



REVERSOMATIC
MANUFACTURING LIMITED

INSTALLATION & MAINTENANCE GUIDE

A, AF, BEA, BES, FA, H, RBD, RDD, RE, RHE, RHS, UBA, UBD, UBS, UDD General Instructions

REGULAR MAINTENANCE / LUBRICATION OF THIS UNIT IS REQUIRED TO MAINTAIN THE MANUFACTURER'S WARRANTY.

FOR MOTORS LARGER THAN 7 ½ HP, AN ELECTRONIC "SOFT START" CONTROL IS RECOMMENDED FOR LONGER BELT LIFE.

C A U T I O N

IT IS STRONGLY RECOMMENDED THAT BEFORE STARTING UP THE FAN THE FOLLOWING INSPECTIONS ARE PERFORMED.

- 1. FAN BELT (IF USED) TIGHTNESS AND ALIGNMENT.**
- 2. FAN BLADE CENTERING AND ROTATION.**
- 3. FAN BLADE MOUNTING BOLT TIGHTNESS.**
- 4. MOTOR MOUNTING PLATE BOLT TIGHTNESS.**
- 5. BEARING LUBRICATION.**

WARNINGS AND SAFETY INSTRUCTIONS

1. Do not operate the fan excess of maximum limit.
2. Do not permit any object to enter the fan inlets or outlets; provide a screen covering.
3. Do not operate the fan without adequate guards over rotating parts; provide drive belt, coupling and shaft guards.
4. Provide a disconnect switch with a padlock to prevent fan switch use during maintenance.
5. Locate a disconnect switch at the fan for use of personnel working on the fan.
6. Provide vibration limiting switches to detect sudden changes in the operation of the fan, especially when operating a fan under high temperatures or in an extremely corrosive atmosphere such as fly ash.
7. Lubricate and service bearings regularly. see lubrication schedule.

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Performance Problems:

CFM too low - These are some common sources of this problem:

Fan - forward curved impeller installed backwards, fan running backwards, cutoff missing or improperly installed, impeller not centered with inlet collars, fan speed too slow.

System - more resistant to flow than expected, dampers or registers closed, leaks in supply ducts, insulating duct liner loose, clogged filters or coils.

Fan Inlets - leaks around fan inlets, elbows near the inlet, cabinet walls too close. Inlet obstructions cause more restrictive systems but do not cause increased negative pressure readings near the fan inlets. Fan speed may be increased to counteract the effect of restricted fan inlet, but check the maximum RPM for the wheel construction before increasing the speed.

Fan Outlet - most centrifugal fans are used in ducted systems and have been tested with a length of straight duct at the fan outlet, If there is no straight duct at the fan outlet, decreased fan performance will result. If it is not practical to install a straight section of duct at the fan outlet, the fan speed may be increased to overcome this pressure loss. Other sources affecting fan outlet may be sharp elbow nearby, improperly designed turning vanes or other obstructions near the outlet.

Noise - may be caused by:

- Impeller hitting the inlet of the fan or cutoff plate, loose impeller.
- Drives can cause noise if sheaves are not tight on the shaft, belts are too loose or too tight, wrong belt cross section, or mis-matched belts, also worn belts, oily belts or mis-aligned sheaves.
- If couplings are used they may be source of noise by being unbalanced, misaligned, loose or dry of lubricant.
- Bad bearings are a common source of noise when defective, dry of lubricant, loose on the bearing support, loose on the shaft, seals mis-aligned, dirty lubricant, fretting corrosion between inner race and shaft, etc. See separate section on bearing care.
- There can be an electrical source of noise such as AC hum in motor or relay, starting relay chatter, noisy motor bearings, single phasing a 3 phase motor, etc.
- A bent or undersized shaft may be a noise source. **IF MORE THAN TWO BEARINGS ARE ON THE SAME SHAFT, THEY MUST BE CAREFULLY ALIGNED.**
- There may be other noise sources such as obstruction in high velocity air stream causing rattle or pure tone whistle, fan operating at undesirable design point, causing pulsation, cracks or holes in duct work, or whistles in fan housing.

