



Maintenance & Operation Instructions

EB,CF, GPB, PW, PWS, QB, QCF, RI, SMP, TL, TLD, XL Fan Series

Introduction

This manual has been prepared to guide the users of Reversomatic Fans in the proper installation, operation and maintenance procedures to ensure maximum equipment life with trouble-free operation.

Receiving Inspection

When unit is received, check immediately for damage or missing parts. Check blade to see that it rotates freely. Report any damage to carrier. If fans are to be stored for a long period of time indoors or for any period of time outdoors, the customer will be responsible (unless specified in the order) to see that the proper precautions are taken to insure that the fans are protected.

Installation

Mounting support for the fans should be solid and level. If the mounting support is fabricated by the customer, it is important to make sure no members have a natural frequency of vibration at or near the fans operating speed. Mark and drill the bolt holes for the proper fan location. Location and bolt firmly in place. (See Installation Instruction)

Wiring

All motors supplied are plug-in style. Position of the wiring knock-out and removable wiring cover allows easy access for electrical connections. All electrical work must be done in accordance with local codes and ordinances.

Pre-Maintenance Operation

1. Check tightness of set screw blower wheel
2. Check blower wheel rotates freely
3. Check tightness of motor nuts
4. Apply power to the motor and check for proper rotational of the fan wheel
5. All Reversomatic motors have been designed with internal pockets allowing them to operate for five years without oiling. However, some Reversomatic motors are supplied with oilers. These are part of a standard motor casing used for various applications. Eliminating them would be an added expense. Although oiling is not a requirement, it certainly would not do any harm.

Periodic inspection once or twice a year should be made to determine if the unit is still soundly mounted. Loosening screws and nuts and accumulation of dust and dirt will impair its performance and put the unit out of balance. If this occurs, it is necessary to clean wheels and dirt build-up on the drive frame by simply brushing off.

Defective Motors

Should be returned to the nearest motor manufacturer authorized service center if defective within one year. (See our website or contact Reversomatic Manufacturing Limited.)

WARRANTY

REVERSOMATIC MANUFACTURING LIMITED WARRANTS IT WILL PROVIDE A REPLACEMENT PART OF ITS FANS FOUND TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP FOR A PERIOD OF ONE YEAR FOR COMMERCIAL FANS AND 2 YEARS FOR RESIDENTIAL FANS FROM DATE OF PURCHASE FOR FIRST USER, F.O.B. OUR PLANT. ECONOMY FANS ONE YEAR.

NOTE: THIS WARRANTY DOES NOT APPLY TO LABOR COSTS INVOLVED IN REPLACEMENT OR REINSTALLATION, DIAGNOSTIC SERVICE, CLEANING AND ADJUSTMENT OR TRANSPORTATION. FURTHERMORE WARRANTY IS ONLY APPLICABLE WHEN REVERSOMATIC REPLACEMENT PARTS AND ACCESSORIES ARE USED.



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.

CAUTION

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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INSTALLATION & MAINTENANCE GUIDE

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:

- a. Impeller hitting the inlet of the fan or cutoff plate, loose impeller.
- b. 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.
- c. If couplings are used they may be source of noise by being unbalanced, misaligned, loose or dry of lubricant.
- d. 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.
- e. 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.
- f. 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.**
- g. 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.

1. 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*

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	-	-	-	-	-	-

1. 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*

2. 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