MONOXIVENT®

Source Capture Systems

Operation and Maintenance Manual

Industrial Material Handling Fan
MHA

MONOXIVENT - SOURCE CAPTURE SYSTEMS

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MHA

Industrial Material Handling Fan

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL

This publication contains the installation, operation and maintenance instructions for standard units of the *MHA - Industrial Material Handler* Carefully read this publication prior to any installation or maintenance procedure.

Monoxivent catalog, *MHA*, provides additional information describing the equipment, fan performance, available accessories, and specification data.

For additional safety information, refer to AMCA publication 410-96, *Safety Practices for Users and Installers of Industrial and Commercial Fans*.

Receiving and Inspection

Carefully inspect the fan and accessories for any damage and shortage immediately upon receipt of the fan.

- Turn the wheel by hand to ensure it turns freely and does not bind.
- Inspect dampers (if supplied) for free operation of all moving parts.
- Record on the *Delivery Receipt* any visible sign of damage.

Handling

Lift the fan by the base or lifting eyes. Never lift by the shaft, motor, or housing.

Storage

If the fan is stored for any length of time prior to installation, completely fill the bearings with grease or moisture-inhibiting oil (refer to *Lubricants* on page 6). Also, store the fan in its original crate and protect it from dust, debris and the weather.

Outdoor Storage

To maintain good working condition of the fan when it is stored outdoors, follow the additional instructions below.

- Coat the shaft with grease or a rust preventative compound.
- Wrap bearings for weather protection
- Cover the inlet and outlet of the fan to prevent the accumulation of dirt and moisture in the housing.
- Periodically rotate the wheel and operate dampers (if supplied).
- Periodically inspect the unit to prevent damaging conditions.

WARNING
This unit has rotating parts. Safety precautions should be exercised at all times during installation, operation, and maintenance.
ALWAYS disconnect power prior to working on fan.

Installation

Most motors are shipped mounted on the fans with belts and drives installed. However, extremely heavy motors and drives are shipped separately. These motors and drives will require field installation. Please refer to pages 3-5.

Foundation

This fan requires a strong, level foundation of reinforced poured concrete. A correctly designed concrete foundation provides the best means for mounting floor units. The foundation's size is determined by fan size, motor size and position, and the specific location of the installation.

Use the following guidelines to calculate foundation size:

- The overall dimensions of the foundation should extend at least 6 inches beyond the outline of the fan and its motor.
- The weight of the foundation should be 2 to 3 times the weight of the unit and its motor.

Isolation

Isolation Base

To prevent vibration and noise from being transferred to the building isolators are recommended. Arrangement 1 fans require an isolation base to effectively isolate the fan system: fan, base, motor, drive, guards, etc. Bases must have sufficient rigidity to resist belt pull and prevent drive distortion which can lead to excessive belt and bearing

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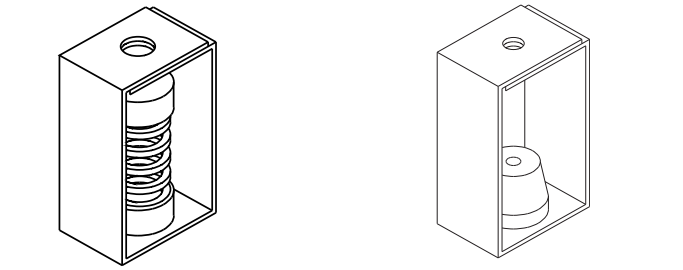
distortion which can lead to excessive belt and bearing wear; its perimeter should contain all base angles and rotating parts. Arrangement 10 fans above size 270 require isolation rails. Please consult factory for isolation of arrangement 9 fans due to the potential of uneven loading caused by the motor and drives. Isolators should be located between the fan system and the support structure.

Note
Although a certain amount of vibration is inherent in operating centrifugal fans, extreme vibration is a serious problem that may cause structural and mechanical failure.

Ceiling Mounted Isolators

Some applications require fan systems, designed for floor mounting, suspended from ceiling supports. In such cases, MHA fans of all arrangements should be installed on either rails or bases in the classical orientation. Typically, these systems are hung from the corners by rods, which include isolation hangers of either spring or rubber-in-shear design. ***Under no circumstances is the fan to be inverted and hung by its base angles.***



Ceiling Mounted Spring Isolator Rubber-in-Shear Ceiling Isolator

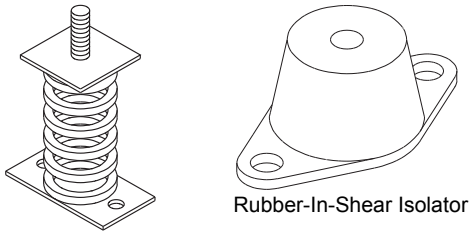
Figure 1- Ceiling Mount Isolators

Floor Mounted Spring Isolators

a. Mount fan and motor on isolation base (if supplied).
b. Elevate fan (or isolation base) to operating height and insert blocks to hold in position.
c. Position isolators under the fan (or isolation base) and vertically align by inserting leveling bolt through mounting holes in the fan or the base. The isolator must be installed on a level surface.
d. Adjust the isolators by turning the leveling nut counter clockwise several turns at a time alternately on each isolator until the fan weight is transferred onto the isolators and the fan raises uniformly off the blocks. Then remove the blocks.
e. Turn lock nut onto leveling bolt and secure firmly in place against the top of the mounting flange or frame.
f. Secure isolators to mounting surface.

