease should be replaced after 2,000 hours of running time as a general rule.

Wheels require very little attention when moving clean air. Occasionally, oil and dust may accumulate causing imbalance. When this occurs the wheel and housing should be cleaned to ensure smooth and safe operation.

All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.

A proper maintenance program will help these units deliver years of dependable service.

DANGER
Always disconnect, lock and tag power source before servicing. Failure to disconnect power source can result in fire, shock or serious injury.
IMPORTANT
Uneven cleaning of the wheel will produce an out of balance condition that will cause vibration in the fan.
WARNING
This unit should be made non-functional when cleaning the wheel or housing (fuses removed, disconnect locked off).

Torque Specifications for Bushings

Refer to the torque values imprinted on the hub as shown in Figure 12 for torque specifications. If there is no torque value on the hub, refer to the table below.

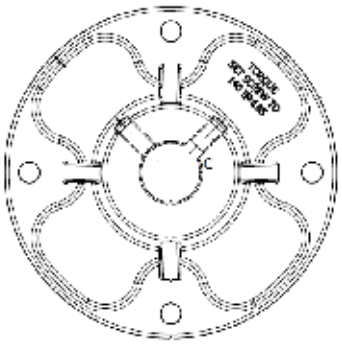


Figure 12

Torque Values For SQ-M & BSQ-M	
Set Screw	**Torque**
M8	11.3 Nm
M10	25.4 Nm

Belt/Bearing Maintenance BSQ-M Unit

1. Belts tend to stretch after a period of time. They should be checked periodically for wear and tightness. When replacing belts, use the same type as supplied with the unit.
2. Matched belts should always be used on units with multi-groove pulleys.
3. For belt replacement, loosen the tensioning device enough to allow removal of the belt by hand. Do not force belts on or off. This may cause cords to break, leading to premature belt failure.
4. Once installed, adjust belts as shown in "Pre-Start-Up Checks."
5. Shaft bearings can be classified in two groups: permanent lubricated and re-lubricating bearings. All bearings on standard model SQ-M fans are permanent lubricated bearings and require no further lubrication under normal temperature use.
6. Units installed in hot, humid or dirty locations should be equipped with special bearings. These bearings will require frequent lubrication. Caution should be employed to prevent overpacking or contamination.
7. Grease fittings should be wiped clean. The unit should be in operation while lubricating. Extreme care should be used around moving parts.
8. Grease should be pumped in very slowly until a slight bead forms around the seal. A high grade lithium base grease should be used.

Recommended Relubrication & Frequency Intervals in Months

NOTE: If unusual environment conditions exist (extreme temperature, moisture or contaminants) more frequent lubrication is required.

A good quality lithium base grease, conforming to NLGI Grade 2 consistency, such as those listed here may be used.

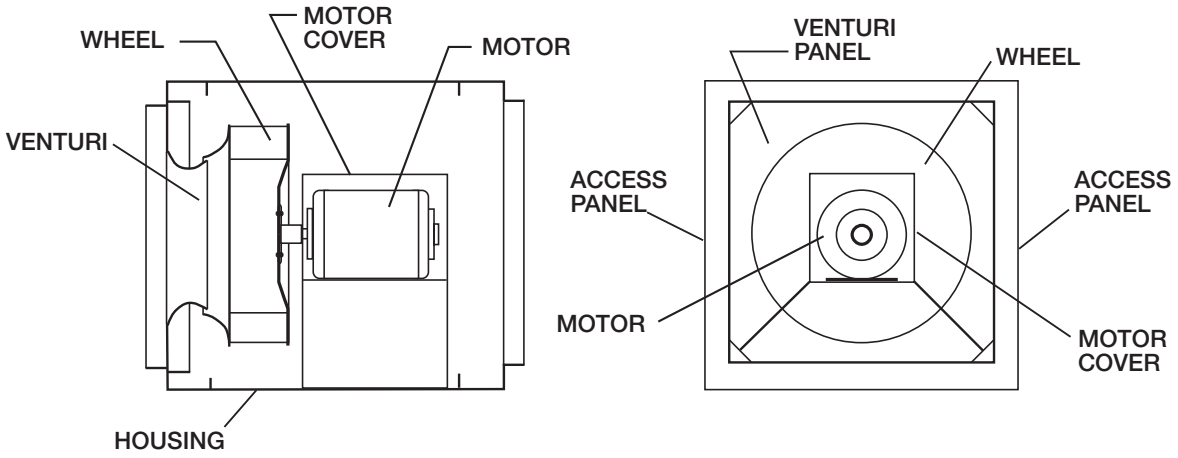
Grease Manufacturers	
Manufacturer	**Grease (NLGI #2)**
U.S. Electric Motors	Grease No. 83343
Chevron U.S.A. Inc	Chevron SRI Grease #2
Mobil Oil Corporation	Mobilith
	Mobil 532
Texaco, Inc.	Premium BRB #2
	Texaco Multifak #2
Amoco Oil Co.	Rykon Premium #2
Exxon	Unirex N2
Shell	B Shell Alvania #2

Suggested Fan Bearing Greasing Intervals	
Interval (months)	**Type of Service**
1 to 3	Heavy duty in dirty, dusty locations; high ambient temperatures; moisture laden atmosphere; vibration.
3 to 6	12 to 24 hours per day, heavy duty, or if moisture is present
6 to 12	8 to 16 hours per day in clean, relatively dry atmosphere
12 to 18	Infrequent operation or light duty in clean atmosphere

