

NATIONAL FAN COMPANY

INSTALLATION, SAFETY, OPERATING AND MAINTENANCE INSTRUCTIONS

HADP CAST ALUMINUM BLOWERS ADB CAST ALUMINUM BLOWERS

WARNING

BY ACCEPTANCE OF THIS MERCHANDISE, THE PURCHASER AND USER
ASSUME COMPLETE RESPONSIBILITY UNLESS UNIT IS OPERATED IN
COMPLIANCE WITH ALL FEDERAL AND LOCAL LAWS AND REGULATIONS.

ROTATING EQUIPMENT MUST BE PROPERLY GUARDED TO PREVENT PERSONAL INJURY

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RECEIVING & START-UP INSTRUCTIONS

Receiving Inspection:

When unit is received, inspect immediately for damaged or missing parts. Even though all units are carefully inspected and prepared for shipment at the factory, rough handling enroute may cause concealed damage or cause nuts or bolts to work loose. Check wheel to see that it rotates freely and that there are no obstructions. Be certain all bolts and locking collars are tightened securely.

If concealed damage is found, call the carrier and ask for their Inspection Department. Then fill out a concealed damage inspection report.

Unpacking:

Be careful not to damage or deform any parts of the blower when removing it from the packaging container. All the packaging material should be kept in the event the blower needs to be returned.

Handling:

Handling of the blower should be performed by trained personnel and be consistent with all safe handling practices. Verify that all lifting equipment is in good operating condition and has the proper lifting capacity. The blower should be lifted using well-padded chains, cables or lifting straps with spreader bars. **NEVER lift the blower by an inlet or discharge flange, motor shaft, motor eye bolt, or any other part of the blower assembly that could cause distortion of the blower assembly.**

Installation:

Blowers should always be mounted to a flat, level and rigid structure. Shim the blower where necessary. This will ensure permanent alignment and a smooth running, vibration free blower, as well as minimize maintenance costs.

Poured concrete foundations are recommended, wherever practical, for floor mounted blowers.

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

Before any mounting method is selected the user should be aware of the effects vibration will have on the blower, motor and other parts. Improper blower installation can cause excessive vibration causing premature wheel and/or motor bearing failure that is not covered under warranty. Vibration eliminator pads, springs or bases should be properly installed to prevent any blower vibration from transmitting to the foundation, support structure or ducting.

Sound:

Some blowers can generate sound that could be hazardous to personnel. It is the responsibility of the user to measure the sound levels of the blower and/or system, determine the degree of personnel exposure, and comply with all applicable safety laws and requirements to protect personnel from excessive noise.

Air Pressure and Suction:

In addition to the normal dangers of rotating machinery, the blower can present additional hazards from the suction or pressure created at the blower inlet or discharge. Suction at the blower inlet can draw materials into the blower where they become high velocity projectiles at the discharge and can cause severe personal injury or death. It can also be extremely dangerous to persons in close proximity to the inlet or discharge as the forces involved can overcome the strength of most individuals.

Safety Accessories:

Guards: All moving parts must be guarded to protect personnel. Safety requirements can vary, so the number and types of guards required to meet company, local, state and OSHA regulations must be determined and specified by the actual user or operator of the equipment.

NEVER start any blower without having all required safety guards properly installed. All blowers should be checked on a regular schedule for missing or damaged guards. If any required guards are found to be missing or defective, the power to the blower should be immediately turned off and locked out in accordance with OSHA regulations. Power to the blower should NOT be turned back on until the required guards have been repaired or replaced.

This blower can become dangerous due to a potential “windmill” effect, even though all electrical power has been turned off or disconnected. The blower wheel should be **carefully** secured to prevent any rotational turning **BEFORE** working on any parts of the blower/motor assembly that could move.

OPERATION

Before Start-Up:

1. Inspect all fasteners to make sure they are secure.
 - A. Foundation bolts
 - B. Set screws in blower wheel
 - C. Housing and motor mounting bolts
2. Turn rotating assembly by hand to insure that it does not strike housing. If the wheel strikes the housing, the wheel may have sustained damage or moved on the shaft. Correction must be made before start up.
3. Check motor to insure proper speed and electrical characteristics.
 - A. When making electrical connections ensure that a qualified electrician adheres strictly to the wiring diagram on the motor nameplate or in the motor terminal box. Special attention should be given to being sure that a single phase motor is connected only to a single phase supply of proper voltage, and that a three phase motor will only operate on a three phase supply. Electric motors will burn out and fail immediately if improperly connected. It is also recommended that in every motor connection an overload device be installed between the current supply and the motor to protect the motor from under voltage conditions and motor overloads.