Floor Mounted Rubber-In-Shear (RIS) Isolators

a. Mount fan and motor on an isolation base (if supplied).
b. Elevate fan to provide room to insert isolators between the fan and foundation and block in position.
c. Position isolators under fan and secure bolts.
d. Remove blocks and allow fan to rest on floor. Isolators must be installed on a level surface (leveling should not be required).
e. Secure isolators to mounting surface.



Spring Isolator Rubber-In-Shear Isolator

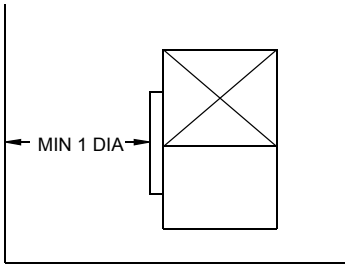
Figure 2 -Floor Mount Isolators

Duct Installation

Efficient fan performance relies on the proper installation of inlet and discharge ducts. Be sure your fan conforms to the guidelines below.

Non-Ducted Inlet Clearance

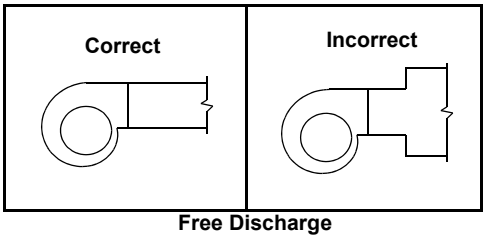
If your fan has an open inlet (no duct work), the fan must be placed 1 fan wheel diameter away from walls and bulkheads. An inlet bell should be used in this case.



Non-ducted Inlet Clearance

Free Discharge

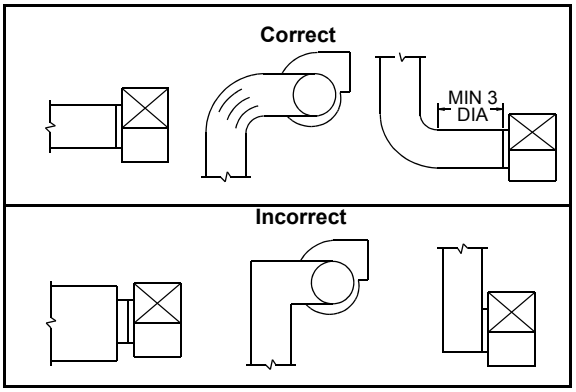
Avoid a free discharge into the plenum. This will result in lost efficiency because it doesn't allow for a static regain.



Free Discharge

Inlet Duct Turns

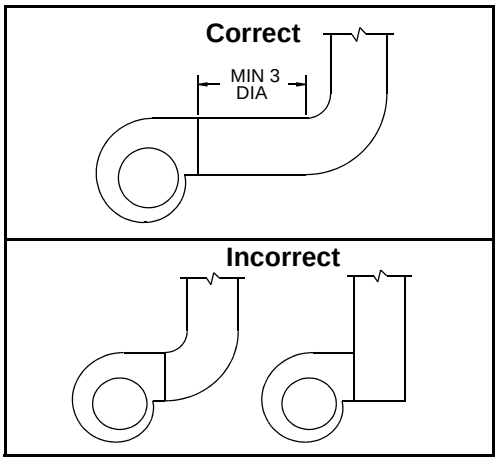
For ducted inlets, allow at least 3 fan wheel diameters between duct turns or elbows and the fan inlet.



Inlet Duct Turns

Discharge Duct Turns

Make sure that duct turns located near the fan discharge curve in the direction of the fan's rotation. Refer to the Discharge Duct Turns illustration on page 3.

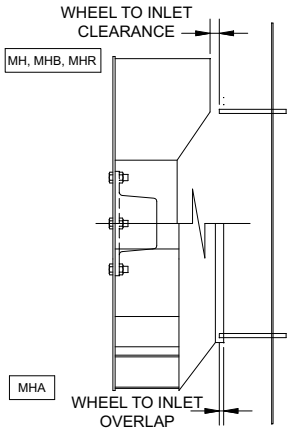


Discharge Duct Turns

Wheel-to-Inlet Clearance

The correct wheel-to-inlet clearance is critical to proper fan performance. This clearance should be verified before initial start-up since rough handling during shipment could cause a shift in fan components. Refer to wheel/inlet drawing below for correct clearance.