LUBRICATION

RELUBRICATION SCHEDULE (MONTHS)* Ball Bearing Pillow Blocks

SHAFT DIAMETER	Operating Speed (RPM)									
	500	1000	1500	2000	2500	3000	3500	4000	4500	5000
5/8" thru 1"	6	6	6	6	4	4	4	4	2	2
1 1/8" thru 1 1/2"	6	6	6	4	4	4	2	2	2	1
1 5/8" thru 1 15/16"	6	6	6	4	4	2	2	1	1	-
2" thru 2 1/2"	6	6	4	4	2	1	1	-	-	-
2 11/16" thru 3 3/16"	6	4	2	2	1	1	1/2	-	-	-

*Suggested initial greasing interval - relubricate while running, if safety permits, until some purging occurs at seals. Adjust lubrication frequency depending on condition of purged grease. Hours of operation, temperature, and surrounding conditions will affect the relubrication frequency required.

- Lubricate with a high quality NLGI No. 2 or No.3 multi purpose ball bearing grease having rust inhibitors and anti-oxidant additives.

Some grease having these properties are:

- Shell - *Alvania EP No.2*
- Mobil - *Mobilux Ep2*
- Texaco - *Molytex No.2*
- Gulf - *Gulfcrown No. 2*
- American - *Amolith No. 2*

- Lubricate bearings prior to extended shutdown or storage and rotate shaft monthly to avoid corrosion.

Spherical Roller Bearings - Solid Pillow Blocks

SHAFT DIAMETER	Operating Speed (RPM)									
	500	1000	1500	2000	2200	2700	3000	3500	4000	4500
3/4" thru 1"	6	6	6	4	4	4	2	2	1	1
1 1/8" thru 1 1/4"	6	6	4	4	2	2	1	1	1	1
1 7/16" thru 1 1/2"	6	4	4	2	2	1	1	1	1	1/2
1 5/8" thru 1 3/4"	6	4	2	2	1	1	1	1	1/2	-
1" 15/16" thru 2"	6	4	2	1	1	1	1	1/2	-	-
2 3/16" thru 2 1/4"	6	4	2	1	1	1	1/2	-	-	-
2 7/16" thru 2 1/2"	4	2	1	1	1	1/2	-	-	-	-
2 11/16" thru 3"	4	2	1	1	1/2	-	-	-	-	-
3 3/16" thru 3 1/2"	4	2	1	1/2	-	-	-	-	-	-

- Lubricate with a multi-purpose roller bearing NLGI grade 2 grease having rust inhibitors, anti-oxidant additives, and a minimum oil viscosity of 500 SSU at 100°F. Some additives.

Some grease having these properties are:

- American - *Rykon No.2*
- Mobil - *Mobilgrease 28*
- Texaco - *Molytex Ep2 grease*

- Lubricate bearings prior to extended shutdown or storage and rotate shaft monthly to avoid corrosion.

RECOMMENDED 'SKF' GREASES FOR 'SKF' BEARINGS

Fixed Pillow Block - LGMT2 Fans running below 80°C (176°F)

Split Pillow Block - LGMT3 Fans running below 80°C (176°F)

Fans Running Above 80°C thru 150°C - LGHT3

TROUBLESHOOTING LIST

- IMPELLER** a. Loose on shaft
b. Unbalance
- DRIVE** a. Sheave not tight on shaft (motor or fan)
b. Belts hitting belt tube or belt guard
c. Belts too loose. Adjust for belt stretching after 48 hours of operation.
d. Belts too tight
e. Belts wrong cross-section
f. Belts not "Matched" in length on multi-belt drive
g. Variable pitch sheaves not adjusted so each groove has same pitch diameter (multi-belt drive)
h. Misaligned sheaves
i. Belts worn
j. Motor, Motor base or fan not securely anchored
k. Belts oily or dirty
l. Improper drive selection
m. loose key
n. Excessive start-stop cycles
- COUPLING** a. Coupling unbalanced, misaligned, loose or may need lubricant
b. Loose key
- BEARING** a. Defective bearing
b. Needs lubrication
c. Loose on bearing support
d. Loose on shaft
e. Seals misaligned
f. Foreign material inside bearing
g. Worn bearing
h. Fretting corrosion between inner race and shaft
i. Bearing not sitting on flat surface
j. Excessive belt tension
- SHAFT** a. Bent
b. Undersized
- MOTOR** a. Noisy motor bearings
b. Single phasing a three phase motor
c. Low voltage
- LOOSE FASTENERS** a. Impeller set screws
b. Bearing set screws
c. Drive component set screws
d. Fan mounting bolts
e. Bearing bolts
f. Motor bolts