Duct Work Connections:

All duct connections to the blower should include **flexible** connectors between the ducting and the blower inlet and/or discharge. This will eliminate distortion, noise and vibration from transmitting to the duct and building. The connectors should be selected to handle the

operating conditions for air volume and pressure that the blower will produce. **All ducting or accessories, added by the user, should be independently supported. DO NOT use the blower/motor assembly to support any additional weight.** Inlet and/or discharge duct elbows should be located a minimum of 2 blower wheel diameters from the blower. Any duct elbows located closer than 2 wheel diameters to the blower inlet or discharge **WILL** reduce the air performance and blower efficiency.

Non-Ducted Blower Inlet:

Any blower with no ducting on the inlet must have an inlet guard. The blower should be located so the blower inlet is, at least, 1 wheel diameter away from any wall or bulkhead to eliminate a reduction in air flow.

Non-Ducted Blower Discharge:

Any blower with no ducting on the discharge **must** have a discharge guard.

Start-Up

1. "Jog" the motor to check proper wheel rotation. The motor should be started in accordance with the manufacturer's recommendations. Arrows on blower indicate the proper direction of rotation and airflow.
2. Blower may now be brought up to speed. Watch for anything unusual such as vibration, overloading of bearings and motors, etc.
3. Check motor amperage against nameplate amperage to ensure motor is not overloading.

GENERAL MAINTENANCE

CAUTION: Before any maintenance or service is performed, be sure that unit is disconnected from power source to prevent accidental starting.

Periodic inspection of all the blower parts is the key to good maintenance and trouble free operation. Frequency of inspection must be determined by the user and is dependent upon the severity of the application.

NEVER SERVICE OR ADJUST ROTATING EQUIPMENT WHILE IT IS OPERATION. LOCK OUT THE POWER SOURCE BEFORE PERFORMING MAINTENANCE.

Regular blower maintenance should include the following:

CAST ALUMINUM & METAL PARTS

- A. Cast aluminum and steel parts usually do not require maintenance during the life of the unit except painted metal surfaces that require periodic repainting. In a severe, dirty operation, the wheel should be cleaned with a wire brush to prevent an accumulation of foreign matter that could result in blower unbalance. After cleaning wheel, inspect for possible cracks or excessive wear, which can cause unbalance. **DO NOT** operate a wheel that is cracked, chipped, broken blades or excessive wear.

NOTE: If wheel set screws are loosened and/or wheel is removed from shaft, set screws must be replaced. Set screws cannot be used more than once.

MOTOR MAINTENANCE

1. **DO NOT** connect or operate a motor without reading the motor manufacturer's instructions supplied with the blower. The basic principle of motor maintenance is: **KEEP THE MOTOR CLEAN AND DRY.** This requires periodic inspections of the motor. The

frequency of the inspections depends on the type of motor, the service and environment it will be subjected to and the motor manufacturer's instructions.

2. **Cleaning:** Cleaning should be limited to exterior surfaces only. **Follow motor manufacturer's cleaning instructions.**

3. **Lubrication:** Most small motors have sealed bearings that are permanently lubricated for the life of the motor. Some larger motors have grease plugs that should be replaced with grease fittings to perform re-lubrication. These motors, or any motor with grease fittings, should be lubricated in accordance with the motor manufacturer's recommendations. Lubrication frequency depends on the motor horsepower, speed and service. **BE SURE** you use compatible grease and **DO NOT** over grease.

4. **Wiring Connections:** All wiring connections should be made for the proper voltage and phase as shown on the motor nameplate. Connections should follow the motor manufacturer's recommendations as shown on the wiring schematic. This wiring diagram will be located on the outside of the motor, inside of the motor conduit box or on the motor nameplate. **Reversing some wires might be necessary to get the correct blower rotation.**

5. **Normal Motor Operating Temperatures:** Using your hand to test the normal running temperature of a motor can be a very painful experience. **The normal operating temperature of a fully loaded, open type, electric motor operating in a 70° F. (21° C.) ambient temperature is 174° F. (79° C.)**

6. **Maximum Blower Speed and Motor Speed Controllers:** If you will be using any type of motor speed controller with this blower, **DO NOT** exceed the **maximum safe blower speed**. Installing and using a speed control device requires special training and certification as required by the speed control manufacturer. See the manufacturer's instructions for proper use, installation and wiring connections for the maximum speed settings. It may also be necessary to "block out" some speeds to eliminate a resonant vibration problem.

ORDERING REPLACEMENT PARTS

Replacement or spare parts may be ordered through your local National Fan representative or directly from National Fan in the event there is no local representative.

The following information should accompany part orders:

1. Motor horsepower, frame size, and motor speed. If motor is to be replaced, furnish voltage, phase, cycle, and enclosure and model number from motor nameplate.
2. Blower speed (if V-belt driven)
3. Serial numbers, model numbers and complete description of the part.

SAFETY ACCESSORIES WARNING

The responsibility for providing safety accessories for equipment supplied by National Fan is that of the installer and user of this equipment. National Fan 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
5. Requirement of the State Bureau of Safety & Health and Federal Occupational Safety and Health Act.