Adjust the overlap by loosening the wheel hub and moving the wheel along the shaft to obtain the correct value.



Wheel-to-Inlet Clearance and Overlap

Size	MH, MHBM MHR		MHA	
	Wheel to Inlet Ring Clearance		Wheel to Inlet Ring Overlap	
	Min.	Max.	Min.	Max.
70	3/16	5/16	1/8	1/4
90	3/16	5/16	1/8	1/4
110	3/16	5/16	3/16	5/16
130	3/16	5/16	1/4	3/8
150	3/16	5/16	1/4	3/8
170	3/16	5/16	5/16	7/16
190	3/16	5/16	3/8	1/2
210	5/16	7/16	7/16	9/16
230	5/16	7/16	7/16	9/16
260	5/16	7/16	1/2	5/8
290	5/16	7/16	5/8	3/4

Wiring Installation

All wiring should be in accordance with local ordinances and the National Electrical Code, NFPA 70. Ensure the power supply (voltage, frequency, and current carrying capacity of wires) is in accordance with the motor nameplate.

Lock off all power sources before unit is wired to power source.

Leave enough slack in the wiring to allow for motor movement when adjusting belt tension. Some fractional motors have to be removed in order to make the connection with the terminal box at the end of the motor. To remove motor, remove bolts securing motor base to power assembly. Do not remove motor mounting bolts.

Follow the wiring diagram in the disconnect switch and the wiring diagram provided with the motor. Correctly label the circuit on the main power box and always identify a closed switch to promote safety (i.e., red tape over a closed switch).

Personal Safety

Disconnect switches are recommended. Place the disconnect switch near the fan in order that the power can be swiftly cut off in case of an emergency, and in order that maintenance personnel are provided complete control of the power source.

Wheel Rotation

Test the fan to ensure the rotation of the wheel is the same as indicated by the arrow marked Rotation.

115 and 230 Single Phase Motors

Fan wheel rotation is set correctly at the factory. Changing the rotation of this type of motor should only be attempted by a qualified electrician.

208, 230, and 460, 3 Phase Motors

These motors are electrically reversible by switching two of the supply leads. For this reason, the rotation of the fan cannot be restricted to one direction at the factory. *See Wiring Diagrams on page 4 for specific information on reversing wheel direction.*

Do not allow the fan to run in the wrong direction. This will overheat the motor and cause serious damage. For 3-phase motors, if the fan is running in the wrong direction, check the control switch. It is possible to interchange two leads at this location so that the fan is operating in the correct direction.

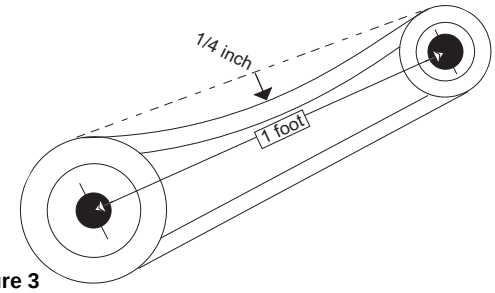


Figure 3

Belt and Pulley Installation

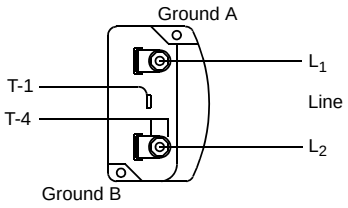
Belt tension is determined by the sound the belts make when the fan is first started. Belts will produce a loud squeal which dissipates after the fan is operating at full capacity. If the belt tension is too tight or too loose, lost efficiency and possible damage can occur.

Do not change the pulley pitch diameter to change tension. This will result in a different fan speed than desired.

a. Loosen motor plate adjustment nuts and move motor plate in order that the belts can easily slip into the grooves on the pulleys. Never pry, roll, or force the belts over the rim of the pulley.
b. Adjust the motor plate until proper tension is reached. For proper tension, a deflection of approximately 1/4" per foot of center distance should be obtained by firmly pressing the belt. Refer to figure 3.
c. Lock the motor plate adjustment nuts in place.
d. Ensure pulleys are properly aligned. Refer to Figure 4.