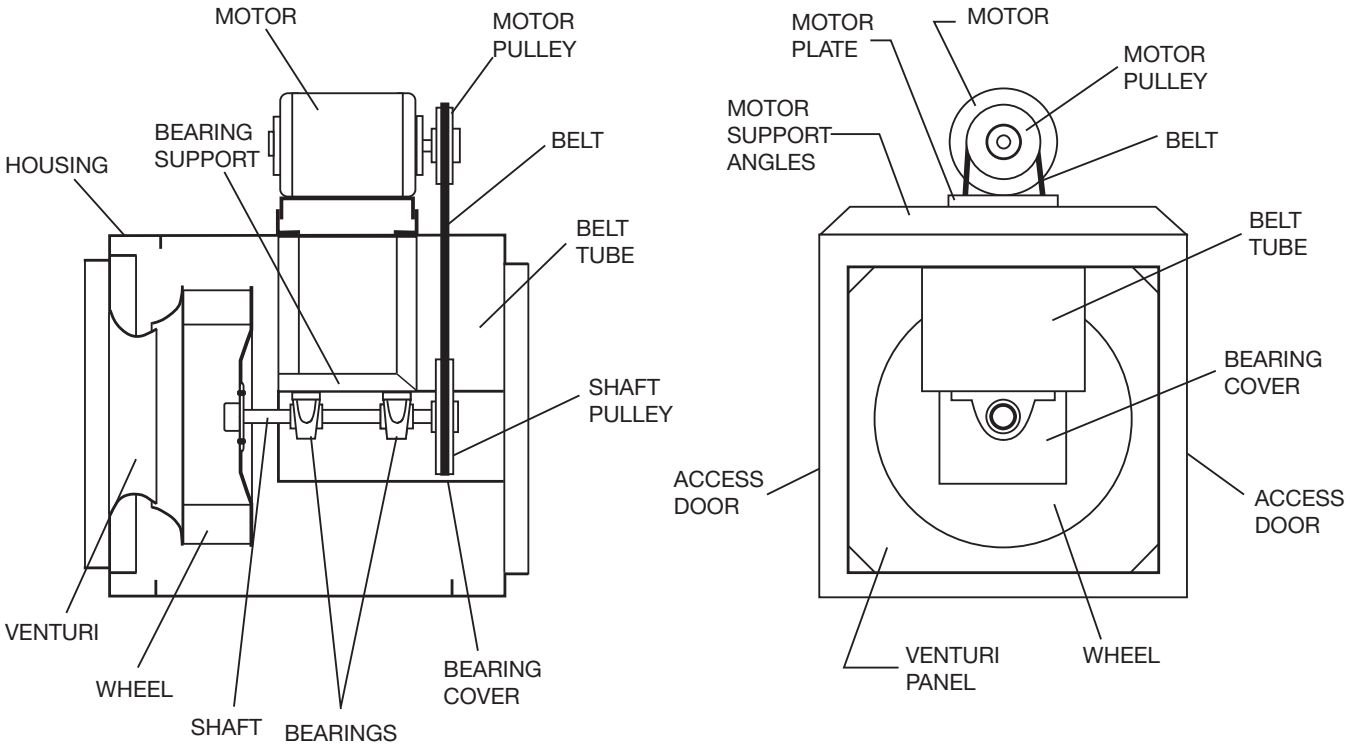
Parts List

Each fan bears a manufacturer's nameplate with model number and serial number embossed. This information will assist the local Greenheck representative and the factory in providing service and replacement parts. Before taking any corrective action, make certain the unit is not capable of operation during repairs.

SQ-M Direct Drive Centrifugal Inline Exhaust Fan



BSQ-M Belt Drive Centrifugal Inline Exhaust Fan



Troubleshooting

WARNING

Before taking any corrective action, make certain unit is not capable of operation during repairs.

PROBLEM	CAUSE	CORRECTIVE ACTION
Excessive noise or vibration	Wheel imbalance	Clean all dirt off wheel. Check wheel balance, rebalance in place if necessary.
	Bad bearings	Replace.
	Belts too tight or too loose	Adjust tension, see Figure 11.
	Wheel improperly aligned and rubbing	Center wheel on inlet, see Figure 7.
	Loose drive or motor pulleys	Align and tighten. See Pre Start-Up Checks, pages 6-7.
	Foreign objects in wheel or housing	Remove objects, check for damage or unbalance.
Reduced airflow	System resistance too high	Check system: Proper operation of backdraft or control dampers, obstruction in ductwork, clean dirty filters.
	Unit running backwards	Correct as shown in Figure 8.
	Excessive dirt buildup on wheels	Clean wheel.
	Improper wheel alignment	Center wheel on inlets, see Pre Start-Up Checks and Figure 7.

Our Commitment

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

Specific Greenheck product warranty is found in the Model Specification located on greenheck.co.in within the product area tab and in the Technical Data Library.

Greenheck's Centrifugal Inline Fans catalog, Models SQ-M and BSQ-M provides additional information describing the equipment, fan performance, available accessories, and specification data.

AMCA Publication 410-96, Safety Practices for Users and Installers of Industrial and Commercial Fans, provides additional safety information. This publication can be obtained from AMCA International, Inc. at www.amca.org.

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