TROUBLE SHOOTING

PROBLEM	CAUSE
Motor Overheating	<p>NOTE: A normal motor will operate at 174° F.</p> <ol style="list-style-type: none"> 1. Actual system static pressure (SP) is lower than expected. 2. Voltage supplied to motor is too high or too low. 3. Motor speed (RPM) too high or defective motor. 4. Air density higher than expected. 5. Motor wired incorrectly or loose wiring connections. 6. Cooling fan cover on back of motor is clogged. (Fan cooled motors only.)
Excessive Noise	<ol style="list-style-type: none"> 1. Wheel rubbing inside of housing. 2. Worn or corroded blower wheel. 3. Accumulation of foreign material on blower wheel. 4. Loose mounting bolts, wheel set screws, or taper-lock hubs. 5. Bent motor shaft. 6. Worn motor bearings. 7. Motor out of balance. 8. Motor bearings need lubrication. 9. Vibration originating elsewhere in system. 10. System resonance or pulsation. 11. Inadequate or faulty design of blower support structure. 12. Blower operating near “stall” condition due to incorrect system design or installation.
Blower Doesn't Operate	<ol style="list-style-type: none"> 1. Motor wired incorrectly. 2. Incorrect voltage supply. 3. Defective fuses or circuit breakers. 4. Power turned off elsewhere. 5. Motor wired incorrectly or loose wiring connections. 6. Defective motor.
Excessive Vibration	<ol style="list-style-type: none"> 1. Loose mounting bolts, wheel set screws, taper-lock hubs. 2. Worn or corroded blower wheel. 3. Accumulation of foreign material on blower wheel. 4. Bent motor shaft. 5. Worn motor bearings. 6. Motor out of balance. 7. Inadequate structural support. 8. Support structure not sufficiently cross braced. 9. Weak or resonant foundation. 10. Foundation not flat and level.
Airflow (CFM) Too Low	<ol style="list-style-type: none"> 1. Blower wheel turning in wrong direction (rotation). 2. Actual system static pressure (SP) is higher than expected. 3. Motor speed (RPM) too low. 4. Dampers or valves not adjusted properly. 5. Leaks or obstructions in duct work. 6. Filters dirty. 7. Inlet and/or discharge guards are clogged. 8. Duct elbow too close to blower inlet and/or discharge. 9. Improperly designed duct work.
Airflow (CFM) Too High	<ol style="list-style-type: none"> 1. Actual system static pressure (SP) is lower than expected. 2. Motor speed (RPM) too high. 3. Filter not in place. 4. Dampers or valves not adjusted properly.

LIMITED WARRANTY

National Fan Company warrants the products and parts it manufactures (“National Fan Products and Parts”) against defects in material and workmanship under normal use and conditions for the lesser of eighteen (18) months from the date of shipment or twelve (12) months from the date of installation (the “Warranty Period”). This warranty does not apply to repairs or replacement necessitated by any cause beyond the control of National Fan including, but not limited to any malfunction, defects or failures which, in the opinion of National Fan, are caused by or resulting from: faulty installation, unauthorized service or parts, Buyer’s faulty or negligent assembly of components, the negligence of Buyer or its employees or agents, any alteration or modification of National Fan Products or Parts, over-loading, incorrect electrical connections, use under abnormal operating conditions, misapplication of National Fan Products or Parts, improper maintenance, operation contrary to furnished instructions, shipping or transit accidents, modification or repair by Buyer, abuse, misuse, neglect, accident, fire, flood, or other acts of God, incorrect line voltage, or normal wear and tear. Expenses incurred by Buyer in repairing or replacing any defective National Fan Products or Parts will not be paid by National Fan unless authorized in advanced in writing signed by an authorized officer of National Fan.

In the event a defect in material or workmanship relating to National Fan Products or Parts is found during the warranty period, buyer shall immediately notify National Fan and request a written return authorization for the allegedly defective material. Return of such material shall be at the buyers’ sole cost and expense (all shipping and transportation expenses to be paid by the buyer). National Fan assumes no responsibility for any material returned to its plant without written authorization of an officer of National Fan.

The Warranty contained herein is in lieu of all other warranties, express or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. Buyer agrees that National Fan liability and Buyer’s sole and exclusive remedy pursuant to any claim of any kind, including but not limited to a claim in contract, tort, negligence or strict liability shall be, at National Fan’s option, the repair, replacement of, or award of a credit from National Fan to Buyer in the amount of the original purchase price for any National Fan Product or Part which is determined by National Fan to be defective. Under no circumstances shall National Fan or any of its affiliates have any liability whatsoever for any compensatory, punitive, special, indirect, incidental or consequential damages, including, without limitation, lost profits or revenues, loss of use, lost production or claims of third parties against Buyer, even if National Fan has been advised of the possibility of such damages.

Concerning products or parts furnished by, but not manufactured by National Fan, such as motors, National Fan expressly limits its liability to any warranties extended by the manufacturer of such product or part, which National Fan will pass through to Buyer.