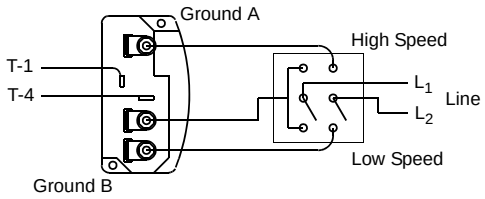
Wiring Diagrams

Single Speed, Single Phase Motor



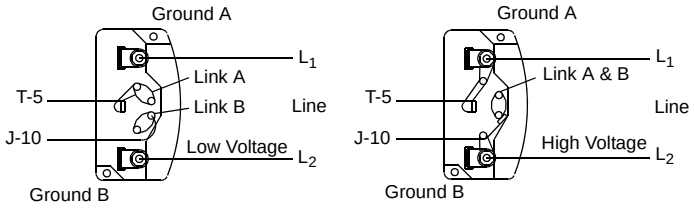
When ground is required, attach to ground A or B with no. 6 thread forming screw. To reverse, interchange T-1 and T-4.

2 Speed, 2 Winding, Single Phase Motor



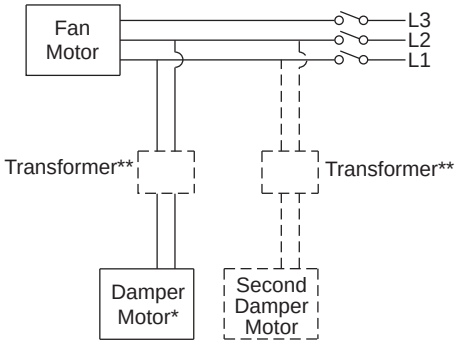
When ground required, attach to ground A or B with No. 6 thread forming screw. To reverse, interchange T-1 and T-4 leads.

Single Speed, Single Phase, Dual Voltage



When ground required, attach to ground A or B with No. 6 thread forming screw. To reverse, interchange T-5 and J-10 leads.

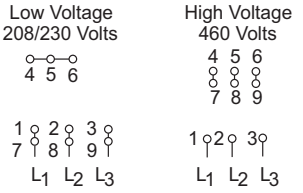
Typical Damper Motor Schematic



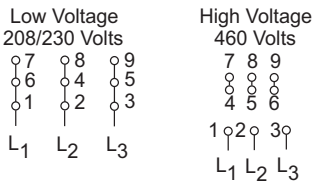
For 3 phase, damper motor voltage should be the same between L_1 and L_2. For single phase application, disregard L_3. *Damper motors may be available in 115, 230 and 460 volt models. The damper motor nameplate voltage should be verified prior to connection. **A transformer may be provided in some installations to correct the damper motor voltage to the specified voltage.

Wiring Diagrams

3 Phase, 9 Lead Motor Y-Connection

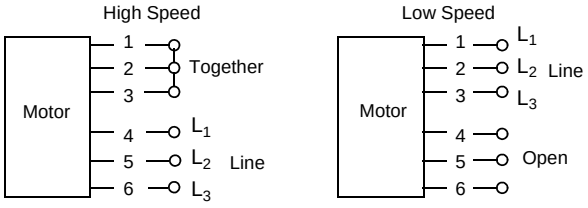


3 Phase, 9 Lead Motor Delta-Connection



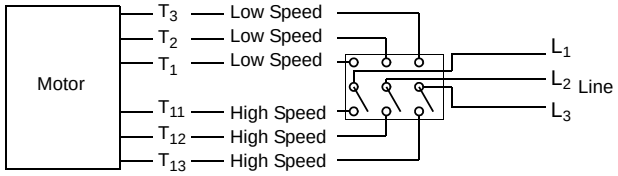
To reverse, interchange any 2 line leads.

2 Speed, 1 Winding, 3 Phase Motor



To reverse, interchange any 2 line leads. Motors require magnetic control.

2 Speed, 2 Winding, 3 Phase



To reverse: High Speed-interchange leads T_{11} and T_{12}.
Low Speed-interchange leads T_1 and T_2. Both Speeds-interchange any 2 line leads.

Pulley Alignment

Pulley alignment is adjusted by loosening the motor pulley setscrew and by moving the motor pulley on the motor shaft.

Figure 4 indicates where to measure the allowable gap for the drive alignment tolerance. All contact points (indicated by WXYZ) are to have a gap less than the tolerance shown in the table.

When the pulleys are not the same width, the allowable gap must be adjusted by half of the difference in width. *Figure 5* illustrates using a carpenter's square to adjust the position of the motor pulley until the belt is parallel to the longer leg of the square.

Tolerance

Center Distance	Maximum Gap
Up thru 12"	1/16"
12" up through 48	1/8"
Over 48"	1/4"

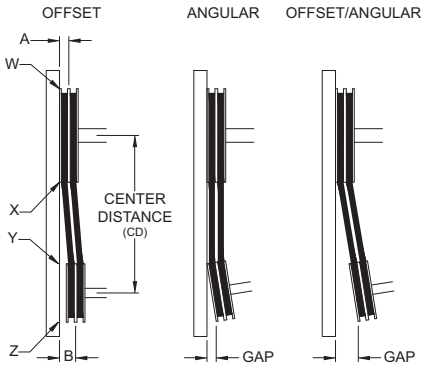


Figure 4

Final Installation Steps

a. Inspect fasteners and setscrews, particularly fan mounting and bearing fasteners, and tighten according to the recommended torque shown in the table *Recommended Torque for Setscrews/Bolts*.
b. Inspect for correct voltage with voltmeter.
c. Ensure all accessories are installed.