BEA / BES SERIES

INSTALLATION INSTRUCTIONS

READ AND SAVE THESE INSTRUCTIONS

CAUTION

1. Avoid the risk of fire, electric shock or injury when installing, servicing or cleaning this equipment by unplugging or disconnecting from the power supply.
2. The fan must be ducted or guarded on the inlet and it is recommended to install a duct or fan guard/shutter on the air discharge when the fan is accessible.
3. Motor must be grounded.
4. Make sure the power source is compatible with the fan motor before installation.
5. Do not run fan propeller faster than specified fan RPM. Modification to fan speed significantly effects on the motor load and also it may effect on fan construction. If changes required contact factory.
6. While receiving, inspect all equipments and notify the carriers if any shipping damage found. Reversomatic is not held responsible for any physical damage found after acceptance.
7. Check all fasteners and set screws for tightness, specially bearing set screws before operation.
8. Rotation of the blade and air flow should be verified.
9. Bearings must be checked periodically and greased at least twice annually using a high-quality lithium based grease.
10. Check belt tension twice during the first 24 hours and periodically there after.
11. Installation of these unit and the corresponding electrical wiring must be done by a qualified person and be in accordance with all municipal and national codes and standards, including those related to fire rated construction.

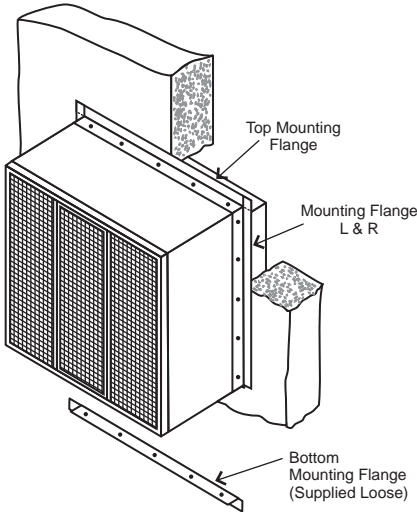
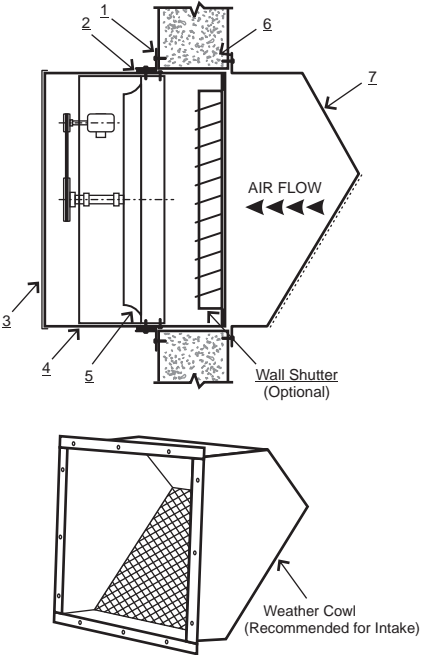
GUIDELINE FOR FIELD OVERLOAD PROTECTION INSTALLATION:

Motors with a marked service factor not less than 1.15	125%
Motor with a marked temperature rise not over 40°C	125% All
Other motors	115%

If a motor overload relay is used for motor protection, and the rating noted above results in tripping upon motor start-up, the relay may be one which is the next size larger than that noted above. However, the rating of the overload relay shall not exceed the following percentage of the motor full load current:

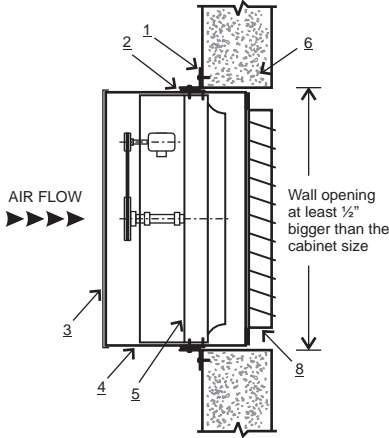
Motors with a marked service factor not less than 1.15	140%
Motor with a marked temperature rise not over 40°C	140%
Other motors	130%

INTAKE/SUPPLY



- LEGEND:**
- | | |
|-------------------------------|-------------------------------------|
| 1. MOUNTING FLANGE (Optional) | 5. VENTURI FRAME |
| 2. GASKET | 6. WALL |
| 3. HINGED GUARD | 7. WEATHER COWL |
| 4. CABINET | 8. BACK DRAFT DAMPER / WALL SHUTTER |

EXHAUST



NOTE:
It is recommended to install Mounting Flange on the Venturi Frame as shown.



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