



**NATIONAL  
FAN**  
C O M P A N Y

## **Models WPLC and REC Installation, Operation, and Maintenance Manual**



### **Direct Drive Centrifugal Exhausters Low Profile Roof/Sidewall and Roof Downblast**

#### **READ AND SAVE THESE INSTRUCTIONS**

The purpose of this manual is to aid in the proper installation and operation of fans sold by National Fan Company. These instructions are intended to supplement good general practices and are not intended to cover detailed instruction procedures, because of the wide variety and types of fans sold by National Fan Company.

# INSTALLATION, OPERATION AND MAINTENANCE MANUAL

## **INTRODUCTION:**

**DO NOT INSTALL, USE OR OPERATE THIS EQUIPMENT UNTIL THIS MANUAL HAS BEEN READ AND UNDERSTOOD. READ AND SAVE THESE INSTRUCTIONS FOR FUTURE USE.**

It is the responsibility of the purchaser to assure that the installation and maintenance of this equipment is handled by qualified personnel experienced in such work and equipment.

Contact your local representative should you need further information.

## **SHIPMENT AND RECEIVING:**

Prior to shipment, all fans have been thoroughly inspected and tested.

All equipment shipped from National Fan Company is skidded or crated to fully comply with trucking requirements. Inspect all shipments carefully for damage. **THE RECEIVER MUST NOTE ANY DAMAGE ON THE CARRIER'S BILL OF LADING AND FILE A CLAIM IMMEDIATELY WITH THE FREIGHT COMPANY, IN THE CASE OF ANY DAMAGE.** Keep a record of all equipment received, including inspection details and date of receipt, because of the possibility of partial shipments.

If you receive damaged goods, contact National Fan Company for repair or replacement service.

## **HANDLING:**

Handle your equipment with caution. Some fans are provided with lifting lugs or holes for easy handling. Others must be handled using nylon straps that protect the fan's coating and housing. Spreader bars should be used when lifting large parts.

Fans should be lifted by using straps around the fan housing only. **DO NOT LIFT FANS BY THE MOTOR, BASE, PROP, WHEEL, OR FLANGES.**

Roof ventilators should be lifted by using straps around the fan housing or base only. Spreader bars should also be used to avoid damage to stack caps or hoods. **DO NOT LIFT ROOF VENTILATORS BY THE STACK CAP OR HOOD.** On hooded units, disassemble the stack from hood when lifting. Upblast models may be lifted assembled.

## **STORAGE:**

If fans are stored for any length of time, they should be stored in a clean, dry location to prevent rust and corrosion. Outdoor storage is not recommended. When outdoor storage is necessary, they should be protected from the elements as best as possible. Cover the fan inlet and outlet and keep motors dry and clean.

For extended storage (more than 3 months), motor shafts should be rotated monthly. Storage records should be kept to assure proper maintenance. The factory can advise warranty centers to provide motor and bearing service if needed.

## **INSTALLATION:**

Roof ventilators should always be mounted to a flat level, solid and rigid structure. Particular caution should be exercised when installing fans on metal buildings. Be sure wall or roofs are capable of supporting the fan(s). Walls/ Roofs not supported correctly will cause vibration that could cause damage or injury.

Fans mounted off ground level should be rigidly mounted to a special platform and be placed as near as possible to, or over, a solid wall or column.

Supports for suspended fans must be crossbraced for live load support to prevent side sway.

Use guy wires to help secure roof units if excessively windy conditions prevail.

1. **CAUTION!** This fan contains rotating parts and requires special service. Appropriate safety precautions should be taken during installation, operation and maintenance.
2. **WARNING!** Do not install or operate this fan in an environment or atmosphere where combustible or flammable materials, gasses or fumes are present, unless it was specifically designed and manufactured for use in that environment. Explosion or fire can result. Explosive, corrosive, high temperature, etc. conditions may require special construction, inspection and maintenance. It is necessary to observe the fan manufacturer's recommendations and limitation concerning the type of material to be handled by the fan and its application in special conditions.
3. When ventilator is designed to be mounted on a curb, the curb should be securely installed prior to fan installation.
4. A damper, if used, should be securely mounted within the curb or wall in a manner that allows free and unobstructed operation.
5. **CAUTION!** All electrical work must be done in accordance with local and/or national electrical codes as applicable. If you are unfamiliar with methods of installing electrical wiring, secure the services of a qualified electrician.
6. **WARNING!** This product must be grounded.
7. **DANGER!** Make sure power is turned off and locked in the **OFF** position at the service entrance before installing, wiring or servicing fan.
8. **CAUTION!** Before wiring the motor, check the supply voltage against the motor nameplate voltage. High or low voltage can damage the motor and void the motor warranty.
9. **WARNING!** Be sure to keep all wiring clear of rotating or moving parts.
10. **WARNING!** Before starting the fan, turn the wheel to assure it rotates freely. If needed, adjust the wheel/shaft/motor position as required to achieve necessary clearances.
11. **WARNING!** Check all setscrews and keys. Tighten as necessary prior to fan startup.
12. On roof units, anchor the fan securely to the curb. Anchoring through the vertical portion of the curb cap flange is recommended. Use a minimum of four lag bolts or other suitable fasteners.
13. Due to the general nature of its applications, the basic air mover is available with protective guards and/or other devices for required operating safety as with most installations of rotating machinery. Before operating the basic unit in any of its applications determine requirements for such guards and/or devices needed for protection against accidental contact with moving parts or against injury to nearby personnel or critical equipment due to accidental rupture of fast moving parts.