Operation

Pre-Start Checks

a. Lock out all the primary and secondary power sources.
b. Ensure fasteners and setscrews, particularly those used for mounting the fan, are tightened.
c. Inspect belt tension and pulley alignment.
d. Inspect motor wiring.
e. Ensure belt touches only the pulley.
f. Ensure fan and ductwork are clean and free of debris.
g. Inspect wheel-to-inlet clearance.
The correct wheel-to-inlet clearance is critical to proper fan performance.
h. Close and secure all access doors.
g. Restore power to the fan.

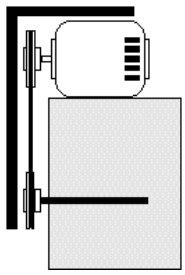


Figure 5

Start Up

Turn the fan on. In variable speed units, set the fan to its lowest speed and inspect for the following:

- Direction of rotation.
- Excessive vibration.
- Unusual noise.
- Bearing noise.
- Improper belt alignment or tension (listen for squealing).
- Improper motor amperage or voltage.

If a problem is discovered, immediately shut the fan off. Lock out all electrical power and check for the-cause of the trouble. See **Troubleshooting.**

Recommended Torque for Setscrews/Bolts (IN/LB.)

Setscrews				Hold Down Bolts	
Size	Key Hex Across Flats	Recommended Torque			
		Min.	Max.	Size	Wrench Torque
No.10	3/32”	28	33	3/8”-16	240
1/4”	1/8”	66	80	1/2”-13	600
5/16”	5/32”	126	156	5/8”-11	1200
3/8”	3/16”	228	275	3/4”-10	2100
7/16”	7/32”	348	384	7/8”- 9	2040
1/2”	1/4”	504	600	1”- 8	3000
5/8”	5/16”	1104	1200	1-1/8” - 7	4200
3/4”	3/8”	1440	1800	1-1/4” - 7	6000

Inspection

Inspection of the fan should be conducted at the first **30 minute, 8 hour** and **24 hour** intervals of satisfactory operation. During the inspections, stop the fan and inspect as per the *Conditions Chart*.

30 Minute Interval

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

8 Hour Interval

Inspect belt alignment and tension. Adjust and tighten as necessary.

24 Hour Interval

Inspect belt tension, bolts, setscrews, and motor adjusting bolts. Adjust and tighten as necessary.

Maintenance

Establish a schedule for inspecting all parts of the fan. The frequency of inspection depends on the operating conditions and location of the fan.

Inspect fans exhausting corrosive or contaminated air within the first month of operation. Fans exhausting contaminated air (airborne abrasives) should be inspected every three months.

Regular inspections are recommended for fans exhausting non-contaminated air.

It is recommended the following inspection be conducted twice per year.

- Inspect bolts and setscrews for tightness. Tighten as necessary. Worn setscrews should be replaced immediately.
- Inspect belt wear and alignment. Replace worn belts with new belts and adjust alignment as needed. See *Belt and Pulley Installation*, page 3.
- Bearings should be inspected as recommended in the *Conditions Chart*.
- Inspect variable inlet vanes for freedom of operation and excessive wear. The vane position should agree with the position of the control arm. As the variable inlet vanes close, the entering air should spin in the same direction as the wheel.
- Inspect springs and rubber isolators for deterioration and replace as needed.
- Inspect for cleanliness. Clean exterior surfaces only. Removing dust and grease on motor housing assures proper motor cooling. Removing dirt from the wheel and housing prevent imbalance and damage.

Lubrication Conditions Chart			
Fan Class	Fan Status	Shaft Size	Maximum Interval (operational hrs)
Standard Duty	Normal Conditions (Clean, Dry & Smooth)	> 2”	7,500
		< 2”	1,000
	Extreme Conditions (Dirty/Wet/Rough)	> 2”	1,500
		< 2”	200
Heavy Duty	Normal Conditions (Clean, Dry & Smooth)	> 2”	3,000
		< 2”	500
	Extreme Conditions (Dirty/Wet/Rough)	> 2”	500
		< 2”	100

Lubrication

Before lubricating, the grease nipple and immediate vicinity should be thoroughly cleaned without the use of high pressure equipment. The grease should be supplied slowly as the bearing rotates until fresh grease slips past the seal. Excessive pressure should be avoided to prevent seal damage.

Exceptions to the greasing interval chart:

• ***Periodic Applications (any break of one week or more):*** it is recommended that full lubrication be performed prior to each break in operation.

• ***Higher Temperature:*** it is recommended to halve the intervals for every 30°F increase in operating temperature above 120°F not to exceed 230°F for standard bearings; High Temperature bearings (optional) can operate up to 400°F.

• ***Vertical Shaft:*** it is recommended that the intervals should be halved.

Lubricants

Monoxivent uses petroleum lubricant in a lithium base. Other types of grease should not be used unless the bearings and lines have been flushed clean. If another type of grease is used, it should be a lithium-based grease conforming to NLGI grade 2 consistency.

A NLGI grade 2 grease is a light viscosity, low-torque, rust-inhibiting lubricant that is water resistant. Its temperature range is from -30°F to +200°F and capable of intermittent highs of +250°F.

Motor Bearings

Motors are provided with prelubricated bearings. Any lubrication instructions shown on the motor nameplate supersede instructions below.

Direct Drive 1050/1075,1200,1300 &1500 rpm units use a prelubricated sleeve bearing that has a oil saturated wicking material surrounding it. The initial factory lubrication is adequate for up to 10 years of operation under normal conditions. However, it is advisable to add lubricant after 3 years. Use only LIGHT grade mineral oil or SAE 10W oil up to 30 drops. If the unit has been stored for a year or more it is advisable to lubricate as directed above. For direct drive units and other units in severe conditions, lubrication intervals should be reduced to half.

Motors without sleeve bearings (as described above) will have grease lubricated ball or roller bearings. Motor bearings without provisions for relubrication will operate up to 10 years under normal conditions with no maintenance. In severe applications, high temperatures or excessive contaminates, it is advisable to have the maintenance department disassemble and lubricate the bearings after 3 years of operation to prevent interruption of service.

For motors with provisions for relubrication, follow intervals of the table below.

Relubrication Intervals

Service Conditions	NEMA Frame Size					
	Up to and including 184T		213T-365T		404T and larger	
	1800 RPM and less	Over 1800 RPM	1800 RPM and less	Over 1800 RPM	1800 RPM and less	Over 1800 RPM
Standard	3 yrs.	6 months	2 yrs.	6 months	1 yr.	3 months
Severe	1 yr.	3 months	1 yr.	3 months	6 months	1 months

Motors are provided with a polyurea mineral oil NGLI #2 grease. All additions to the motor bearings are to be with a compatable grease such as Exxon Mobil Polyrex EM and Chevron SRI.

The above intervals should be reduced to half for vertical shaft installations.

Fan Bearings

Greasable fan bearings are lubricated through a grease fitting on the bearing and should be lubricated by the schedule, *Conditions Chart*.

For best results, lubricate the bearing while the fan is in operation. Pump grease in slowly until a slight bead forms around the bearing seals. Excessive grease can burst seals thus reducing bearing life.

In the event the bearing cannot be seen, use no more than three injections with a hand-operated grease gun.

Motor Services

Should the motor prove defective within a one-year period, contact your local Monoxivent representative or your nearest authorized electric motor service representative.

Changing Shaft Speed

All belt driven fans with motors up to and including 5 HP (184T max.) are equipped with variable pitch pulleys. To change the fan speed, perform the following:

a. Loosen setscrew on driver (motor) pulley and remove key, if equipped.
b. Turn the pulley rim to open or close the groove facing. If the pulley has multiple grooves, all must be adjusted to the same width.
c. After adjustment, inspect for proper belt tension.

Speed Reduction

Open the pulley in order that the belt rides deeper in the groove (smaller pitch diameter).

Speed Increase

Close the pulley in order that the belt rides higher in the groove (larger pitch diameter). Ensure that the RPM limits of the fan and the horsepower limits of the motor are maintained.

Replacing Pulleys and Belts

a. Remove pulleys from their respective shafts.
b. Clean the motor and fan shafts.
c. Clean bores of pulleys and coat the bores with heavy oil.
d. Remove grease, rust, or burrs from the pulleys and shafts.
e. Remove burrs from shaft by sanding.
f. Place fan pulley on fan shaft and motor pulley on its shaft. Damage to the pulleys can occur when excessive force is used in placing the pulleys on their respective shafts.
g. Tighten in place.
h. Install belts on pulleys and align as described in the *Belt and Pulley Installation* section.