### **START-UP:**

Lock out the power source.

Tighten all bolts and setscrews securely. **NOTE THAT ALL BOLTS AND SETSCREWS SHOULD BE TIGHTENED AFTER TWO DAYS OF INITIAL OPERATION.**

Clearance should be checked all around between wheel or propeller tips and the housing before starting up. The wheel or propeller should not strike the housing.

No initial lubrication is required. Motors have been pre-lubricated by motor manufacturer.

Arrows to show direction of rotation and airflow are attached to the fan housings.

After the electrical connections are completed, apply just enough power to start the impeller as indicated by the directional arrows on the unit. If the impeller is turning the wrong direction, it will not deliver rated airflow and the motor connections must be altered to correct rotation.

Lock out the power source before the installation of all accessories.

Fan electrical power can now be applied and special attention should be given to determine if motor is working properly. At this time, with air system in full operation, with guards attached, it is well for the electrician to measure the operating amperage of the motor and compare with the nameplate rating to determine that the motor is operating under safe load conditions.

The fan should not need balancing, as it was balanced at the factory to meet stringent vibration levels before shipment. However, there are several things that may cause vibration, such as rough handling in shipment and erection, weak foundations, and alignments.

### **MAINTENANCE:**

1. Before performing any maintenance on the fan, be sure power is turned off and locked in the OFF position at the service entrance before servicing the fan.
2. Ventilators should be carefully checked at least once a year. For critical or rugged applications, a routine check every two or three months is suggested.
3. All motors supplied with National Fan Company ventilators carry a one (1) year warranty from date of shipment. For repairs within the warranty period, the motor must be taken to the motor manufacturer's authorized service dealer. Contact your representative for additional warranty details.
4. A periodic motor check should consist of spinning the motor shaft with the power off to be sure the motor turns freely.
5. Check sheave set screws to ensure tightness. Proper keys must be in keyways.
6. Do not readjust blade pitch or fan RPM. If sheaves are replaced, use only sheaves of identical size and type.
7. During the first few months of operation, it is recommended that the setscrews be checked to assure they are tight.
8. The rotating wheel or propeller requires particular attention in most applications since materials in the air being handled can build up on the blades to cause destructive vibration; and may also corrode and/or erode the blade metal to weaken the structure of the propeller. Regular inspection and corrective action at intervals determined by the severity of each application are essential to good service life.

### **MOTORS:**

The fundamental principle of electrical maintenance is **KEEP THE MOTOR CLEAN AND DRY**. This requires periodic inspection of the motor. The frequency depends upon type of motor and the service.

We recommend periodic checks of voltage, frequency, and current of a motor while in operation. Such checks assure the correctness of frequency and voltage applied to the motor, and yield an indication of the fan load. Comparison of this data with previous data will give an indication of the fan performance. Any serious deviations should be investigated and corrected.

Lubricate integral horsepower motors per the motor manufacturer's recommendations. Lubrication frequency depends on the motor horsepower, speed, and service. Use compatible greases.

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2. A periodic motor check should consist of spinning the motor shaft with the power off to be sure the motor turns freely.

## **REPAIR PARTS:**

3. Fan Blades – Repair of individual fan blades or propeller assemblies is not recommended. Contact factory with blade size, number of blades, bore size, motor HP, air flow direction, rotation, fan RPM or sheave sizes and any order/tag information that is available for replacement.
4. Misc. Parts – Not available from local trade channels should be returned for repair or replacement. Be sure to obtain return tags or authorization before shipment.
5. Electric Motors – Repair or replacement of motors is normally performed by a repair station authorized by the manufacturer. Contact your representative or the factory for locations nearest to you. **DO NOT** ship motor to the factory without specific authorization.