Maximum RPM

Unit Size	Maximum RPM	
	SD*	HD**
70	3742	6236
90	2934	4889
110	2397	3994
130	2026	3377
150	1755	2924
170	1547	2579

Unit Size	Maximum RPM	
	SD*	HD**
190	1389	2315
210	1256	2093
230	1146	1910
260	1016	1693
290	908	1513

Unless otherwise noted wheel construction for standard duty and heavy duty is the same. *Standard duty, **Heavy duty

RPM Derating Factor

Steel	
Temp. °F	RPM
70	1.00
200	.98
300	.96
400	.94
500	.91
600	.87
700	.81
800	.75

Aluminum	
Temp. °F	RPM
70	1.00
200	0.93
300	0.79

For elevated airstream temperatures, the maximum RPM limits must be derated by the factors found in the RPM Derating Factor table above.

Speed Reduction

Open the pulley in order that the belt rides deeper in the groove (smaller pitch diameter).

Speed Increase

Close the pulley in order that the belt rides higher in the groove (larger pitch diameter). Ensure that the RPM limits of the fan and the horsepower limits of the motor are maintained.

Replacing Pulleys and Belts

a. Remove pulleys from their respective shafts.
b. Clean the motor and fan shafts.
c. Clean bores of pulleys and coat the bores with heavy oil.
d. Remove grease, rust, or burrs from the pulleys and shafts.
e. Remove burrs from shaft by sanding.
f. Place fan pulley on fan shaft and motor pulley on its shaft. Damage to the pulleys can occur when excessive force is used in placing the pulleys on their respective shafts.
g. Tighten in place.
h. Install belts on pulleys and align as described in the *Belt and Pulley Installation* section.

Bearing Replacement

The fan bearings are pillow block ball bearings.

An emery cloth or file may be needed to remove imperfections in the shaft left by the setscrews.

a. Mark the position on the shaft of both bearing races, setscrews, and the wheel and pulley. Note the clearance between the wheel and inlet.
b. Remove the fan pulley and belts.
c. Remove the inlet side panel by removing the bolts around the perimeter of panel.
d. Remove inlet cone by removing attaching bolts/nuts around perimeter of the inlet plate.
e. Remove wheel from the shaft. A 2-jaw puller may be needed.
f. Remove bearing hold-down bolts. Remove shaft and bearings as one unit.g. Remove the anti-corrosion coating from the shaft with a suitable degreaser.
h. Remove the bearing from the shaft using a bearing puller. If a bearing puller is not available, tap on the bearing with a wood block and hammer to remove it.
i. Smooth and clean the shaft and bearing bore thoroughly.
j. Place the bearings into position making sure they are not on a worn section of the shaft. Tapping the inner ring face with a soft driver may be required.

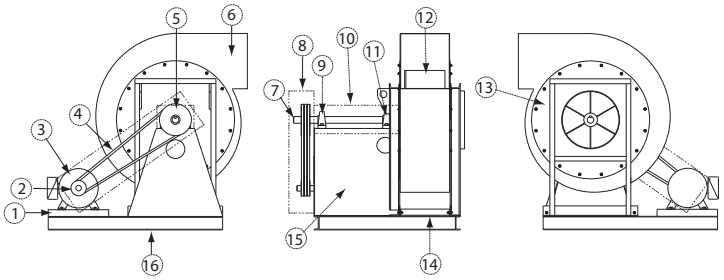
Do not hammer on the housing.

k. The outer ring of the bearing is spherical and swivels in the housing to compensate for misalignment. Secure hold-down bolts, but **do not fully tighten**.
l. Align the setscrews on the bearings and tighten one setscrew on each bearing.
m. Rotate the shaft to allow the bearing outer rings to find their center of free movement.
n. Install the wheel on the shaft and install the inlet side panel in its original location. Adjust bearing position and inlet side panel to center the wheel in the inlet.
o. Tighten bearing hold-down bolts to proper torque. Refer to *Torque Chart*.
p. Turn the shaft by hand. Resistance should be the same as it was before hold-down bolts were fully tightened.
q. Tighten bearing setscrews to specified torque as noted in the Torque Chart.
r. Reinstall the pulley and adjust the belt tension. Refer to Belt and Pulley Installation.
s. Test run the fan and trim balance as necessary (.0785 in/sec max.).
t. Re-tighten setscrews on bearings, sheave, and wheel. Recheck belt tension and adjust as needed.

Troubleshooting

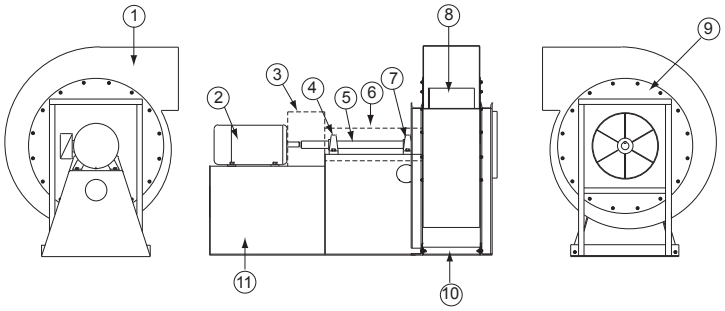
Problem and Potential Cause
Low Capacity or Pressure •Incorrect direction of rotation. Make sure the fan rotates in same direction as the arrows on the motor or belt drive assembly. •Poor fan inlet conditions. There should be a straight clear duct at the inlet. •Improper wheel alignment.
Excessive Vibration and Noise •Damaged or unbalanced wheel. •Belts too loose; worn or oily belts. •Speed too high. •Incorrect direction of rotation. Make sure the fan rotates in same direction as the arrows on the motor or belt drive assembly. •Bearings need lubrication or replacement. •Fan surge or inlet or outlet conditions.
Overheated Motor •Motor improperly wired. •Incorrect direction of rotation. Make sure the fan rotates in same direction as the arrows on the motor or belt drive assembly. •Cooling air diverted or blocked. •Improper inlet clearance. •Incorrect fan RPMs. •Incorrect voltage.
Overheated Bearings •Improper bearing lubrication •Excessive belt tension.

MHA Parts List - Arrangement 1



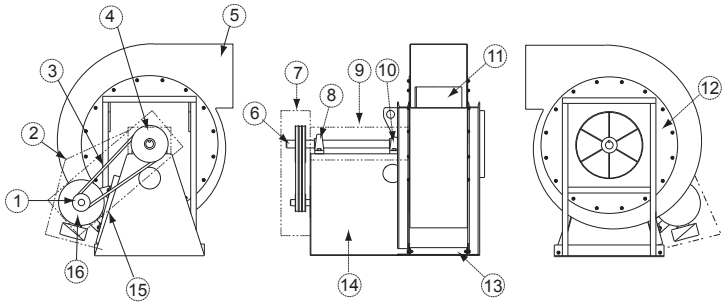
Part No.	Arrangement 1 Sizes 70-290	Part No.	Arrangement 1 Sizes 70-290
1	Motor Slide Base (Optional)	9	Drive Side Bearing
2	Motor Sheave	10	Shaft Guard (Optional)
3	Motor	11	Opposite Drive Side Bearing
4	Belt Set	12	Wheel
5	Fan Sheave	13	Inlet Side Panel
6	Housing	14	Spreader Bar (2)
7	Shaft	15	Bearing Pedestal
8	Belt Guard (Optional)	16	Isolation Base (Optional)

MHA Parts List - Arrangement 8



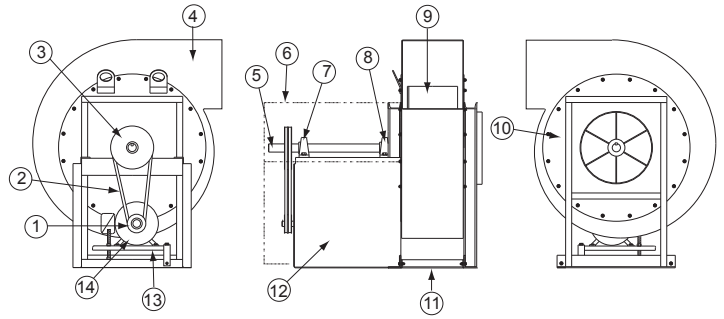
Part No.	Arrangement 8 Sizes 70-920	Part No.	Arrangement 8 Sizes 70-920
1	Housing	7	Opposite Drive Side Bearing
2	Motor	8	Wheel
3	Optional Coupling Guard	9	Inlet Side Panel
4	Drive Side Bearing	10	Spreader Bar (2)
5	Shaft	11	Motor/Bearing Pedestal
6	Shaft Guard (Optional)		

MHA Parts List - Arrangement 9



Part No.	Arrangement 9 Sizes 70-290	Part No.	Arrangement 9 Sizes 70-290
1	Motor Sheave	9	Shaft Guard (Optional)
2	Motor Cover (optional)	10	Opposite Drive Side Bearing
3	Belt Set	11	Wheel
4	Fan Sheave	12	Inlet Side Panel
5	Housing	13	Spreader Bar (2)
6	Shaft	14	Bearing Pedestal
7	Belt Guard (Optional)	15	Motor Slide Base
8	Drive Side Bearing	16	Motor

MHA Parts List - Arrangement 10 (Available in SD only)



Part No.	Arrangement 10 Sizes 70 - 290	Part No.	Arrangement 10 Sizes 70 - 290
1	Motor Sheave	8	Opposite Drive Side Bearing
2	Belt Set	9	Wheel
3	Fan Sheave	10	Inlet Side Panel
4	Housing	11	Spreader Bar (2)
5	Shaft	12	Bearing Pedestal
6	Weather Cover/Belt Guard	13	Motor Mount Assembly
7	Drive Side Bearing	14	Motor