## **FAN TROUBLE-SHOOTING CHART**

<b>PROBLEM</b>	<b>POSSIBLE CAUSES</b>
Excessive Vibration	Propeller, wheel or sheaves loose on shaft Out of balance propeller Excessive buildup of dirt/dust on propeller Bent shaft Weak mounting base for fan Fan mounting bolts loose Loose or worn bearings Bearing or drive misalignment Structures not crossbraced (wall fans) Curb not flat and level
Excessive Horsepower	Static pressure higher than design Wheel or propeller rotating in wrong direction Fan speed higher than design
Too Little Air	Restricted fan inlet or outlet Filters are dirty or clogged Wheel or propeller rotating in the wrong direction System is more restrictive (more static pressure) than expected Fan speed lower than design Inlet or Outlet screens clogged
Too Much Air	Filters not in place Fan speed higher than design System is less restrictive (less static pressure) than expected
Fan Does Not Operate	Wrong voltage Electricity turned off or note wired properly Blown fuses Overload protector has broken circuit
Excessive Noise	Propeller, wheel or sheaves loose Accumulation of material on propeller Worn or corroded propeller Wheel or propeller out of balance Wheel or propeller hitting housing Bent shaft Loose fan mounting bolts Rattle of components in high velocity airstream Electrical noise Noise from high velocity air system Vibrating parts not isolated from building Vibrating duct work

**WARRANTY:**

National Fan Company warrants this equipment to be free from defects in material and workmanship for five (5) years from date of shipment. Any units or parts which prove to be defective and are reported during the warranty period will be replaced at our option when returned to our factory, transportation prepaid. Deterioration or wear by heat, abrasive action, chemicals, improper installation or operation or lack of normal maintenance shall not constitute defects, and are not covered by warranty.

The motor is warranted by the motor manufacturer for one (1) year. If the motor becomes defective in the warranty period, it should be taken to the nearest authorized motor service station. If this is not done, the motor manufacturer will not warrant the motor. Call the factory for instructions if authorized service station is not known.

National Fan Company will not be responsible for any installation, removal or re-installation costs or any consequential damage resulting in failure to meet conditions of any warranty.

**LIMITATION OF WARRANTY AND LIABILITY**

This warranty does not apply to any such National Fan Company product or parts which have failed as a result of faulty installation or abuse, or incorrect electrical connections or alterations, made by others, or use under abnormal operating conditions or misapplication of the products and parts.

National Fan Company will not approve for payment any repairs made outside the factory without prior written consent of its Jacksonville, Florida office.

The foregoing shall constitute our sole and exclusive warranty and our sole and exclusive liability and is in lieu of all other warranties, whether written, oral, implied or statutory. There are no warranties which extend beyond the description of the page hereof. Seller does not warrant that said goods and articles are of merchantable quality or that they are fit for any particular purpose. The liability of seller on any claim of any kind, including negligence, for any loss or damage arising out of or connected with, or resulting from the sale and purchase of the products and parts covered by this proposal, acknowledgement, order or from the performance or breach of any contract pertaining to such sale or purchase, or from the design, manufacture, sale, delivery, resale, installation, technical direction of installation, inspection, repair, operation or use of any products or parts covered by this proposal, acknowledgement, order or furnished by seller shall, in no case exceed the price allocable to the products or parts thereof which give rise to the claim and shall terminate one (1) year after the shipment of said products and parts.

In no event, whether as a result of breach of contract, or warranty or alleged negligence, defects, incorrect advice or other causes, shall seller be liable for special or consequential damages, including, but not limited to, loss of profits or revenue, loss of use of the equipment or any associated equipment, cost of capital, cost of substitute equipment, facilities or services, down time costs, or claims of customers of the purchaser for such damages. National Fan Company neither assumes nor authorizes any persons to assume for it any other liability in connection with the sale of its fan products and parts. Some states do not allow the exclusion or limitation of incidental or consequential damages, so all of the above limitations or exclusions may not apply to you.

**SAFETY ACCESSORIES WARNING:**

The responsibility for providing safety accessories for equipment supplied by National Fan Company is that of the installer and user of this equipment. National Fan Company sells its equipment with and without safety accessories, and accordingly it can supply such safety accessories upon receipt of order.

The user, in making its determination as to the appropriate safety accessories to be installed and any warning notices, should consider (1) the location of the installation, (2) the accessibility of employees and other persons to this equipment, (3) any adjacent equipment, (4) applicable building codes, and (5) requirements of the Federal Occupational Safety and Health Act. Users and installers of this equipment should read "RECOMMENDED SAFETY PRACTICES FOR AIR MOVING DEVICES" which is published by Air Movement and Control Association, 30 West University Drive, Arlington Heights, Illinois 60004.